



Northwest Clean Energy Resource Team *Strategic Energy Plan Summary*

June 2005

BIOMASS
GASIFICATION
AND
GEOTHERMAL
TECHNOLOGIES
ARE MOVING
THE
NORTHWEST
CERT TOWARD A
CLEAN ENERGY
FUTURE

CERTs Partners:

Minnesota Department of Commerce, The Minnesota Project, University of Minnesota Regional Sustainable Development Partnerships, Rural Minnesota Energy Board, Metropolitan Counties Energy Task Force, Resource Conservation and Development Councils

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Much of the economy of Northwestern Minnesota is based on agriculture and forestry. The Northwest Clean Energy Resource Team has therefore prioritized clean energy projects, biomass and bio-gas, that create opportunities from the waste products of these industries while also advancing geothermal projects in the region.

BIOMASS GASIFICATION TECHNOLOGY IS ON THE MOVE

Biomass energy is any energy that is derived from organic matter. This can include the burning of wood for heat, electricity, or cooking, the utilization of methane from agricultural processors and landfills, and use of plant fuel additives such as ethanol or biodiesel — nearly all of which are strong resource fits for the Northwest. After evaluating the local potential for a large biomass energy facility and realizing the tremendous logistical requirements such a facility would entail, the team decided to focus its efforts on opportunities to pilot onsite generation using a mobile biomass gasifier sized for an industrial application. An on-site gasifier allows local businesses with a ready waste stream to turn that waste to energy, but avoids potential transportation and transmission constraints.

CERT members from the University of North Dakota Energy and Environmental Research Center (EERC) have

developed a prototype mobile biomass gasifier — a small powerplant on a flatbed truck. During the summer of 2004, the team sponsored biomass gasifier demonstrations at three county fairs to educate the public about this technology. The Northwest CERT also connected Darren Schmidt from EERC with the Agricultural Utilization Research Institute (AURI) to test fire grass seed cleaning residues in the gasifier. Pembina Trail and Gizzibi Resource Conservation and Development councils (RC&Ds) are assisting the team's efforts to continue gasifier testing by investigating the possibility of test firing local wood waste and wood residues as well.

"Biomass gasification is a process that businesses can use to turn their waste material into something valuable," said John Schmidt of the Pembina RC&D. "It would improve their economics of operation." Biomass gasification will be commercially available in a short period of time, Schmidt said, and CERTs is helping to make the connections that will make it happen.



CERTS ASSESSING BIOGAS OPPORTUNITIES

Biogas digesters essentially collect organic waste and capture the resulting methane gas, which can be used for heat or electricity. There are a variety of bio-gas projects in the region. Minnesota Dehydrated Vegetables in Fosston currently operates a biogas digester. The City of Moorhead uses a digester to treat wastewater and American Crystal Sugar treats wastewater and collects methane to use as heat for pulp drying at its plants. Dozens of agricultural processing plants have been identified by Northwest CERT as likely candidates for additional biogas projects in the region. The team is evaluating the costs and benefits of biogas digesters at each processing facility to learn how such projects can best be accelerated in the region.

CERT IS GEARING UP FOR GEOTHERMAL

Geothermal energy refers to the natural heat from beneath the earth's surface, and while there are no active geysers or volcanoes in northwestern Minnesota, it is possible to use geothermal energy to heat and cool homes and buildings. This technology is a great option in the Northwest, where many homes have electric heat. Geothermal systems are both more efficient than standard electric heaters, gas-fired furnaces, and central air-conditioning and not subject to fluctuating gas

GEOTHERMAL SYSTEMS ARE BOTH MORE EFFICIENT THAN STANDARD ELECTRIC HEATERS, GAS-FIRED FURNACES, AND CENTRAL AIR-CONDITIONING AND NOT SUBJECT TO FLUCTUATING GAS PRICES.

prices. If a geothermal system is included in a home mortgage, perhaps adding an additional \$50 per month, the energy cost savings over a one-year period easily exceed the added yearly mortgage costs. To determine the exact cost savings, the CERT team is funding students from University of Minnesota at Crookston who are constructing a web-based heating fuel comparison calculator.

The team also used funding from the University of Minnesota's Initiative for Renewable Energy and the Environment for an energy efficiency, landscaping and green campus evaluation of the Crookston campus.

The team has identified barriers in education, permitting and funding, and is now engaged in overcoming these challenges and implementing projects. The Northwest's diverse geography and its well-rounded CERT membership make it a clean energy leader in the state of Minnesota.



The East Grand Forks bike path is lit by solar energy.

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Northwest CERT Member Snapshot:

Bemidji State

East Grand Forks
Municipal Utility

Gizibii RC&D

Individuals interested in
energy issues

Northern Municipal
Power Agency

Northwest Minnesota
Foundation

Pembina Trail RC&D

Red Lake DNR

Thief River Falls

University of Minnesota-
Crookston

University of North Dakota
Energy and Environmental
Research Center

White Earth Reservation
Tribal Council