

**Environment and Natural Resources Trust Fund  
2011-2012 Request for Proposals (RFP)**

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**LCCMR ID: 169-F3+4**

**Project Title:** Winona County Land Rehabilitation through Recovered Landfill Energy

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**Category:** F3, F4. Renewable Energy

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**Total Project Budget:** \$ \$310,500

**Proposed Project Time Period for the Funding Requested:** 1.5 yrs, July 2011 - Dec 2012

**Other Non-State Funds:** \$ 10,000

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**Summary:**

Use methane gas from a closed landfill that is currently being flared/wasted, as supplemental heat for locally grown, sustainable food production, and replicable greenhouse production from renewable energy sources.

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**Sponsoring Organization:** Winona County

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**Location**

**Region:** SE

**Ecological Section:** Paleozoic Plateau (222L)

**County Name:** Winona

**City / Township:** Wilson Township

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_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ Employment	_____ TOTAL _____%

## Winona County Land Rehabilitation through Recovered Landfill Energy

### I. Project Statement

The project will use a lined, capped landfill's methane gas emissions, currently being wasted, to heat and sustain community greenhouses in order to prolong the growing season of locally grown food in the Winona County region. An EPA study of the landfill identifies methane gas availability at adequate levels for 20-25 years with amounts of gas collected diminishing each year.

The project will use methane gas collected from a closed landfill to be used as a supplementary heat source for a Greenhouse Project. This is one phase of healing a 400+ acre site which has been severely impacted by the former landfill. Winona County owns the property surrounding the closed landfill which is collecting and flaring methane gas. The re-directed gas will be used as a heat source for food production rather than being wasted through flaring. Greenhouses will be used to extend the growing season of local food crops including demonstration greenhouses with year-round production using minimal or no non-renewable energy. Project outcomes include small business development and expansion, locally sustainable food production for institutions and the region, business training and development opportunities for immigrant and the general population, and curriculum development for local school districts and higher education institutions. The curriculum experience will support the development of skills directly relating to future environmental employment opportunities, both locally and regionally.

Another significant outcome of this project is to demonstrate the ability to expand the growing season in the upper Midwest through the use of properly designed, installed, and operated greenhouses using limited or only non-renewable energy sources. The Winona County project will develop a sustainable food production system that can be replicated throughout the upper Midwest with a variety of renewable energy sources. The project is capital intensive since future operating costs will be minimal. Water use will be limited through re-circulating aquaponics. Proper greenhouse design will maximize the use of solar power, and the only cost for the methane collection is the piping and heaters.

Winona County, the Winona County EDA, or a member-owned non-profit entity will own the well and gas collection and distribution systems, and will provide oversight of the project and operate the demonstration greenhouses. The less permanent greenhouses will be available on a first come-first serve basis for area citizens, with some greenhouses being specifically reserved for underserved populations and for curriculum development. A nominal fee may be charged for purchase of the gas, water, and or lease of the land to pay the minimal costs expected for non-renewable energy use and property upkeep. Winona County currently owns and maintains the property and future costs will be minimal and will be borne by the Winona County, its EDA, or an established non-profit entity.

### II. Description of Project Activities

#### Activity #1: Infrastructure Development

Budget: \$275,000

This activity includes the completion of well installation and water distribution along with the routing of the landfill methane gas to the proper locations. This activity also includes the construction of two replicable, demonstration greenhouses.

**Outcomes****Completion Date**

1. One High School and two higher education institutions involved in the planning and design of the water and gas collection and distribution system. August, 2011
2. Ten students involved in the design and construction of the two (2), 2,500 sq/ft demonstration greenhouses, one with an aquaponic system. Annual production of 18,000 pounds of food and 7,000 pounds of fish for regional consumption. December, 2011

**Activity #2: Additional Greenhouse Construction**

Budget: \$35,500

Construction of extended and expanded season greenhouses. Commence community garden/new farmer access site. Food production in demonstration greenhouses.

