

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

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**LCCMR ID: 045-B1**

**Project Title:**

Renewable Energy Assessment/Implementation at Closed Landfill Sites

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**LCCMR 2010 Funding Priority:**

B. Renewable Energy Related to Climate Change

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**Total Project Budget: \$** \$494,000

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

**Other Non-State Funds: \$** \$0

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**Summary:**

Closed landfills become state assets by reducing greenhouse gas emissions directly or through solar, wind or biomass/biogas production. Results include lower site operating costs, local "green" jobs and distributed power.

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**Sponsoring Organization:** MPCA

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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

### PROJECT TITLE: Renewable Energy Assessment/Implementation at Closed Landfill Sites

#### I. PROJECT STATEMENT

Landfill sites contribute 3% of Minnesota's total greenhouse gas emissions. Capturing methane gas emissions from closed landfill program sites will directly reduce greenhouse gas emissions or sites can offset the carbon footprint of Minnesota's state government system through solar, wind energy or biomass/biogas production. The state owns or has control over land suitable for renewable energy production and has performed preliminary scoping/planning for wind and landfill gas-to-energy. This proposal offers the potential to reduce state operating costs for closed landfill sites, create local "green" jobs, and increase production of renewable energy to meet the NextGen goals and potentially serve as a distributed source of energy for local communities, businesses or industry.

Closed landfills could become an asset to the state. Further, the analysis can be directly applied to the 21 MSW landfills that are currently open and operating, and give their public and private owners perspective on their opportunities.

#### II. DESCRIPTION OF PROJECT RESULTS

##### Result 1: Solar Assessment

**Budget: \$56,000**

Analyze and assess production potential, business case scenarios and priority for solar project installation at 112 closed landfill sites.

##### Deliverables:

##### Completion Date:

1. Solar production estimated and sites ranked according to production potential  
September 30, 2011
2. Cost and renewable energy production ownership scenarios for best return to the state  
September 30, 2011
3. Local utility interest/willingness to purchase power production and issues related to transmission capacity  
September 30, 2011
4. Impact assessment on closed landfill remediation and maintenance operations  
June 29, 2012
5. Public meetings for selected closed landfill site to raise awareness of renewable energy potential and gain public input on community needs and desires  
June 29, 2012

##### Result 2: Wind Assessment

**Budget: \$200,000**

Assess site-specific wind production and business case scenarios at MPCA-identified high wind potential closed landfill sites (5-10 sites) and assess natural resource impacts for another 10 priority sites.

##### Deliverables

##### Completion Date:

1. MET tower tests to quantify site-specific wind production  
September 30, 2011
2. Evaluation of numbers/types of turbines based on size of buffer areas and willingness of local utility to purchase power production  
June 29, 2012
3. Cost and renewable energy production ownership scenarios for best return to the state  
June 29, 2012
4. Develop natural resource assessment reports for 10 priority sites/briefs for 10 additional sites  
June 29, 2012
5. Hold public meetings for selected closed landfill sites to raise awareness of renewable energy potential and gain public input on community needs and desires  
June 29, 2012

**Result 3: Landfill (Methane) Gas to Energy Assessment**

**Budget \$78,000**

Using previously developed LandGem data, determine the priority and business case scenarios for landfill gas to energy at MPCA-selected closed landfill sites (between 20-25 sites)

**Deliverables:**

**Completion Date:**

- |  |                   |
|--|-------------------|
| 1. Determine feasibility of implementing landfill gas-to-energy at selected sites and prioritize based on capacity, economic return and environmental benefits   | December 30, 2010 |
| 2. Determine most appropriate technology to use in converting gas to energy (direct use or combustor engines) at sites identified above                          | July 11, 2011     |
| 3. Cost and renewable energy production ownership scenarios for best return to the state   |                   |
| 4. Evaluation of local utility interest/willingness to purchase power production, including issues related to transmission capacity                              | January 30, 2012  |
| 5. Impact assessment on site remediation and maintenance operations  | June 29, 2012     |
| 6. Hold public meetings for selected closed landfill sites to raise awareness of renewable energy potential and gain public input on community needs and desires | June 29, 2012     |

**Result 4: Biomass Generation**

**Budget: \$29,000**

Based on previously published wood fiber availability research, prioritize and develop business case scenarios for growth of biomass for energy production (17 closed landfill sites)

**Deliverables:**

**Completion Date:**

- |  |                  |
|--|------------------|
| 1. Based on previously published wood fiber availability studies and current land use, identify candidate sites for wood fuel production in buffer areas       | August 2, 2010   |
| 2. Evaluate potential markets for harvesting wood fiber for biomass and willingness to purchase and transport wood fiber for use                               | June 29, 2011    |
| 3. Develop cost and wood fuel production ownership scenarios   | March 31, 2011   |
| 4. Hold public meetings for top 10 closed landfill sites to raise awareness of renewable energy potential and gain public input on community needs and desires | October 31, 2011 |

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

The project team is the University of Minnesota Initiative for Renewable Energy and the Environment which will complete assessments for landfill gas to energy, biomass generation and natural resource impact assessments; along with private contractors for the solar and wind assessments. Each group will participate in community meetings related to their assessment. MPCA will provide site-specific data, will coordinate public meetings and manage the project, including development of the final report.

