

**Environment and Natural Resources Trust Fund  
2010 Request for Proposals (RFP)**

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**LCCMR ID: 063-B2**

**Project Title:**

Methane from Waste for Clean Energy and Environment

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**LCCMR 2010 Funding Priority:**

B. Renewable Energy Related to Climate Change

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**Total Project Budget: \$** \$292,000

**Proposed Project Time Period for the Funding Requested:** 2 years, 2010 - 2012

**Other Non-State Funds: \$** \$106,000 pending

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**Summary:**

We will develop digester management guidance, provide studies of environmental and economic impact of widespread anaerobic digester implementation, and educate farm, community, business, and municipal waste leaders of digester opportunities.

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**Sponsoring Organization:** The MN Project

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**Location:**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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_____ Knowledge Base	_____ Broad App.	_____ Innovation
_____ Leverage	_____ Outcomes	
_____ Partnerships	_____ Urgency	_____ TOTAL

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# MAIN PROPOSAL

## Methane from Waste for Clean Energy and Environment

### I. PROJECT STATEMENT

Minnesota's air, water, and soil face growing demands to provide for our needs. Yet, they also face growing threats of nutrient and pathogen runoff or deposition into waters, harmful gas releases, and greenhouse gas emissions, all brought on by improper waste management. Anaerobic digesters have the potential to address these issues by extracting methane, making it available for producing electricity, and by heating waste to destroy many pathogens. Digesters effectively destroy over 95% of pathogens present in animal manure while also transforming nutrients, reducing their runoff potential. Only a handful of Minnesota wastewater treatment facilities use digesters to improve their waste treatment process. Numerous industrial and processing facilities in Minnesota have organic by-products currently being deposited into landfills. Also, almost one-quarter of all consumer waste is organic. Unfortunately, few people are fully aware of the potential of digesters. Moreover, standards and information to guide digester operation do not yet exist, especially for Minnesota's unique climate and environment.

Overall goals of the project include: creation of baseload renewable electricity to offset fossil fuel use; reduction of greenhouse gas emissions; and reduction of pathogens, phosphorous, and nitrates in surface and ground water. The Minnesota dairy industry holds vast potential as a clean energy source. With the methane from 5 cows able to provide all of the electricity needs for 1 home, implementing digesters on the roughly 1,100 dairy farms adequately sized to implement digesters, or about one out of every three dairy farms, could provide all of the electricity needs for over 96,000 Minnesota homes. Add to that the potential to implement digesters at hundreds of food processing facilities, within hundreds of communities, and at hundreds of municipal waste facilities, and Minnesota could meet a considerable portion of its energy needs through this renewable source. To achieve the project goals, participants will conduct the following activities: develop a digester management guide; provide education to farmers, businesses, communities, and waste managers; create a digester products and services directory; analyze the environmental and economic impacts of digesters; and convene a conference to educate, open communication, and catalyze implementation in Minnesota.

### II. DESCRIPTION OF PROJECT RESULTS

**Result 1: Develop a Digester Guidebook through a technical advisory committee and public forums to improve digester operational effectiveness and increase clean energy production. Budget: \$ 82,500**

Project partners will convene a panel of experts on the science, ecological impacts/needs, engineering, operation, and economics of digesters to develop a preliminary guidebook that, when followed, will increase digester effectiveness. We will conduct 6 public forums across the state to obtain feedback for the editing process and begin educating interested stakeholders. We will then publish the final version of the guidebook and make it available to stakeholders.

#### Deliverables

1. Convening of Technical Advisory Panel to develop digester guidebook.
2. Convening of 6 public forums on digester guidebook.
3. Publication and dissemination of digester guidebook.

#### Completion Date

October 2010  
June 2011  
August 2011

**Result 2: Define the impact of digesters on the Minnesota economy and environment to lay the roadmap for integration. Budget: \$73,500**

To provide deeper information and analysis into the potential impact of anaerobic digesters, project partners will conduct three studies projecting the future impacts that wide-scale anaerobic digester implementation would have on the Minnesota environment and economy.

<b>Deliverables</b>	<b>Completion Date</b>
1. Conduct Minnesota feedstock capacity/feasibility study.	December 2010
2. Conduct potential Environmental Impact Analysis of digesters.	March 2011
3. Conduct Economic Impact Analysis of widespread digester implementation.	October 2011

**Result 3: Increase clean energy production and waste management effectiveness by educating and assisting farmers, communities, and waste managers to integrate digesters. Budget: \$136,000**

Through digester planning and feasibility workshops project partners will work with parties interested in digesters to develop plans for advancing projects. Project partners will develop a map-based digester products and services directory website to help overcome difficulties with finding product and service providers in the new industry. To provide guidance to parties just beginning to study digester opportunities, The Minnesota Project will maintain digester information on its website. Partners will plan a digester conference designed to bring together 200+ researchers, representatives from state and local government as well as community and environmental groups, and those interested in learning more and/or considering adding a digesters to their farm, community, or waste management process in order to open communication among participants, educate and inform, and strategize next steps for digester implementation.

