



# University of Central Missouri

*Trane upgrades guarantee more than \$735,000 annual savings • Warrensburg, Missouri*

In the spring of 2009, the University of Central Missouri (UCM) embarked on a \$36.1 million energy savings contract (ESCO) with Trane. The ESCO addressed \$20 million in needed but deferred maintenance, and \$16.1 million in energy efficient upgrades on the campus. Construction was scheduled to last through the spring of 2011, but the project will be completed in the fall of 2010, six months ahead of schedule. By June of 2010, 100 percent of the lighting retrofits were complete and the geothermal heating/cooling system was fully operational. These projects have already generated \$500,000 in energy and operating cost savings before project completion.



The University of Central Missouri offers 150 study programs on a beautiful campus serving more than 11,000 graduate and undergraduate students from forty states and more than fifty countries. Founded as a teacher's college in 1871, UCM has maintained a commitment to excellent teaching. UCM has 437 full-time faculty members, 68 percent with a PhD or other terminal degree. The student-to-faculty ratio is 17:1 and the average undergraduate class has twenty-two students. UCM's six-month job placement rate for undergrads is 94 percent. Graduating students also benefit from one of the lowest student debt ratios in the state. (Photos courtesy of UCM Photo Services.)



*The \$36.1 million ESCO at the University of Central Missouri will save 31 percent in energy costs and is designed for USGBC LEED Silver certification, progressing to Gold certification. (UCM Photo Services.)*

## **Challenge**

The University of Central Missouri campus was facing approximately \$20 million in priority deferred maintenance costs--with only an annual budget of \$2 million available. "Some of the equipment and facilities on campus hadn't been touched in anywhere from twenty to eighty years," said Dr. Betty Roberts, UCM Vice President for Administration and Finance. "Some of the equipment was so old we were forced to stockpile spare parts. We had a ten-year plan, but with only \$2 million annually we could never catch up. Complaints from students and faculty were rampant!

"We started talking to various ESCOs (energy service companies) about our problems, but their solutions were what I called 'bleeding edge'--not 'leading edge.'"

"We were spending so much money on reactive emergency projects--a generator went out or a boiler went out--and I began to assess how

much cost, how much labor was being put into those efforts. We had not received any funding from the state for capital appropriations in at least ten years. So it was: how do I make a change for the benefit of the institution--the students, the faculty, the staff--and create a positive learning environment with no money?"

No less important to UCM's goals is the fact that a 2008 Princeton Review survey showed that 63 percent of college applicants are looking for a green campus. And, according to the "Greening America's Schools" report, test scores improve by as much as five percent among students in a high performance classroom.

## **Solution**

Dr. Roberts adds, "I realized that the status quo would simply perpetuate the issues. Then I was introduced to Chad Remboldt, Education Consultant at Trane in Kansas City. He started talking about our issues, instead of ongoing repairs."



*The UCM ESCO is projected to reduce CO2 emissions by 7,500 tons, equivalent to removing 1,381 cars from roads or adding 1,714 acres of CO2 sequestering forest. (UCM Photo Services.)*

In addition to student and faculty complaints, impetus for a campus-wide systems upgrade came from the fact that UCM was a signatory to the American College and University Presidents Climate Commitment. With that and the support of the UCM President and the Board of Governors, plus organizations like Second Nature and the Clinton Climate Initiative, and a Missouri State statute that allowed UCM to initiate an ESCO performance contract project, Dr. Roberts began the effort to upgrade the campus. The supplier selection process was open to Missouri State prequalified ESCOs to submit a proposal.

Trane representatives inspected every building and system on campus to develop a solid, all-encompassing proposal for UCM. The Trane proposal included:

- Installation of 150 geothermal wells for high-efficiency heating and cooling of three main buildings on the UCM campus.
- Energy conservation measures including new windows and roofs on some buildings
- Installation of high-efficiency lighting throughout the campus
- Replaced the outdated, unsightly power plant and boiler system with a green, sustainable geothermal heat pump system
- Improved air handling systems and acoustical improvements
- Laboratory air systems and controls
- Life safety measures
- A campus-wide building automation system to effectively manage energy use

An innovative feature of the Trane package includes “green screens” throughout the campus to educate the faculty, students and the community on the University’s sustainability initiatives--and learn what they can do to make a difference and get involved in efforts toward becoming a carbon-neutral campus.

### Results

Dr. Roberts said of the decision to select Trane as the ESCO, “Trane went the extra mile and truly evaluated all of the opportunities. Their

### Key UCM upgrades

- Energy-efficient HVAC systems and geothermal heating/cooling
- Energy-efficient lighting
- Improved indoor air quality and air handling systems
- Classroom and office acoustical improvements
- Campus building automation and life safety systems
- "Green" touch screens to educate students and community on UCM sustainability initiatives
- New roofs and windows on selected buildings



150 geothermal wells were installed under a parking lot to provide high efficiency heating and cooling using the earth's own renewable heat as an energy source. (UCM Photo Services.)

proposal was one of the most thorough responses I've ever seen. But I knew that the project would be challenged and so we had three outside engineering firms study and validate the Trane proposal."

Dr. Roberts also submitted the proposal for an investment grade audit. UCM now has a sustainable, high performance campus and will see \$735,000 in annualized consumption savings, \$848,000 in operating and maintenance savings, and \$1.5 million in avoided annual capital improvements. Dr. Roberts said, "This project has more than exceeded my expectations. Trane brought together phenomenal subcontractors who were very accommodating and worked around classes and campus events. Even when there were issues outside the scope of the performance contract, those were addressed. I recently took the Board of Governors for a tour of the campus and I must say there was very much a sense of happiness over the results of this project. It is very easy to see where the money went. We're very happy!"

Trane is providing a fifteen-year select maintenance agreement for the heat pumps that includes seasonal inspections and maintenance to ensure proper, efficient

operation and covers parts and labor for repairs to maintainable components over the life of the performance contract. A Trane controls service agreement includes monthly system reports to UCM, semi-monthly system reviews, remote inspections and diagnostics, software updates and staff training. UCM operators will regularly interact with Trane automation specialists for continued controls proficiency training. UCM has the option to continue this service after the first year of operation.

Along with the green upgrades, UCM students and faculty made Earth Day 2010 a week-long celebration. Events with the theme "Change your behavior, change our world!" included establishing a nature trail and removing a pile of debris and trash from the surrounding areas. Dr. John Hess, UCM professor emeritus of biology and earth science, delivered a speech and led a discussion titled, "It's All Around Us." Other events included the "Haute Trash Fashion Show," where students, faculty and staff modeled clothing made of recycled materials, plus lectures, films, a green luncheon and a keynote address by actor and environmental activist Ed Begley, Jr. Dr. Steven Boone, UCM interim Dean of the College of Arts, Humanities and Social Sciences and chair of the Earth Day planning committee, said, "Trane's commitment to education and green initiatives has been above and beyond what we could have expected, and we sincerely appreciate them for all they have done and will continue to do."



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