**B. Timeline Requirements**

The assessments will primarily occur in the first year of the project, with community awareness discussions occurring early in the second year of the project. The wind assessment will lag slightly, due to a year-long site-specific wind assessment. All projects will be completed within 2 years.

**C. Long-Term Strategy**

Use of Remediation funds is restricted to cleanup and operational maintenance of closed landfill sites. The state of Minnesota has invested \$150 million into remediation and control of these sites. This proposal could result in income for the Remediation Fund, a direct return on taxpayer investment. The business case scenarios will identify the best return on investment, which may be either a need for additional state investment through bonding and state management of equipment and negotiated energy agreements to return all income to the state; or user agreements with private industry which return less income to the state, but where state funds are not invested to own or operate equipment.

## Project Budget

### IV. TOTAL PROJECT REQUEST BUDGET (Amount is for 24 month project)

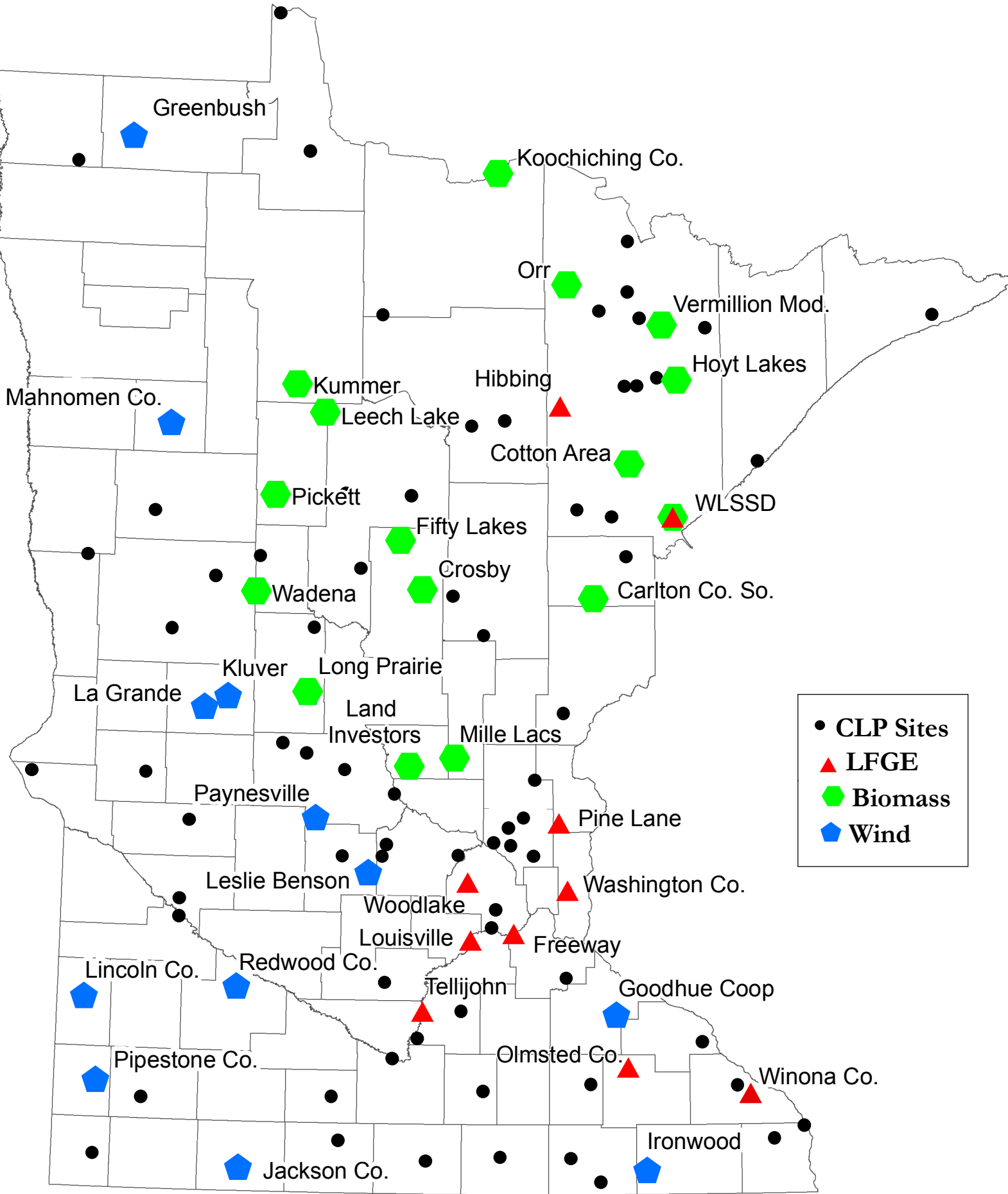
BUDGET ITEM	AMOUNT
<b>Personnel:</b>	\$ 131,000
Project Coordinator MPCA (.45 FTE), 28% fringe: \$81,000	
Administrative support MPCA (.25 FTE) including contracts and fiscal management, 28% fringe: \$50,000	
<b>Contracts:</b>	\$ 213,000
1-2 contracts for solar (\$56,000) and one contract for wind assessment (\$5000-- does not include MET towers listed in equipment) with private companies	
1 contract with UMD-NRRI for biomass (\$29,000) and natural resource assessment-wind sites (\$45,000),	
1 contract with UM-Bioproducs and Biosystems Engineering for landfill gas to energy assessment (\$78,000)	
<b>Equipment/Tools/Supplies:</b>	\$ 150,000
MET tower purchase for 1-year site specific wind assessment \$30,000/tower for 5 towers	
<b>Acquisition (Fee Title or Permanent Easements):</b>	NA
<b>Travel:</b>	NA
<b>Additional Budget Items:</b>	NA
<b>TOTAL PROJECT BUDGET REQUEST TO LCCMR</b>	<b>\$ 494,000</b>

