

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

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**LCCMR ID: 172-F3+4**

**Project Title:** Research and Pilot Innovative Renewable Energy Installations

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**Category:** F3+4. Renewable Energy

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**Total Project Budget: \$** \$1,350,000

**Proposed Project Time Period for the Funding Requested:** 3 yrs, July 2011 - June 2014

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

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**Summary:**

Our goal is to reduce the overall energy usage from non-renewable energy sources. This project will develop Minnesota's renewable energy resources and will engage and inform the public.

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**Name:** Kath Ouska

**Sponsoring Organization:** DNR

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**Location**

**Region:** Statewide

**Ecological Section:** Statewide

**County Name:** Statewide

**City / Township:**

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|---|--|--|---|
| <input type="checkbox"/> Funding Priorities | <input type="checkbox"/> Multiple Benefits | <input type="checkbox"/> Outcomes              | <input type="checkbox"/> Knowledge Base                   |
| <input type="checkbox"/> Extent of Impact   | <input type="checkbox"/> Innovation        | <input type="checkbox"/> Scientific/Tech Basis | <input type="checkbox"/> Urgency                          |
| <input type="checkbox"/> Capacity Readiness | <input type="checkbox"/> Leverage          | <input type="checkbox"/> Employment            | <input type="checkbox"/> TOTAL <input type="checkbox"/> % |

# 2011-2012 MAIN PROPOSAL

**PROJECT TITLE:** Research and Pilot Innovative Renewable Energy Installations at DNR Facilities

## I. PROJECT STATEMENT

DNR is committed to expanding its use of renewable energy, and is seeking innovative opportunities to expand on the more traditional wind and PV systems. DNR believes there are untapped opportunities to harness renewable energy from Minnesota's unique and varied natural resources, and wants to research what systems might hold promise at various DNR locations, and then pilot the installation of such systems.

Specific areas of exploration include:

- **Small Hydro Power** –The DNR will showcase a design that can produce energy, provide economic benefits, and be safely integrated into the environment. Several types of equipment have been developed to capture water flow in streams to generate electricity. The DNR will research the different types of equipment, assess their ability to produce energy, determine the economic benefit, and identify environmental concerns. Focus DNR sites for the pilot would be remote locations adjacent to streams and rivers such as Lake Bronson State Park, Hayes Lake State Park, Bear Head Lake State Park, and Buffalo River State Park.
- **Lake Superior Waves** – This project would be the first fresh water wave energy converter (WEC) deployed in the world. Some companies have considered installing an energy converter on Lake Superior with the intent of selling electricity to Minnesota Power. However, they have not been pursued because of the risks involved with permitting, environmental regulations, and capital costs to hook up into the grid. The DNR will research and assess these risks. Then, a test facility will be installed to study the environmental affects and provide data for future installations. Potential State Park locations include Gooseberry Falls, Split Rock, Tettegouche, Cascade River, and Grand Portage.
- **Biomass Pellets** – The DNR has a cooperative farming agreement with an agricultural pelleting company near Willmar that cannot find a market for grass pellets. This proposal will determine how many grass pellets can be mixed in with wood pellets with its pellet burners. The DNR has three burners that use wood pellets that are located in Duluth, Brainerd, and Grand Rapids. The burners' specifications and operational procedures would be assessed to determine if the potential is available at each furnace to supplement wood pellets with grass pellets. Then, the DNR would determine the proportions of grass and wood pellets so that energy output and operational costs are not adversely affected.

