



CHILLICOTHE VA MEDICAL CENTER BIOMASS CHP DISTRICT ENERGY PROJECT



The Veterans Administration Hospital of Chillicothe Ohio placed its biomass district energy system into service in May of 2012. The system replaces over 60% of the annual fossil fuel use for thermal energy a facility with locally sourced woody biomass, while generating renewable electricity and offsetting the use of electricity for cooling. The state-of-the-art biomass renewable energy plant generates steam and distributes it to the facility, which includes over 30 buildings and 1 million square feet of conditioned space.

The project consists of a 20 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 includes three 20 mmBtu/hr natural gas steam boilers which provide backup and peaking for the plant. Steam is distributed at 65 psig to the steam district heating system. One of the buildings is cooled from the steam system using a 200-ton absorption chiller.

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 the VA to meet greenhouse gas emission reduction goals by providing a net annual reduction of over 5,200 metric tonnes of carbon dioxide. In recognition of their achievement with the project, the Department of Energy and the Federal Interagency Management Task Force awarded the Chillicothe VA Medical Center with a Federal Energy & Water Management Award in 2013.

The USFS Wood Education and Resource Center provided the initial 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. The project was constructed by Bristol Design Build Services, LLC, and the biomass system was provided by Wellons, FEI.

PROJECT AT A GLANCE

- Thermally-led CHP System Details:**
- 20 mmBtu/hr biomass system
 - 350 kWe BPS turbine
 - 200 ton absorption chiller

- Energy Profile:**
- 10,000 green tons/yr wood chips
 - Replacing 80,000 mmBtu/yr of natural gas (60%)
 - 1,000,000 kWh/year renewable electricity generated
 - 5,200 mtCO₂/year carbon offset

