INFORMATION SHEET
RENEWABLE DEVELOPMENT FUND

Investing in Renewable Energy

SAINT OLAF COLLEGE WIND SELF-GENERATION

Project Description

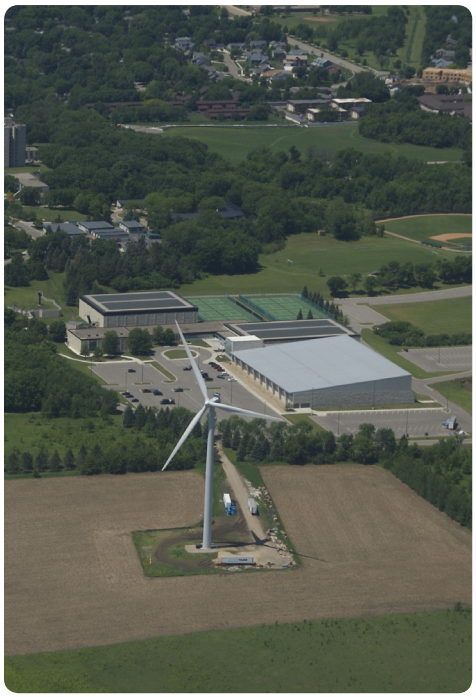
Installed 1.65 megawatts (MW) of wind generation on the Saint Olaf College campus in Northfield, Minnesota. Saint Olaf's goals for the project were to incorporate a portfolio of renewable energy into an institutional setting with the cleanest possible business model, reduce the environmental impact of the college's energy needs, reduce the college's impact on Xcel Energy's generation and transmission facilities while reducing the impact of future loads on the college diesel plant, and the development of a model in which a large institutional utility customer can demonstrate a global approach to resource consumption.

Methodology

- Prepare a wind study to examine the general wind in the area, as well as exact terrain features
- Design the project to feed directly into the campus distribution system
- Identify appropriate turbine models
- Order turbine and prepare site
- Erect wind turbine

Executive summary

Saint Olaf College installed a Vestas NM-82 1.65 MW wind turbine, which was interconnected to the college's 13.8 kV loop around the campus. The turbine was erected on the west side of campus, near the main feeder line in a secure area. Saint Olaf's utility-grade wind turbine provides up to one-third of the college's energy needs. The turbine was completed and commissioned in September 2006. In addition to generating interest from corporate, educational, and government sectors, the project has made a significant impact on reducing the college's carbon footprint. Wind generation will also help to extend the college's existing diesel power plant capacity by providing part of the base load.



Grantee: Saint Olaf College
Project Dates: 10/11/206 – 4/30/2007
RDF Funding Cycle: 2nd
Project Funding: $1,500,000 RDF Grant (Total project cost $2,595,000)
Project ID: EP-39
RDF Mission: To increase renewable energy market penetration, assist renewable energy projects and companies, and support emerging renewable energy technology through research and development.

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Benefits

- Wind energy has become a component of Saint Olaf's comprehensive utility plant; the site had very good wind resources for the area
- Reflects a physical representation of the college's stewardship of natural resources and the possibilities for distributed wind generation
- It has become an important educational tool for Saint Olaf, regional school students, and the Northfield community
- It's a model that can be replicated and adopted by any college or university campus, significant medical complex, veteran's home, municipal/county government complex or small community
- It has reduced the college's carbon footprint, measured as Metric Tonnes of Carbon Dioxide Equivalencies (MTCDE), of heating, lighting, plug load, and cooling the campus by 25 percent (from 9.4 MTCDE per student to 7.05 MTCDE/student)

Lessons learned

- Saint Olaf College discovered that there are significant impediments to small wind generation, even as a self-generator
- Wind generation equipment suppliers may not be eager to work with small installations, therefore limiting turbine availability
- Control strategies for simultaneous operation of the college's backup diesel generation and wind turbine are too complicated and impractical, which requires turbine shut down when the diesel plant is running
- Because of the variable nature of wind, standby charges are incurred to guarantee the stable supply of electricity at all times and must be incorporated into operating costs

Outcomes

- Created a capstone course for students majoring in Ecology and the Environmental Studies
- Was a central component of a nationwide web seminar on turbine implementation that was attended by 41 colleges and universities
- Featured in a presentation on Saint Olaf's comprehensive sustainability efforts at the Association of College Unions International annual meeting in Iowa City, Iowa
- Featured during a National Wildlife Federation web seminar on greenhouse gas emissions and implementation strategies
- Project presented at local school assembly programs and was an independent project for several students at Northfield's charter schools

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