



# Environment and Natural Resources Trust Fund

## 2024 Request for Proposal

### General Information

**Proposal ID:** 2024-204

**Proposal Title:** Innovative Solution to Renewable Energy from Food Waste

### Project Manager Information

**Name:** Bill Keegan

**Organization:** Dem-Con

**Office Telephone:** (952) 224-7102

**Email:** billkeegan@dem-con.com

### Project Basic Information

**Project Summary:** A private-public partnership supporting the State climate and renewable energy goals by diverting organics from landfills and producing Renewable Natural Gas (RNG) from anaerobic digestion and sequestering carbon into biochar.

**Funds Requested:** \$10,000,000

**Proposed Project Completion:** December 31, 2025

**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?**

Region(s): Metro, SW,

**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.**

The connection between food loss, waste, and climate change is increasingly recognized as impactful on our environment. According to the USDA, food loss and waste embodies 170 million metric tons of carbon dioxide (CO<sub>2</sub>) equivalent GHG emissions annually. Production, transportation, and handling of food generates significant CO<sub>2</sub> emissions and when the food ends up in a landfill, it generates methane.

“Climate change impacts lives and livelihoods in every corner of our state. Minnesota will continue to lead the way on combatting climate change and we’ll create clean energy jobs in the process...” - Governor Walz, Feb 2023.

“Climate change threatens many of the things we love most about our state – which is why we’re going to lead Minnesota to 100% clean electricity by 2040,” - Lieutenant Governor Peggy Flanagan, Feb 2023.

The transportation sector is one of the largest contributors to GHG emissions and accounted for the largest portion (28%) of total U.S. GHG emissions in 2018.

The opportunity is to invest in programs and infrastructure that will reduce our reliance on fossil fuels and decrease CO<sub>2</sub> emissions. This proposal leverages an innovative process, private-public partnerships, long-term contracts, and private funding, to the long-term benefit of the State.

### **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.**

We are proposing a unique private-public partnership with Ramsey and Washington counties in collaboration with the Shakopee Mdewakanton Sioux Community to provide renewable energy, reduce GHG emissions, sequester carbon, and produce a valuable soil amendment while helping Minnesota meet our climate change and circular economy goals. This innovative approach produces RNG through anaerobic digestion of food waste/organics and a biochar which sequesters carbon and is used in compost as a soil amendment helping to achieve the state climate change initiatives.

The digester will process 70,000 tons of organic waste creating 170,000 MMBtu of RNG per year, 10,000 tons of biochar, and reducing over 10,000 tons per year of CO<sub>2</sub>e. In addition to all the indirect emission reductions, the direct emission reduction is equivalent to removing 2,155 passenger vehicles from the road each year.

Dem-Con completed an end-markets feasibility study demonstrating ample demand for RNG and biochar. In addition, CenterPoint Energy has selected this project as one of the top preferred projects as part of the Innovation Plan being developed as part of the Natural Gas Innovation Act.

The proposed project is a critical step toward developing a sustainable circular economy for Minnesota.

### **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?**

This proposal provides a unique opportunity to establish a new waste management strategy and shift the paradigm on managing waste in Minnesota beyond landfilling. The project will reduce GHG emissions, provide a renewable energy source, and sequester carbon helping to meet our 75% recycling by 2030 goal and our 100% Clean Energy by 2040 goal. This project will demonstrate and verify a process that can then be replicated and used throughout the State of Minnesota improving the quality of human health, the environment, and our state natural resources. However, given the significant capital investment, these AD projects require financial assistance.

## Activities and Milestones

### Activity 1: Design, Engineer, and Permitting of an Anaerobic Digestion and Pyrolysis System

**Activity Budget:** \$1,000,000

**Activity Description:**

The proposed anaerobic digestion and pyrolysis system will be designed to process up to 70,000 tons of organic waste (50,000 from Ramsey and Washington counties) creating 170,000 MMBtu of RNG per year, 10,000 tons of biochar, and reducing over 10,000 tons per year of CO2 equivalent. The facility will be located at the Dem-Con Environmental Campus in Shakopee, Minnesota which is already permitted as a solid waste processing and disposal site. The existing facility permits would need to be modified to include the processing of organic food waste and the production of RNG and biochar. Dem-Con has met with the MPCA and they are supportive of the project and the required permit modifications needed at the state level. The equipment would include a high-solids Kompogas® plug-flow digester produced by Hitachi-Zosen Inova, a High-Temperature Pyrolysis (HTP) unit, and associated conveyance systems, storage, cleanup, and RNG compression systems.