<b>Deliverables</b>	<b>Completion Date</b>
1. Develop and maintain a digester products and services directory.	November 2011
2. Conduct 5 digester education and planning workshops.	May 2012
3. Publish study results and digester guidebook on Minnesota Project website and provide visitors contact information to answer digester questions.	January 2012
4. Conduct a digester conference for 200+ participants.	March 2012

**III. PROJECT STRATEGY**

**A. Project Team/Partners:** The Minnesota Project will provide overall project management, including the convening of the Technical Advisory Group and public forums, development of impact studies, the dissemination of the Digester Guidebook, convening of a digester conference and development of a digester products and services directory. Agricultural Utilization Research Institute will provide feasibility analysis to potential digester operators and lead or assist in digester planning and feasibility workshops. Minnesota Milk Producers Association will provide outreach to dairy producers and provide support on the digester conference.

**B. Timeline Requirements:** 2 years

**C. Long-Term Strategy:** This project is part of a long-term strategy that includes propelling clean energy and environmental improvement through market-based solutions and making Minnesota the center of the clean energy economy.

## Project Budget

### IV. TOTAL PROJECT REQUEST BUDGET (2 years)

<b>BUDGET ITEM</b> <i>(See list of Eligible &amp; Non-Eligible Costs, p. 13)</i>	<b>AMOUNT</b>
The Minnesota Project Clean Energy Program Manager (.5 FTE), will manage the project and coordinate the Technical Advisory Committee and public forums, and coordinate and write the capacity, environmental, and economic impact studies.	\$ 84,000
The Minnesota Project Clean Energy Program Associate (.33 FTE), to establish and manage digester resource website, plan state digester conference.	\$ 40,000
The Minnesota Project Clean Energy Program Assistant (.5 FTE) to: support digester Technical Advisory Committee, assist planning of digester planning/feasibility workshops, coordinate digester best practices forums, support planning for state digester conference.	\$ 50,000
<b>Contracts:</b>	\$ -
Digester Technical Advisory Committee: To compile information and conduct research (approximately 60 hours) for digester management guidebook. Committee consisting of an engineer, soil scientist, two existing digester operators, a biologist, electrical engineer, and an economist. 7 members x \$5000 each	\$ 35,000
GIS consultant to develop a GIS study as part of the Minnesota digester feedstock capacity analysis.	\$ 9,000
Research Consultant to conduct quantitative analysis of emissions impact as part of the environmental impact analysis, using data compiled in the capacity analysis.	\$ 7,000
Additional research by economist on Technical Advisory Committee to compile data to be used in developing a study on Minnesota digester economic impact/opportunities outlining total potential economic impacts of widespread digester implementation	\$ 7,000
Communication and Outreach: Consultant to develop a digester products and services directory website. Updating of Minnesota Project website to include guidebook, results of studies, and digester information. Printing and distribution of Digester Management Guidebook.	\$ 34,000
<b>Equipment/Tools/Supplies: None</b>	\$ -
<b>Acquisition (Fee Title or Permanent Easements): None</b>	\$ -
<b>Travel:</b> Mileage and hotel for staff and technical committee for travel for Technical Advisory Committee Meetings, Public Forums, Feasibility Workshops, and Digester Conference planning.	\$ 6,000
<b>Additional Budget Items</b>	\$ -
Minnesota Anaerobic Digester Conference. Costs incurred to plan and coordinate a conference for 200+ participants.	\$ 20,000
<b>TOTAL PROJECT BUDGET REQUEST TO LCCMR</b>	<b>\$ 292,000</b>