## II. DESCRIPTION OF PROJECT ACTIVITIES

**Activity 1:** Assessment and Research

**Budget:** \$250,000

- **Small Hydro Power** – Publish Request for Proposal (RFP) for assessment of what types of systems would be applicable to stream locations and identify potential stream locations based on approximate water resource availability, head availability, and expected energy production.
- **Lake Superior Waves** – Publish Request for Proposal (RFP) for assessment of what types of systems would be applicable to each location. Also, identify potential offshore and hookup locations based on approximate wave energy, density, and frequency.
- **Biomass Pellets** – Specifications of the three furnaces will be compiled and the production of heat and required operations for wood pellets will be documented.

| Outcome   | Completion Date |
|---|-----------------|
| 1. <i>Small Hydro Power</i> – Preliminary engineering report that identifies which type of typical system should be designed for each location.         | July 1, 2012    |
| 2. <i>Lake Superior Waves</i> – Preliminary engineering report that shows the preferred location for a test project and identifies permitting concerns. | July 1, 2012    |
| 3. <i>Biomass Pellets</i> – Report that provides benchmark information of wood pellet burner operations as a basis when mixing wood and plant pellets.  | July 1, 2012    |

**Activity 2: Project Sponsors****Budget: \$100,000**

- Small Hydro Power – Identify project sponsors and publish RFP for design consultant.
- Lake Superior Waves – Apply for any necessary permits concerns, search for potential partners, and publish RFP for design consultant.
- Biomass Pellets – Identify project sponsors and publish RFP for design consultant.

| <b>Outcome</b>  | <b>Completion Date</b>   |
|---|--------------------------|
| <i>1. Small Hydro Power – A design plan will be written that identifies locations, sponsors, stakeholders, and design constraints.</i>                  | <i>December 31, 2012</i> |
| <i>2. Lake Superior Waves – A design plan will be written that identifies locations, sponsors, stakeholders, permit issues, and design constraints.</i> | <i>December 31, 2012</i> |
| <i>3. Biomass Pellets – A design plan will be written that identifies locations, sponsors, stakeholders, permit issues, and design constraints.</i>     | <i>December 31, 2012</i> |

**Activity 3: Installation****Budget: \$1,000,000**

- Small Hydro Power – Produce construction documents and install test pilot small hydro power systems at each stream location.
- Lake Superior Waves – Secure permitting, produce construction documents, and install test pilots.
- Biomass Pellets – Different proportions will be field tested and the difference in maintenance procedures will be identified.

| <b>Outcome</b>   | <b>Completion Date</b> |
|--|------------------------|
| <i>1. Small Hydro Power – Report of test pilot that includes information on water conveyance, turbine location, and electrical output location.</i>                        | <i>June 30, 2014</i>   |
| <i>2. Lake Superior Waves – Report of test pilot that includes information on WEC design, mooring, cable, on-shore conditioning equipment, and environmental concerns.</i> | <i>June 30, 2014</i>   |
| <i>3. Biomass Pellets – A design mix and suggested changes in operational procedures specific to each burner to mix plant pellets with wood pellets.</i>                   | <i>June 30, 2014</i>   |

**III. PROJECT STRATEGY****A. Project Team/Partners**

The following individuals will be led by the Project Manager, Kath Ouska, DNR Facility Manager:

- *Rob Bergh* – Mr. Bergh is the Energy Coordinator for DNR, responsible for the design and development of energy efficiency and renewable energy projects. He is certified in photovoltaic systems design and is an electrical engineer with over 30 years of successful project management experience. Rob will assist in the writing of RFP's.
- *Consultants* – RFP's will be issued to provide expertise, design, planning, construction, and testing in small hydro power, harvesting energy from surface waves, and biomass pellets.

**B. Timeline Requirements**

This project would require 36 months to complete. The first twelve months will be assessment and research of renewable energy technologies, the next six months will consist of determining project sponsorship, and the final 18 months will consist of installations.

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

Opportunities to use renewable energy lend itself well to addressing the three trends that the DNR discussed in its 2009-2013 Strategic Conservation Agenda: changes in outdoor recreation participation, changes related to energy and climate, and landscape changes related to growth and development.

It is also an important part of DNR's efforts to comply with the Governor's Next Generation Energy Act which established 15%, 30%, and 80% reduction in greenhouse gas emissions by 2015, 2025, and 2050 respectively.

