



Menominee Tribal Enterprises Increases Energy Independence and Reduces Carbon Footprint

The Menominee Indian Tribe is aiming for energy independence and a smaller carbon footprint by shifting from fossil fuel-based electricity to generating their own renewable electricity from wood residues, such as wood chips. The project also provides sustainable local jobs, reduces emissions, and improves local air quality.

The project gives Menominee Tribal Enterprises (MTE) a competitive edge by reducing energy costs. Owned and operated by the Menominee Indian Tribe, MTE actively manages over 230,000 acres of forest land on Tribal

lands and operates a sawmill and lumber drying operation in Neopit, WI, about 45 miles north-west of Green Bay.

MTE sustainably harvests more than 15 million board feet of timber per year. The mill alone employs 160 during peak season, and MTE employs about 300 people across its operations

A Long Tradition of Sustainability

Since 1908, MTE has produced and manufactured high-quality sustainable forest products. Using wood residues from the Tribe's sawmill creates a steady fuel stream for the combined heat and power (CHP) district energy plant. This high-efficiency biomass energy system generates roughly 85 billion British thermal units (Btu) of heat and 1 million kilowatthours (kWh) of electricity per year to power the Tribe's sawmill and lumber drying operation.

CHP System Delivers Renewable Energy and Cost Savings

A CHP system provides heat and power onsite in one single, highly efficient process. Wood is fed into the system, where it is converted

to thermal energy and used to generate steam that is distributed to the steam-driven district energy system for eight buildings and wood kilns. By generating heat and power onsite, CHP systems can achieve more than 80 percent efficiency. In comparison, using this energy to generate electricity alone would be only 30 percent efficient.

The MTE district biomass CHP project involved removing an existing oversized and inefficient wood-fired steam boiler and installing a high-pressure CHP system in the existing boiler house. The CHP system includes a wood-fired steam boiler and a backpressure steam turbine generator.

The CHP system came online in April 2016 and has delivered significant efficiency gains. It consumes 8,500 tons of sawmill residues per year, considerably less than the 20,000 tons consumed each year by the previous system. The system saves MTE energy and maintenance costs of around \$500,000 annually. Particulate emissions were reduced by more than 115 tons per year.

Steam is generated at a higher pressure than needed for distribution to the eight buildings at the MTE complex and reduced to distribution pressure through the backpressure steam turbine. One of the existing 800-hp lower-pressure steam boilers was refurbished to provide additional capacity to meet peak demand and serve as a backup for the new boiler.

Partnerships Make This Project Possible

The project cost about \$3.8 million to complete. Project partners provided about \$1.65 million in grants and technical assistance from the U.S. Department of Agriculture (USDA), Forest Service's Wood Energy Technical Assistance Team helped make the project possible. Participating agencies and organizations included the Forest Service, USDA Rural Development, U.S. Department of Energy, U.S. Department of the Interior, Bureau of Indian Affairs, Focus on Energy, U.S. Endowment for Community and Forestry, and the Indian Land Capital Company.

Cover Page Photo: On April 20, 2016, key stakeholders celebrated the Menominee Tribal Enterprises biomass CHP district energy plant's official opening in Wisconsin. Courtesy photo by Menominee Tribal Enterprises.

FAST FACTS

- CHP system generates an estimated 1 million kWh of renewable electricity per year—equivalent to the annual electricity use of 97 homes.
- Saves approximately \$500,000 in annual operating costs.
- Reduces forestry biomass fuel use by over 11,000 tons per year.
- Reduces particulate matter emissions by an estimated 115 tons per year.
- Increases competitiveness by lowering operating costs.
- Created 34 full-time jobs during construction.

More Information

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Office of Indian Energy Director, Chris Deschene, in front of the historic wood energy relic at Menominee Tribal Enterprises' biomass CHP district energy plant in Wisconsin. Courtesy photo by Menominee Tribal Enterprises.