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Steam Plant to be Replaced by Biomass

Oak Ridge National Laboratory (ORNL) moves to the forefront of a greening trend moving across all business sectors with an \$88.1 million plan to replace its steam plant with one fueled by wood chips and launch a comprehensive program of energy efficiency improvements. That's according to the company that's helping get the job done. Iain Campbell, vice president at Johnson Controls, a Milwaukee, Wisconsin based firm that is managing and financing the initiative with Oak Ridge Laboratory officials, stood in front of the lab's antiquated steam plant to promote the project that was announced by the Department of Energy in August.

It is the largest of four such efforts being rolled out at national laboratories across the country. Department Of Energy (DOE) has mandated a reduction of energy consumption by 30 percent and water consumption by 16 percent at its facilities by the end of fiscal year 2009. At Oak Ridge, the new system and other improvements are expected to reduce energy consumption by 50 percent and water usage by 23 percent. The system will reduce fossil fuel consumption by more than 80 percent. That's the equivalent of pulling 2.1 million cars off the road every year - or planting 32 million trees, according to figures provided by Oak Ridge National Laboratory. In exceeding energy savings goals set by DOE, Oak Ridge is "charting a course for others to follow," Campbell said at the event.

The biggest component of the project at Oak Ridge Laboratory is a \$40 million super boiler to be fueled by waste wood and wood products rather than the natural gas and heating oil used now. The new boiler system will require construction of two new buildings, a 10,000-square-foot structure for the boiler system and another 14,000-square-foot facility for handling the biomass. Both buildings will be located on the central campus behind the lab's existing steam plant, which is also to be refurbished as part of the project. Wood that will fuel the Cleaver Brook super boiler will come from suppliers within a 50-mile radius of Oak Ridge. The boiler will use waste wood products only, said David Peters with Johnson Controls. That could include waste tree bark from timber mills or refuse from pallet manufacturers.

The project is expected to generate at least \$8 million in energy cost savings per year, under terms of the 18-year financing arrangement that savings will go to Johnson Controls to pay for the improvements. Other savings from reduced maintenance and operations on the new system are expected, said Jeff Smith, Oak Ridge Laboratory Deputy for Operations. Additional components of the contract include decentralization of the steam system, advanced electricity metering and energy awareness training, lighting upgrades, water conservation, mechanical upgrades and energy surveys. The payback periods for the specific projects vary from one to just over 17 years, with an average payback of about 11 years.

The contract with Department of Energy for Oak Ridge Laboratory is one of Johnson Controls larger projects, although the company has installed similar biomass-fueled systems at the University of South Carolina and at a manufacturing facility in Denmark. The public sector is taking the lead in energy savings investments because governments can accommodate longer payback periods than commercial sectors such as retail, Campbell said. That, in turn, is driving down the cost of the technology so that other industries can follow suit.