**Outcomes****Completion Date**

1. Construction of three (3), 2,200 sq/ft greenhouses with water and heat access capable of producing 37,500 pounds of produce annually for regional consumption. Construction of ten (10) 2,200 sq/ft greenhouses with water access capable of producing 125,000 pounds of food annually for regional consumption. April, 2012
2. Annual direct and avoided equivalent emission reductions: Greenhouse gas emissions equal to 1,990 passenger cars, carbon sequestered annually by 2,220 acres of pine or fir forest, CO2 emissions from 24,220 barrels of oil consumed, and offsetting the use of 50 railroad cars of coal. December 2012

**III. Project Team/Partners**

**Winona County** – Project planning and development, fiscal agent, monetary contribution, use of land, staff in-kind donation. Winona County will be the only grant recipient. All project partners will assist in maximizing the use of funds and resources for the greatest community benefit. Includes County Board of Commissioners, Duane Hebert, Project Manager, Jill Johnson, Environmental Services Director, Anne Morse, Sustainability Coordinator, Pat Bailey, Water Planner, Pat Moga, Finance Director.

**Winona State University** – Project planning, engineering and development. Includes Science Professors Bruno Borsari, Erin Peters, Mark Engen, Harold Ornes, and students.

**Winona County Economic Development Authority**-Project planning, business development, grants, and loans to project participants. Includes EDA Board of Directors, EDA Energy and Local Foods Sub-Committees, and EDA Executive Director Linda Grover.

**Minnesota Pollution Control Agency**-Technical advice – Don Abrams.

**U.S. EPA**-Technical advice and feasibility – Landfill Methane Outreach Program.

**Project FINE (Immigrant Support Project)**-Board of Directors member Chong ser Vang and Executive Director Fatima Said.

**University of Minnesota Extension**-Tom van der Linden, Extension Educator.

**Community Members**-Several interested citizens involved in project planning.

**IV. Timeline Requirements**

County Board authorization – July, 2011; Infrastructure installation (well, gas system, utilities) and 2 demonstration greenhouses – December, 2011; Completed project – April, 2012.

**V. Long-Term Strategy and Future Funding Needs**

The project will be self-sustaining once the initial infrastructure is in place since the renewable energy sources being used are free. The ability to replicate this project is based on the fact that minimal long-term costs are incurred. Winona County already maintains the property and will absorb the minor costs associated with continued operations, maintenance, and upkeep.

## 2011-2012 Detailed Project Budget

Winona County Land Rehabilitation Through Recovered Landfill Energy Project

### IV. TOTAL TRUST FUND REQUEST BUDGET 2011-2012

<b>BUDGET ITEM</b> <i>(See list of Eligible &amp; Non-Eligible Costs, p. 30)</i>	<b>AMOUNT</b>
<b>Personnel:</b> All in-kind	In kind
<b>Contracts:</b> Contractor to be determined will provide professional services for identifying appropriate equipment for using methane gas as a heat source	\$ 7,500
<b>Equipment/Tools/Supplies:</b> Methane collection and distribution (per EPA and professional estimates).	\$ 50,000
<b>Equipment/Tools/Supplies:</b> Well based on depth of wells in the same general area.	\$ 35,000
<b>Equipment/Tools/Supplies:</b> Water distribution to community gardens and new farmer land access locations.	\$ 2,500
<b>Equipment/Tools/Supplies:</b> Water distribution to greenhouse locations.	\$ 2,500
<b>Equipment/Tools/Supplies:</b> Materials for expanded season greenhouses (10 greenhouses with water access).	\$ 10,000
<b>Equipment/Tools/Supplies:</b> Materials for extended season greenhouses (3 greenhouses with water and supplemental heat . Includes cost of heater, controls and piping).	\$ 15,000
<b>Equipment/Tools/Supplies:</b> Materials for demonstration greenhouses (2 greenhouses of more structurally sound construction and materials including partially built in-ground, rock base and additional piping for enhanced passive heating and improved insulation).	\$ 130,000
<b>Equipment/Tools/Supplies:</b> Shelving, controls and heat absorbing materials for demonstration greenhouses.	\$ 40,000
<b>Equipment/Tools/Supplies:</b> Aquaculture, hydronic tanks and plumbing (2-6,000 gallon tanks).	\$ 15,000
<b>Equipment/Tools/Supplies:</b> Total equipment \$300,000.	
<b>Acquisition:</b> Winona County owned property being utilized.	\$ -
<b>Travel:</b> Minimal travel expected for meeting and site visits.	\$ 500
<b>Additional Budget Items:</b> Electric utility access.	\$ 2,500
<b>TOTAL ENVIRONMENT &amp; NATURAL RESOURCES TRUST FUND \$ REQUEST</b>	<b>\$ 310,500</b>

