



# Minnesota Department of Natural Resources

500 Lafayette Road  
St. Paul, Minnesota 55155-40\_\_

Project Title: *Development of Renewable Energy Strategies*

Contract Number: EP3-13      Milestone Number: 1      Report Date: 6.12.2009

Principal Engineer: TBD      Contract Contact:  
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Congressional District (RDF Awardee): Fourth

Congressional District (PV Installations): TBD

Project funding provided by customers of Xcel Energy through a grant from the Renewable Development Fund.

## MILESTONE REPORT

**Executive Summary:** The Department of Natural Resources (DNR) is will be installing small-scale solar photovoltaic systems into several of their facilities and develop a renewable energy interpretive program. This is in preparation for large-scale implementation of renewable energy resources into new and existing DNR facilities. DNR is interested in doing renewable energy in a way that is not only in keeping with its mission and the Governor's Executive Order 05-16, but in a way that will inform and encourage other renewable energy applications. Installations included in this Project are rooftop solar photovoltaic systems connected to the grid and freestanding photovoltaic systems at locations where a building is well shaded but open sunlight is close; these systems will be installed at selected area offices, interpretive centers, visitor centers, and hatcheries. The Project will form the framework for establishing renewable energy design and specification standards for future photovoltaic installations at the DNR.

This project will provide DNR with a process and the tools for determining the feasibility of various renewable energy systems, the development of standard designs and specifications for photovoltaic systems, a number of grid-connected and customer-sited installations, a monitoring process, and a renewable energy interpretive program. The DNR has over 2,500 buildings ranging from vault toilets to visitor centers at 182 sites throughout the state. Within these facilities opportunities exist for solar photovoltaic systems. The DNR will use flat plate photovoltaic arrays mounted on sloped roofs at State Park sites, flat plate photovoltaic arrays mounted in series on flat roofs at larger buildings such as Regional offices, and flat plate photovoltaic arrays mounted on the ground at historic sites. All systems are anticipated to be fixed and will be connected to the grid.

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The goals of this project are to develop a series of renewable solar energy strategies, prototypes, and specifications that will become part of all future new and renovated DNR facilities and to install at least 99kW of photovoltaic systems, both grid-connected and customer-sited. Specific objectives include:

- The development of assessment tools for building site selection, both to select sites for this project as well as for use by DNR to assess sites for future renewable energy installations
- Assessment and selection of sites serviced by Xcel electricity for inclusion in this project
- Design, construction documents, and construction administration for a minimum of 99kW of solar array collection systems for electricity generation at approximately 6 DNR state parks, regional and area offices
- The development of an interpretive program about the solar energy installations at the above referenced sites.

Technical Progress: This milestone involved the selection of an energy engineering firm. The selection criteria for the engineer was based on the following criteria:

- A minimum of 20 years experience providing energy engineering in Minnesota
- Experience in photovoltaic systems design
- Experience with buildings the size and scale of DNR buildings
- Experience in life-cycle cost analysis.

The DNR selected LHB Architects and the contract was signed on June 12, 2009. LHB meets all our expectations for a design partner and will bring years of experience and a high level of creativity to our project. LHB will be responsible for:

- Development of the assessment process and tool for the building site selection of photovoltaic installations
- Assessment and selection of specific installation sites for this project
- Design and construction administration of the project photovoltaic installations
- Provide assistance with development of a DNR's renewable energy interpretive program.

Additional Milestones: None.

Project Status: The project is on schedule and within budget.

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