## 2011-2012 Detailed Project Budget

### IV. TOTAL TRUST FUND REQUEST BUDGET \$1,350,000 for 3 years

| <b>BUDGET ITEM</b> (See list of Eligible & Non-Eligible Costs, p. 13)  | <b>AMOUNT</b>       |
|--|---------------------|
| <b>Personnel:</b> <i>In this column, list who is getting paid to do what and what is the % of full-time employment for each position. List out by position or position type - one row per position/position type. For each, provide details in this column on the inputs: i.e. % dollars toward salary, % dollars toward benefits, time period for position/position type, and number of people in the position/position type.</i> | \$ -                |
| <b>Contracts:</b>  | \$ -                |
| Contract for Assessment and Research - Small Hydro Power   | \$ 95,000           |
| Contract for Assessment and Research - Lake Superior Waves   | \$ 95,000           |
| Contract for Assessment and Research - Biomass Pellets   | \$ 45,000           |
| Contract for Project Sponsors - Small Hydro Power  | \$ 30,000           |
| Contract for Project Sponsors - Lake Superior Waves  | \$ 30,000           |
| Contract for Project Sponsors - Biomass Pellets  | \$ 25,000           |
| Contract for Installation - Small Hydro Power  | \$ 195,000          |
| Contract for Installation - Lake Superior Waves  | \$ 695,000          |
| Contract for Installation - Biomass Pellets  | \$ 95,000           |
| <b>Equipment/Tools/Supplies:</b> <i>In this column, list out general descriptions of item(s) or item type(s) and their purpose - one row per item/item type.</i>   | \$ -                |
| <b>Acquisition (Fee Title or Permanent Easements):</b> <i>In this column, indicate proposed # of acres and name of organization or entity who will hold title.</i>   | \$ -                |
| <b>Travel:</b> <i>In-state travel to the NE and NW parts of MN for visits to the 9 sites selected for implementation of this request.</i>  | \$ 45,000           |
| <b>Additional Budget Items:</b> <i>In this column, list any additional budget items that do not fit above categories. List by item(s) or item type(s) and explain how number was reached. One row per type/category.</i>   | \$ -                |
| <b>TOTAL ENVIRONMENT &amp; NATURAL RESOURCES TRUST FUND \$ REQUEST</b>   | <b>\$ 1,350,000</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> <i>Indicate any additional non-state cash \$ to be spent on the project during the funding period. For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.</i>  | \$ -          | <i>Indicate:<br/>Secured or<br/>Pending</i>                             |
| <b>Other State \$ Being Applied to Project During Project Period:</b> <i>Indicate any additional state cash \$ (e.g. bonding, other grants) to be spent on the project during the funding period. For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.</i>   | \$ -          | <i>Indicate:<br/>Secured or<br/>Pending</i>                             |
| <b>In-kind Services During Project Period:</b> <i>Indicate any in-kind services to be provided during the funding period. List type of service(s) and estimated value. In-kind services listed must be specific to the project.</i>  | \$ -          |   |
| <b>Remaining \$ from Current ENRTF Appropriation (if applicable):</b> <i>Specify \$ and year of appropriation from any current ENRTF appropriation for any directly related project of the project manager or organization that remains unspent or not yet legally obligated at the time of proposal submission. Be as specific as possible. Describe the status of \$ in the right-most column.</i> | \$ -          | <i>Indicate:<br/>Unspent?<br/>Not Legally<br/>Obligated?<br/>Other?</i> |
| <b>Funding History:</b> <i>Indicate funding secured prior to July 1, 2011 for activities directly relevant to this specific funding request. State specific source(s) of funds.</i>  | \$ -          |   |

**April 2010**

**LCCMR Proposal: Research and Pilot Innovative Renewable Energy Installations**

**Project Manager Qualifications and Organization Description**

**Project Manager Qualifications:**

Kath Ouska will be the Project Manager for this project. Kath is the Facility Manager for DNR, and leads a team of professional designers highly versed in the design and development of energy efficiency and renewable energy projects. She was a leader in the initiation of the B3 and MN Sustainable Building Guidelines, and a registered architect with over 20 years of successful project management experience.

**Organization Description:**

DNR's mission is to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. DNR is committed to conserving natural resource systems - working with citizens and partners to achieve its three-part mission.

