Oakland University Clean Energy Research Center – Rochester, MI

Background
The Clean Energy Research Center (CERC), located on Oakland University's east campus in Rochester, Michigan, is part of the business incubator, OU INC. The facility includes the 20,000 square foot Shotwell-Gustafson Pavilion, part of the historic Meadowbrook Estate. The local environment creates a safe place for entrepreneurial activities from both the local community and from within OU. The CERC and OU INC offer a platform for student and faculty R&D and facilitate technology transfer and commercialization of new technologies.

With funding from Oakland University, the U.S. Department of Energy, the Southeast Michigan Resource Conservation and Development Council and OU, the project replaced an aging steam boiler system, added direct digital controls (DDC) and upgraded lighting to electronic T8, induction and LED. Educational components include demonstration of the Viessmann wood chip boiler, a 30 HP biomass pellet mill and biodiesel and ethanol production.

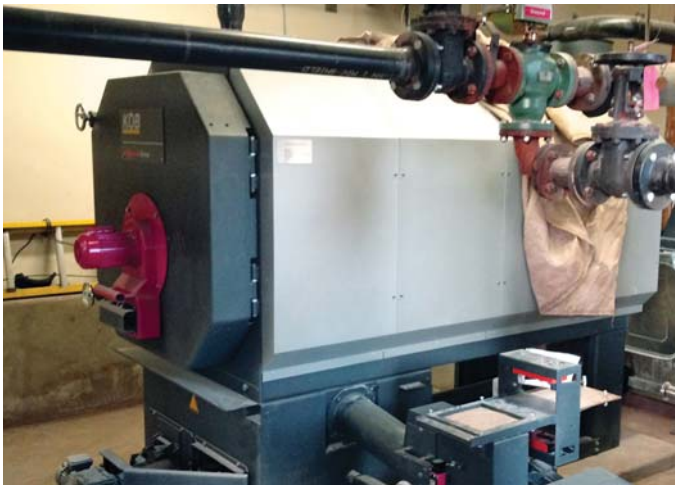
The CERC's Shotwell-Gustafson Pavilion/OU INC facility had an outdated, inefficient steam heating system

The Viessmann Solution
The original steam heating system was replaced by a state-of-the-art Viessmann Pyrot biomass boiler with a wood chip fuel storage and feed system.

Installation Details
Following the removal of the old steam system, contractors installed a Viessmann KOB Pyrot KRT-300 wood-fired boiler (rated at 300 kW thermal). The Pyrot boiler uses Oakland University-derived wood from the 1,400-acre semi-wooded campus.

The processed wood chips are placed in a wood chip receiving bin, which utilizes a feed auger to fill a 15-foot diameter steel storage silo adjacent to the building. A second, fully-automated auger feed system transports wood chips from the storage silo to the boiler, ensuring a constant fuel supply. A 700 USG buffer tank receives the heated boiler water and serves to smooth out the building heating load.

The Pyrot boiler has an 8:1 turndown ratio, automatic start/stop operation and clean, efficient combustion with exhaust gas recirculation and O_2 trim on combustion air. Heated water serves unit heaters in the pavilion space as well as heat pumps located throughout the OU INC offices.



The retrofitted Viessmann Pyrot KRT-300 biomass boiler utilizes sustainable wood fuel for clean-burning and economical heating

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A gas-fired boiler and rooftop heating and cooling unit provide backup during biomass boiler maintenance or periods of peak heating demand. The entire system is managed by DDC controls installed as part of the facility's extensive HVAC upgrades. The Viessmann boiler's operation and parameters are monitored via Modbus by operators at the central campus heating plant.

The Results

Oakland University's new biomass boiler system serves multiple purposes. It not only provides clean and efficient space heating for the CERC's Shotwell-Gustafson Pavilion OU INCubator facility, but it also plays an integral role in Oakland University's educational demonstration system while serving as a model for renewable energy use in the region. OU will use the system to show engineering consultants, contractors, and facility owners that biomass systems are viable, clean, and efficient where there is access to locally derived biomass fuel supply. For more information, visit www.oakland.edu/CERC.

Project Details

Project Year	2011
Equipment	Pyrot KRT-300
Rated Output	1024 MBH / 300 kW
Viessmann Representative	The Dale Prentice Company, Oak Park, MI
Mechanical Contractor	Johnson & Wood, LLC, Burton, MI
Engineering Consultant	Matrix Engineers, Lansing, MI

A wood chipper running on the University's own biodiesel prepares wood fuel for the boiler


A receiving bin and feed auger fill a 15-foot diameter storage silo adjacent to the boiler room

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