

UNIVERSITY OF MINNESOTA MORRIS

High energy. Low consumption.

Biomass Leadership

A National Leader in Green Energy

During the summer of 2007, the University of Minnesota, Morris (UMM) will break new “green energy” ground by constructing a biomass gasification reactor and facility on campus. The reactor, located near UMM’s current heating plant, will convert corn stalks and other residual materials into a syngas—similar to natural gas—which can be burned to produce clean energy to generate heat (and cooling in the near future) for the campus. The facility will serve as a platform for UMM’s research partners to identify trade-offs and opportunities surrounding gasifying other agricultural residues.



A Bright Future for the Prairie

The intended impact of the gasifier is to offset more than 80 percent of UMM’s heating and cooling needs currently met by fossil fuels, like natural gas and fuel oil. By replacing a majority of its traditional fuel mix, UMM will lessen its impact on global warming and provide new revenue streams for area agricultural producers. Along with the West Central Research and Outreach Center (WCROC), UMM will investigate answers to tough questions like the pros and cons of producing biomass energy with agricultural residue or dedicated energy crops, like mixed prairie grasses. The biomass facility is an important step toward integrating renewable energy technology into rural settings and understanding what a biomass energy economy will look like in the future. The gasifier is one more step toward UMM’s goal of reaching energy self-sufficiency by 2010.

UMM’s Partners

Over the years, a “research triangle” has developed between UMM, the WCROC, and the United States Department of Agriculture (USDA) Agricultural Research Service—North Central Soil Conservation Research Lab. The WCROC is the site of a 1.65MW wind turbine that supplies energy to UMM. The “soils labs,” as it is commonly known, is researching energy crops for the future. The research triangle partners are working hard to make Morris a destination for the people of the State of Minnesota, our region, and the world who want to learn more about a future that will be less dependent on foreign sources of energy.

Biomass: Facts and Figures

- Biomass gasification converts biomass, which includes many agricultural residues (like corn stover residue remaining after grain harvest, wood waste, wheat straw and soybean residue, and perhaps in the future, mixed prairie grasses including switchgrass), into an energy-rich gas that can be burned like natural gas.
- By heating biomass with very little oxygen, one can convert a solid, like corn stover, into a gas composed of mostly carbon monoxide and hydrogen, this combination when mixed with oxygen burns to yield a lot of energy.
- It is expected that the biomass facility will inject hundreds of thousands of dollars into the local economy.
- The biomass plant in Morris will convert about 9,000 tons of corn stover per year into syngas that UMM will use to offset its current natural gas and fuel oil usage.
- About 80 percent of UMM’s current traditional fossil fuel usage will be offset primarily with corn stover.
- Approximately 677,000 tons of agricultural residue has been identified within about 100 miles of Morris.

Biomass: Facts and Figures (cont'd)

- UMM will collect the biomass from a 20-mile radius around Morris.
- Twenty-five million BTU/hour produces approximately 15,000 lbs/hour of 150 psi steam.
- UMM will work with the West Central Research and Outreach Center and the USDA Agricultural Research Service-North Central Soil Conservation Research Lab, located in Morris, to develop best practices for biomass collection and storage.
- With several partners, UMM performed a test burn of various biomass feedstocks, including corn stover and a corn stover/ethanol mash, with positive results.
- In partnership with the WCROC, UMM will develop a toolbox of information for other institutions or municipalities located near large biomass pools to use to replicate the UMM facility.

The University of Minnesota Renewable Energy Center at Morris is led by the University of Minnesota in partnership with many key stakeholders:

University and Research Organizations

West Central Research and Outreach Center
University of Minnesota, Morris
Initiative for Renewable Energy and the Environment
West Central Regional Sustainable Development Partnerships
Agriculture Utilization Research Institute (AURI)
South Dakota State University
University of North Dakota Energy and Environmental Research Center (EERC)
National Renewable Energy Lab

Non-Government Organizations

Clean Energy Resource Teams (CERTS)
Minnesota Soybean Growers
Minnesota Soybean Research and Promotion Council
Minnesota Corn Growers
Minnesota Corn Research and Promotion Council
Southwest Foundation
Upper Midwest Hydrogen Initiative

Government Agencies and Programs

State and Federal Legislators
City of Morris
Minn. Department of Commerce Energy Office
Legislative Commission on Minnesota Resources
Minn. Office of Environmental Assistance
Stevens County Economic Improvement Commission

Companies

Otter Tail Power Company
Great River Energy
Xcel Energy
Diversified Energy LLC
Chippewa Valley Ethanol Company
Runestone Electric Association
Norsk Hydro

A number of agriculture producers, citizens, and University of Minnesota faculty have also been key partners in the Renewable Energy Research and Demonstration Center at Morris.

To learn more about green energy initiatives at UMM, visit www.morris.umn.edu/greencampus.

West Central Research and Outreach Center
Highway 329
Morris, Minnesota 56267
320-589-1711
wcroc.cfans.umn.edu

Office of University Relations
600 East Fourth Street
Morris, Minnesota 56267
320-589-6050
www.morris.umn.edu

UNIVERSITY OF MINNESOTA

MORRIS

