



MENOMINEE TRIBAL ENTERPRISES BIOMASS CHP DISTRICT ENERGY SYSTEM



Menominee Tribal Enterprises (MTE) actively manages over 219,000 acres of forestland located on tribal lands, and operates a sawmill and lumber drying operation located in Neopit, Wisconsin. The sawmill complex, also located on tribal lands, processes timber into marketable forest products. MTE recently completed a Biomass Combined Heat and Power District Energy Project at the sawmill, which provides heat for kilns and ~150,000 ft² of processing and office space. The project was implemented to replace

aging boiler equipment, improve local air quality, reduce operating costs, and increase sales of mill residuals.

The system includes a new advanced biomass combustion unit and steam boiler rated at 8.6 mmBtu/hr, a new combustion control system for an existing 25 mmBtu/hr biomass boiler, a 190 kW back-pressure steam turbine, new steam infrastructure (deaerator, feedwater pumps, controls, steam metering, etc.), new hot water district heating for a new sawmill building, and interconnection to the existing steam district heating system. The project provides an annual savings of over \$500,000 through increased residual sales of >11,000 tons/yr, operating cost savings, and electric generated and used onsite. The system provides approximately 24% (1,000,000 kWh) of the annual electric usage, and reduces PM emissions by over 115 tons annually.

The project had a total cost of ~\$3.8 Million, which included some ancillary facility upgrades. Funding for the system was provided from the following sources and MTE capital.

- US Forest Service Wood Education and Resource Center – Woody Biomass Utilization Technical Assistance Program - ~\$35,000 in technical assistance including feasibility study, cost shared funding of EPA compliance energy assessment, and assistance in developing and submitting deliverables to EPA on existing system – assistance provided in 2012
- US Forest Service – FY 2013 Woody Biomass Utilization - \$250,000 for design of MTE Biomass District Energy CHP project
- USDA Rural Development – FY 2014 REAP Grant - \$250,000 for boiler system energy efficiency improvements as part of MTE Biomass District Energy CHP project
- US Department of Energy – FY 2014 Tribal Energy Grant Program - \$1,036,000 for MTE Biomass District Energy CHP project; in addition this award included use of biomass processing equipment as an eligible third party, that was repurposed from a previous award by DOE to Piney Creek, LP
- Bureau of Indian Affairs – Energy and Mineral Development Program – \$25,000 for integration of the DOE biomass processing equipment that was repurposed from a previous award by DOE to Piney Creek, LP
- Focus on Energy – 2014 Renewable Energy Competitive Incentive Program - \$150,000 grant for CHP component of the project
- US Endowment for Community and Forestry – 5-year loan for \$250,000
- Indian Land Capital Company – 5-year loan for \$1,500,000

PROJECT AT A GLANCE

Project Cost: \$3.8 Million

Grant Dollars:

- 2013 WBUG Grant - \$250,000
- 2014 DOE Grant - \$1,036,000
- 2014 REAP Grant - \$250,000
- 2014 FOE Grant - \$150,000
- 2014 BIA Grant - \$25,000

Project Savings: >\$500,000/yr in energy/O&M costs

Fuel Usage:

- 20,000 ton/yr wood residue before
- 8,500 ton/yr wood residue after

Energy Profile (annual):

- ~85,000 mmBtu heat
- ~1,000,000 kWh electric generation



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