**Activity Milestones:**

Description	Approximate Completion Date
Design and Engineering of Anaerobic Digestion and Pyrolysis System	December 31, 2024
Permitting (State, County, & Township)	December 31, 2024

### Activity 2: Procure and Construct Anaerobic Digester and Pyrolysis System

**Activity Budget:** \$9,000,000

**Activity Description:**

Dem-Con/HZI would procure and construct a high solids Kompogas® plug-flow digester which converts the organics into a high-quality Renewable Natural Gas (RNG) and a High Temperature Pyrolysis (HTP) system to sequester carbon into a biochar soil amendment. This stage of development includes site development, building planning, equipment procurement, construction, and commissioning of the equipment. In addition, the existing CenterPoint natural gas pipeline infrastructure will be extended to the project location along with construction of the pipeline interconnect infrastructure. CenterPoint has performed a detailed engineering assessment of the project and has confirmed the ability to extend infrastructure to the site and that they have ample year-round demand for the RNG that will be produced. Additionally, CenterPoint Energy has selected this project as one of the top preferred projects as part of the Innovation Plan being developed as part of the Natural Gas Innovation Act.

**Activity Milestones:**

Description	Approximate Completion Date
Site work	September 30, 2024
Equipment Procurement	December 31, 2024
RNG Pipeline and Gas Interconnect Construction	June 30, 2025
Building Construction	June 30, 2025
Equipment Installation and Commissioning	December 31, 2025

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Thomas Gratz	Hitachi Zosen Inova, U.S.A. LLC	Equity partner, equipment and technology provider.	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 unique public-private partnership, along with a 20-year operating contract, provides long-term stability and funding ensuring the success of the project. Dem-Con/HZI is committed to the success of this project and pioneering a new waste management strategy for Minnesota. We are funding over 85% of the project costs enabling LCCMR to leverage their allocated grant money for the maximum benefit of the State. This project will demonstrate and verify a process that can then be used throughout the State to reduce our reliance on fossil fuels and improve the quality of human health, the environment, and our natural resources.

## Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Innovative Solution for Protecting Minnesota from PFAS Contamination	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 04f	\$250,000

## Project Manager and Organization Qualifications

**Project Manager Name:** Bill Keegan

**Job Title:** President

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

Bill Keegan, P.E. is a registered professional engineer and president of Dem-Con Companies, a third-generation family-owned solid waste management and processing company. Bill is actively involved in business development and the management of the Dem-Con facilities including the proposed anaerobic digester, a C&D Material Recovery Facility (MRF), single stream MRF, shingle and metals processing, C&D and industrial waste disposal facilities and roll-off dumpster services throughout Minnesota. He has been in the solid waste industry for over 26 years and is active in several solid waste organizations including a current position as the chair of the Minnesota chapter of the National Waste & Recycling Association (NWRA), NWRA Recycling Committee Chair, Board Member for the Minnesota Chamber of Commerce, Chair of the Minnesota Waste Wise Board; Recycling Association of Minnesota (RAM) Advisory Council, SWANA MOLO Instructor, and an instructor for the Minnesota landfill operator training program. He has led the anaerobic digester business development, technology and end market research, and project development over the past five years.

**Organization:** Dem-Con

**Organization Description:**

Dem-Con Companies (Dem-Con) is a third-generation family owned business that has been providing waste disposal, recycling, and processing solutions to the community since the 1960s. Dem-Con has continued to evolve toward more processing and recycling, leading the industry toward a more sustainable approach to solid waste management system.

