

MSU: Building Montana's Wind Workforce

A Distributed Wind Case Study



The 50 kW Endurance wind turbine supplies electricity to the MSU Great Falls campus.

The Montana State University Great Falls campus demonstrates Montana's commitment to workforce development and sustainable energy for multiple reasons. First, the university offers a two-year Sustainable Energy Technician degree that has produced over 20 graduates, all of whom have been hired by Montana-based wind farms or contractors. Second, the university has installed a 50 kW wind turbine on campus that provides about half of the electricity use of the Skilled Trades Building where the wind energy technicians are trained. The students monitor the wind turbine's performance through a web-based data collection system and use it for hands-on safety training, maintenance inspections, and mechanical and electrical training.

Getting the Right Approvals

In the fall of 2007 the university began exploring the idea of installing a wind turbine on campus by conducting a wind energy feasibility study that indicated that the campus' average wind speed was 12 mph, enough to make a viable project.

After an extensive internal university approval process, the project needed to get approval from the city. In Great Falls, wind turbines must go through a conditional use permit process that includes public hearings. During the hearings, campus neighbors voiced concerns about sound, shadow flicker, and avian mortality. The university was able to address these concerns by providing current research and literature on each topic. In addition, the university established appropriate setbacks from property lines that would ensure compliance with the city's sound ordinance. The conditional use permit process took about one year to complete. Since then, the city of Great Falls has adopted a more streamlined permit application and zoning ordinance that allows small wind turbines to be installed in any zoning district as long as the installation satisfies certain pre-defined criteria.

“Our mission is to provide trained workers for the energy-producing sector of our economy.”

– Mel Lehman, Great Falls College Montana State University

Finding the Right Turbine

When MSU Great Falls initiated their search for a wind turbine, they had to take a number of factors into account. First, they wanted to install a large enough wind turbine to supply a significant amount of electricity to the campus. Second, they wanted a turbine model that accurately represents the type of large-scale technology used in Montana’s wind farms so that students could get relevant experience. Third, they needed to meet Montana’s net metering laws which limit the size of on-site generation to 50 kW. And finally, out of respect for their neighbors and campus community, they wanted a turbine model that produced minimal sound.

The search was led by Mel Lehman, director of the campus’ Wind Montana Project, with guidance from a turbine review committee including faculty and staff. According to Lehman, “The Endurance Wind Power 50 kW was ranked #1 for several reasons, including production potential in our wind regime, history of the technology, the reliability of prototypes in operation, the educational value to the University’s programs, and lower operational acoustic levels.”

A Visible Campus Symbol

The MSU turbine was commissioned in April 2010 and was installed on a 120-foot tall monopole tower. Shortly after commissioning MSU held a public information session for its surrounding community to learn about the turbine. Some of the community members, who were originally concerned about the acoustics, came to express their satisfaction with the turbine as “very quiet.”

The turbine experienced some down time during the initial years of operation due to unexpected component failures; however, most of these repairs were covered by the wind turbine manufacturer’s warranty. The turbine manufacturer, Endurance Wind Power, is based in British Columbia, Canada, but a Great Falls based contractor, Moodie Wind Energy LLC, provides the warranty repair work on behalf of Endurance.

The campus wind turbine has received a lot of community attention and the university often receives requests for tours or information. However, not all of the attention is positive; according to Lehman, “If our turbine is down for any period of time we get calls from the community including County Commissioners and other public officials wanting to know why.”



The MSU Great Falls campus wind turbine provides training opportunities for their successful Sustainable Energy Technician degree program.

Photo source: ThinkOne Energy Services



The 120-foot tall wind turbine is a visible campus symbol in addition to an educational tool.

Photo source: MSU Great Falls

The Northwest Wind Resource & Action Center provides timely, accurate information on wind energy issues in the Pacific Northwest. It is supported in part with funding from the U.S. Department of Energy and managed by Renewable Northwest, Oregon Department of Energy, and Northwest SEED. www.nwwindcenter.org.



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