### V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
<b>Other Non-State \$ Being Applied to Project During Project Period:</b>	\$ -	
<b>Other State \$ Being Applied to Project During Project Period:</b>		
<b>In-kind Services During Project Period:</b>	\$ 12,800	
MPCA Renewable energy/sustainable communities staff (0.05 FTE)		
MPCA CLP project managers: site specific data, coordination of public meetings and associated in-state travel (.03 FTE)		
<b>Remaining \$ from Current Trust Fund Appropriation (if applicable):</b>	NA	
<b>Funding History:</b>	\$1,305,000	Rem and Env Funds

MPCA- funded wind assessment ranking for 10 closed landfill sites and gas to energy installation at one facility

# CLP Sites with Renewable Energy Potential



- CLP Sites
- ▲ LFGE
- ◆ Biomass
- ◆ Wind

All 112 CLP landfills will be assessed for Solar power suitability.

Selected landfills will also be evaluated for biomass, landfill gas-to-energy (LFGE), and wind energy

**Project Manager:**  
**Cathy Berg Moeger, Sustainability Manager**  
**Minnesota Pollution Control Agency**

Sustainability Manager will provide project management for this proposal. The Sustainability Manager is currently responsible for reducing MPCA operations' contribution to greenhouse gas emissions, reporting progress to The Climate Registry and "leading the way" with other state agencies. Current sustainability focus areas include source reduction, reduction in vehicle miles traveled (commuter and work fleet), energy efficiency of building operations, and renewable energy production and diesel emission reduction at closed landfills and other remediation sites.

Past experience includes 8 years as Prevention and Assistance Division Director/Chief Financial Officer of the Pollution Control Agency directing technology and human resources infrastructure/ support and \$238 million annual spending plan; and education and financial assistance related to pollution prevention, source reduction and recycling, environmental education, and facility operator training and certification. Nearly 20 years of prior solid waste management program development experience.

**Organizational Description:**

The mission of the Minnesota Pollution Control Agency (MPCA) is to work with Minnesotans to protect, conserve, and improve our environment and enhance our quality of life. The vision for the MPCA is that Minnesotans take responsibility to protect our environment, the air is clean and clear, the land supports healthy ecosystems and sustainable land uses, surface and ground water is clean and sustainable, and the MPCA is an excellent operation.

To fulfill the mission the MPCA has adopted these principles:

- Focus on priorities and manage for environmental results;
- Actively partner to leverage knowledge, ideas and resources;
- Rely on data for decision-making;
- Integrate environmental, economic and social sciences when developing environmental policy; and,
- Strive for excellence and innovation in service delivery.

The MPCA has approximately 960 employees and a biennial budget of \$355.4 million. Programs and services are managed and delivered through MPCA's central office in St. Paul, which has approximately 720 staff, and seven regional offices. The regional offices and their approximate number of employees are as follows: Duluth (58), Brainerd (49), Rochester (48), Mankato (15), Detroit Lakes (36), Willmar (9), and Marshall (25). The MPCA includes a 9-Member Citizens' Board that acts on significant and controversial environmental issues.

Please visit [www.pca.state.mn.us](http://www.pca.state.mn.us) for more detail.