Case Study

# University of Massachusetts Amherst

Johnson Controls


## The challenge: Make campus-wide improvements to reduce energy costs and meet sustainability goals

The University of Massachusetts (UMass) Amherst has a long, proud history dating back to its founding in 1863 as an agricultural college. Today Amherst is the flagship campus of the University of Massachusetts system with nearly 20,000 undergraduate students, more than 5,000 graduate students and an international reputation for academic excellence. To maintain that reputation and continue attracting the best and the brightest, the University had to improve its buildings and make its academic environment and campus the best it could be. At the same time, the University was faced with tight budget constraints, rising energy costs and a substantial backlog of deferred maintenance. To overcome these challenges, leaders needed to improve energy efficiency and reduce operating costs.

## The solution: Comprehensive energy and water conservation improvements

UMass worked with Johnson Controls to identify measures that would have a positive impact on energy and water consumption and at the same time improve building occupant comfort. The resulting customized $40 million performance contract – covering equipment, upgrades and building infrastructure improvements – was designed to deliver $55.5 million in savings over 10 years. Lighting throughout the campus was upgraded with more energy-efficient technologies. Electric power generation capabilities were increased from 2 to 3.9 megawatts by upgrading the aging back-pressure steam generator with a new efficient one. Other improvements included making heating systems more efficient by replacing failed steam traps to reuse steam rather than let it simply escape unused, and replacing old, leaking steam pipes throughout the campus. Water conservation measures included installing low-flow fixtures on

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sinks and toilets to reduce water usage, and recycling effluent water from the town of Amherst wastewater treatment plant through reverse osmosis and reusing it for make-up water at the power plant. Additionally, a Metasys® building management system was deployed to integrate and control electrical and mechanical systems for maximum efficiency and comfort.

Two Johnson Controls professionals work on site full time to ensure the equipment is performing properly and delivering the savings the University expects.

The University's quest for efficiency and sustainability includes raising awareness and involvement among students, faculty and staff to conserve energy and water. Outreach programs consist of dorm competitions to see which saves the most energy, and door hangers with energy and water conservation tips distributed to every student. Kiosks and special software display real-time energy use in four dorms, as well as how much electricity the campus purchases and produces and the amount of CO2 discharged into the air by the power plant.

## The results: $55.5 million in expected savings

The $40 million worth of retrofits, upgrades and other improvements are projected to save the University $55.5 million over the 10-year contract term. In fiscal year 2009 alone, water conservation projects enabled the University to reduce water consumption by 22 million cubic feet, which is equivalent to 40 percent of its 2003 consumption, while energy efficiency projects and use of green technologies resulted in the University reducing carbon dioxide emissions by more than 21,000 metric tons. As a result of its achievements in energy efficiency and sustainability, UMass Amherst received the Massachusetts Environmental Purchasing and Sustainability Award in 2006. Using the savings from

these projects, the University was able to implement improvements to create learning environments that foster academic excellence. In short, UMass Amherst is a campus that works.

Contact us to learn more about how we can make your building work more efficiently, sustainably and profitably.