One example of this sustainability evolution is the development of our “Environmental Campus” of processing and recycling operations diverting waste from landfills. The Dem-Con Environmental Campus consists of a Construction and Demolition (C&D) recycling facility, shingle recycling facility, wood recycling facility, metals scrap and recycling yard, a single-stream (mixed curbside recyclables) recycling facility, organic food waste separation, and the proposed renewable energy food waste digester. Dem-Con has been recognized as a leader in the industry receiving several awards from the National Waste and Recycling Association (NWRA) for Recycling Facility of the Year, the Recycling Association of Minnesota (RAM) for Recycler of the Year, the Solid Waste Association of North America (SWANA) award for Gold Excellence in Recycling Systems, and we received the Minnesota Governors Award for Pollution Prevention.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
							<b>Sub Total</b>	-
<b>Contracts and Services</b>								
Engineering Consultants	Professional or Technical Service Contract	Solid Waste and Air Permitting, Civil, Structural, Electrical, Mechanical, Procurement, associated with project development. Identification of potential feedstocks and end markets, assistance with off-take agreements, EPC budget and contract review, construction project oversight.				20		\$750,000
Hitachi Zosen Inova, U.S.A LLC	Professional or Technical Service Contract	Project commissioning				0.5		\$250,000
CenterPoint Energy	Professional or Technical Service Contract	Extension of gas pipeline to project location and interconnect to accept Renewable Natural Gas into CenterPoint Energy pipeline.				5		\$4,000,000
							<b>Sub Total</b>	<b>\$5,000,000</b>
<b>Equipment, Tools, and Supplies</b>								
	Equipment	Anaerobic digester, pyrolysis unit, gas cleanup equipment, and associated unloading/receiving areas, bunker storage areas, load out area, control room & scale office.	Equipment processing of food waste					\$5,000,000
							<b>Sub Total</b>	<b>\$5,000,000</b>
<b>Capital Expenditures</b>								
							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								

							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
							<b>Sub Total</b>	-
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								
							<b>Sub Total</b>	-
							<b>Grand Total</b>	\$10,000,000

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
<b>State</b>				
			<b>State Sub Total</b>	-
<b>Non-State</b>				
In-Kind	As a progressive leader in the industry, Dem-Con/HZI is committed to the success of this project and pioneering a new waste management strategy for Minnesota. We are funding over 85% of the project costs with private capital enabling LCCMR to leverage their allocated grant money for the maximum benefit of the State. However, given the extensive capital investment additional grant money from LCCMR is needed to enable this project to succeed in a competitive waste management environment.	The funds will be used for the construction of an anaerobic digester, pyrolysis unit, building, professional services, design, engineering, and construction, This project will demonstrate and verify a process that can then be used throughout the State to reduce our reliance on fossil fuels and improve the quality of human health, the environment, and our natural resources.	Secured	\$65,369,000
			<b>Non State Sub Total</b>	<b>\$65,369,000</b>
			<b>Funds Total</b>	<b>\$65,369,000</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [8fd8d8b4-207.pdf](#)

#### *Alternate Text for Visual Component*

Private public partnership with Ramsey and Washington Counties, in collaboration with the Shakopee Mdewakanton Sioux Community, for the anaerobic digestion of organic food waste into renewable natural gas (RNG) and sequestering carbon into biochar which can be used as a soil amendment in compost operations completing a circular economy....

### Optional Attachments

#### *Support Letter, Photos, Media, Other*

Title	File
Washington County Letter of Support	<a href="#">c2cfbf4a-e9d.pdf</a>
Recycling & Energy Letter of Support	<a href="#">0d41b6ce-bbe.pdf</a>
Background Check Certification - Dem-Con	<a href="#">a8174623-8ac.pdf</a>
CenterPoint Energy Letter of Support	<a href="#">39a6f4d1-d4e.pdf</a>
Shakopee Mdewakanton Sioux Community Letter of Support	<a href="#">c04fc902-9b2.pdf</a>
Ramsey County Letter of Support	<a href="#">c01dc6ce-aff.pdf</a>

## 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?**

No

**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