



GUNDERSEN LUTHERAN HOSPITAL BIOMASS CHP DISTRICT ENERGY SYSTEM



The Gundersen Health system had a goal to achieve 100% energy independence by 2013. The thermally-led biomass combined heat and power system installed at the Gundersen Lutheran Hospital in La Crosse, Wisconsin represents 38% of the system's goal. The project replaces over 90% of the annual fossil fuel use for heating at the 1.1 million square foot facility with locally sourced renewable biomass resources, while also providing enough renewable electricity generation onsite to power over 250 homes.

The project consists of a 27 mmBtu/hr advanced biomass gasification/combustion system and steam boiler rated at 450 psig and 350 kWe backpressure steam turbine. This equipment is located in a new central steam plant for the facility that also houses the onsite wood chip storage and automated wood handling equipment. Steam is produced at 400 psig, expanded through the backpressure steam turbine (generating electricity), and distributed at 100 psig to the steam district heating system for the campus.

The project meets local, state, and federal goals for rural economic development and creation of jobs centered on renewable energy. The project keeps over \$600,000 spent on thermal energy annually within the local economy, helping to create jobs within the local forest products industry. The project also helps Gundersen to meet greenhouse gas emission reduction goals by providing a net annual reduction of over 9,500 metric tonnes of carbon dioxide.

The USFS Wood Education and Resource Center provided the feasibility study for the project that identified a viable path forward for the thermally-led combined heat and power system, which allowed the owner to pursue project implementation. AFS Energy Systems, Inc. provided the biomass system, and Elliott Group provided the backpressure steam turbine for the system. The project was awarded \$220,000 by the Wisconsin State Energy Office through the "Linking Fuels Reduction and Wood Energy Program", which is funded by the US Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry Division.

PROJECT AT A GLANCE

Thermally-led CHP System Details:

- 27 mmBtu/hr biomass steam system
- 350 kWe BPS turbine

Project Savings: \$500,000 annual energy savings

Energy Profile (annual):

- 15,000 green tons/yr wood chips
- Replacing 157,000 mmBtu/yr of natural gas (90%)
- 2,200 MWh/year generated
- 9,500 mtCO₂/year net carbon offset



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