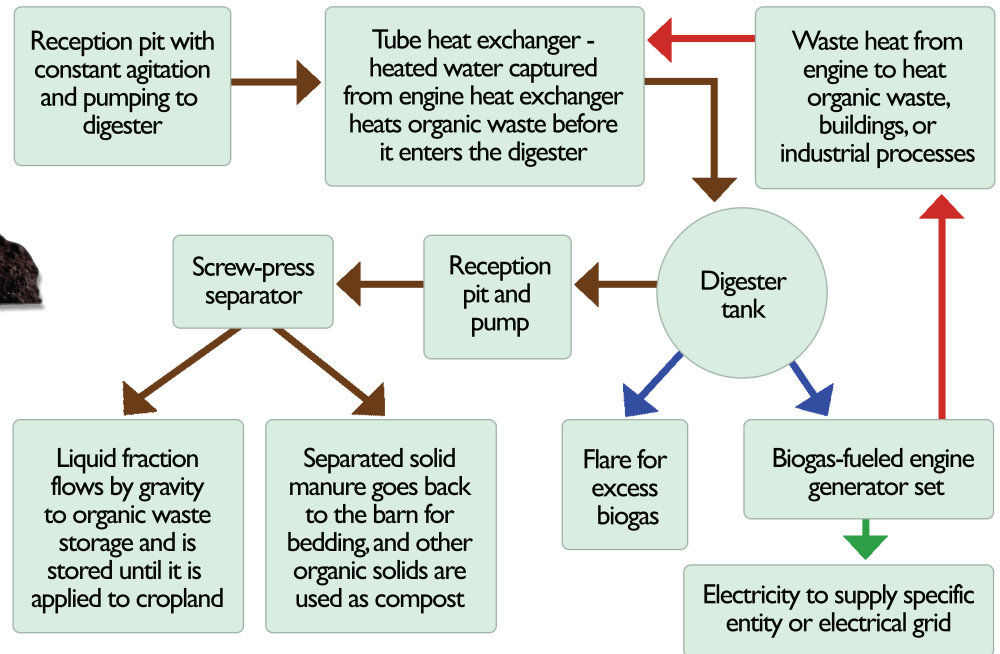
### V. OTHER FUNDS

<b>SOURCE OF FUNDS</b>	<b>AMOUNT</b>	<b>Status</b>
<b>Other Non-State \$:</b> Energy Foundation grant. The Energy Foundation funds non-profits working on energy issues.	\$ 56,000	<i>Pending</i>
<b>Other Non-State \$:</b> Irwin Andrew Porter Foundation grant proposal.	\$ 50,000	<i>Pending</i>
<b>In Kind: AURI:</b> Provide a digester feasibility handbook/analysis template and staff support for panel and research.	\$ 17,000	
<b>In Kind: Clean Energy Resource Teams:</b> Outreach and education support through CERTs Web site, Monthly Updates, Conference, and other communications work.	\$ 5,000	
<b>Remaining \$ from Current Trust Fund Appropriation (if applicable):</b> None		
<b>Funding History:</b>	\$ -	

# Waste Digestion for Clean Energy, Air & Water



## How Anaerobic Digesters Work: A Simple Schematic



## Project Proposal Overview

### Benefits & Beneficiaries

#### PRIMARY

- Waste and nutrient management
- Gas & electric production
- Bedding & compost production

*Beneficiaries include livestock farmers, cities & counties, and food & waste processors*

#### SECONDARY

- Reduced water, air & soil pollution
- Local electricity production

*Beneficiaries include communities near facilities and all Minnesotans*

### Resources & Outcomes

- Digester best practices
- Six outreach meetings & five planning workshops
- Feedstock feasibility study
- Environmental & economic impact studies
- Digester conference
- Online digester company database
- Web-based digester resources & phone hotline

### Our Vision

*Waste Digestion for Clean Energy, Air & Water will lay the foundation for a Minnesota where:*

- Organic waste streams provide 10% of our energy needs by 2030
- Methane gas emissions are cut 10% by 2030 to curb global warming
- Nitrate concentrations in our lakes, rivers & streams are reduced 10% by 2030

# *The* MINNESOTA PROJECT

working for strong local economies, vibrant communities, and a healthy environment

## **Project Manager Qualifications:**

Ryan Stockwell is the Clean Energy Program Manager of The Minnesota Project where he leads all energy-related work including policy development, project management and oversight, education and outreach. Ryan holds a Ph.D. from the University of Missouri in agricultural history and has a background in legislative affairs, working as a policy analyst and legislative assistant in the Missouri House of Representatives where he developed legislation on energy, environmental, and agricultural issues.

## **Organization Description:**

The Minnesota Project is a 501c3 nonprofit organization that connects people with policy to nurture collaborations that build strong local economies, vibrant communities, and a healthy environment. Our programs focus on agricultural practices and policy that promote profitable farms that protect the environment; the efficient use of energy and development of renewable sources; and the production and consumption of local and sustainably-produced foods. The Minnesota Project works in ways that emphasize collaboration, community building, and capacity building. For thirty years we have fostered local empowerment, bridged diverse interests, encouraged shared values, and initiated working dialogues that create positive action and policy.

## **Programs:**

**Clean Energy-** We work to greatly expand development of Minnesota's renewable energy resources — wind, biomass, and solar. We also promote policy and practices that result in efficient use of energy. We bring together rural development, local communities, agricultural and environmental interests to advance the knowledge, capacity and policies needed for a thriving clean energy industry in the Midwest.

**Agriculture & Water -** The Minnesota Project works to ensure that fair farm systems reward family farmers for growing diverse crops while protecting soil and water resources. We do this by bringing together agricultural and environmental interests to create policies that benefit family farms and rural communities.

**Local Food -** The Minnesota Project has convened a broad dialogue process to unite efforts to increase the availability of sustainably produced local foods, called The Heartland Food Network. The Minnesota Project has also developed urban agriculture programs to increase the availability of healthy foods in urban areas.

## **Environmental Issues Addressed**

The Minnesota Project works on policy as well as on-the-ground implementation of:

- Soil and water health
- Environmentally sound agricultural conservation practices
- Healthy, local foods produced in a sustainable manner
- Clean, renewable energy
- Efficient use of energy

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