### V. OTHER FUNDS

<b>SOURCE OF FUNDS</b>	<b>AMOUNT</b>	<b>Status</b>
<b>Other Non-State \$ Being Applied to Project During Project Period:</b> CERTs Grant \$5,000 (secured). Southern Minnesota Initiative Foundation \$20,000 (pending). Winona County \$10,000 cash plus land use and extensive in-kind involvement (secured). Winona County EDA-amount to be determined. Grants and/or loans to individuals/organizations for small business development as part of the project (pending). Project Fine-amount to be determined. Grants and/or loans to immigrant community members served by Project Fine (pending).	\$ 35,000	Secured- \$15,000 Pending \$20,000
<b>Other State \$ Being Applied to Project During Project Period:</b> under review.	\$ -	
<b>In-kind Services During Project Period:</b> Winona County Administration-\$10,000, Winona County Environmental Services \$7,500, Winona County EDA \$5,000, Winona State University \$20,000, MPCA \$5,000, United States EPA \$5,000, U of M Extension \$1,500, Project Fine \$5,000 and Southeast Minnesota Technical 5,000.	\$ 64,000	
<b>Remaining \$ from Current ENRTF Appropriation (if applicable):</b> NA	\$ -	
<b>Funding History:</b> Expenditures- in-kind at this time. Revenues CERTs Grant (\$5,000) Winona County (\$10,000).	\$ 15,000	

## **PROJECT MANAGER QAULIFICATIONS and ORGANIZATION DESCRIPTION**

### **Project Manager**

Duane Hebert, Winona County Administrator 177 Main Street, Winona, MN 55987  
(507)457-6355 or cell (507)429-4025

- Local Government Manager for 18 years in Minnesota and Wisconsin.
- Project Manager for numerous local government projects including:
  - Water/wastewater facilities (Kenyon and Renville, MN)
  - Industrial park development (Renville, MN)
  - Heat recovery, hot water heat exchange project (City of Renville, MN)
  - Building acquisition and remodel (Stevens County and Winona County, MN, and Barron County, WI)
  - New construction (Winona County, MN and Barron County, WI)
  - Housing development (Kenyon and Renville, MN)
- Private sector management for 10 years.
- Barron County Habitat for Humanity Board of Directors.
- Membership in local Lions and Kiwanis service organizations.
- Eleven years as volunteer EMT at the Basic, Intermediate and Paramedic levels.

The responsibilities for the Project Manager are to ensure proper representation of the various community organizations and individuals potentially impacted by this project. Community resources and expertise have been identified and have participated in establishing the scope of the project and for project development. The Project Manager will be responsible for coordinating the project through the various approvals and project development utilizing community resources when available, and resources outside the community when necessary.

### **Organization Description**

The lead agency in this project is the Winona County Board of Commissioners. Since the project is planned on property owned by Winona County, the closed landfill is managed in partnership with the Minnesota Pollution Control Agency (MPCA), and the project fits in with economic development and sustainability projects supported by the Winona County Board, it was prudent for Winona County to serve as the lead agency. Members of the Winona County Board have participated in meetings of a community group which have helped define the project. This group also includes environmental professionals including water planning, land stewardship, fisheries, and landfill/recycling, economic development professionals, several Professors of Science from Winona State University, sustainability coordinators, Board members of the area immigrant support program, University of Minnesota Extension Educator, the Chair of the Winona County Solid Waste Advisory Committee, and several citizens interested in environmental stewardship.

The mission of organization is to rehabilitate over four-hundred acres of land that had been impacted in various ways by a landfill. The capturing of methane gas for community benefits is the first stage in broader mission of greater community benefit from, what will be a community asset.

