

2009 Case Study

Kansas State University

Intern: Conner Whitney
Major: Chemical Engineering
School: Kansas State University

Manhattan Kansas



Company background

Kansas State University is public university located in Manhattan, Kansas, residing in 88 buildings on roughly 670 acres. The university houses many different colleges, ranging from agricultural, military science, and veterinary medicine, to engineering. More than 23,000 students and 3,000 employees call Kansas State their home or work place.

Project background

The main focus of the projects presented for Kansas State University were in electricity. The two main projects investigated were motion sensors for the lighting in the recreational complex and replacing the window air-conditioning units in Waters Hall.

Incentives to change

Kansas State University is a heavy user of resources in Manhattan. From July 2008 to June 2009, the main campus used 91,756,256 kWh of electricity, amounting to \$5,977,669. Whether it's lighting classrooms, watering the grounds, or cooling offices, K-State is constantly looking for ways to lessen its impact on the environment. Recently appointed President Kirk Schulz has voiced his support for molding Kansas State into a sustainability leader. He has paired with Dr. Ben Champion, director of sustainability, in ushering in a new sustainable future for the university, one that will reposition it as a pollution prevention leader in the Midwest. Kansas State University, now more than ever, has a great opportunity to reduce its environmental impact. The university has partnered with the Pollution Prevention Institute to allow an intern to help discover ways to cut down on resources and make Kansas State an energy-efficiency leader.

Projects reviewed for E2/P2 potential

1. Peter's Recreational Complex lighting

The Peter's Recreational Complex is a hub for all facets of student interests. There exist, however, areas of the complex that don't receive as much use. I suggest these areas operate under occupancy

sensors for their lighting needs. These areas include, but are not limited to, the men's and women's locker rooms, racquetball courts, and ping pong room. Current hours of operation coupled with the types of bulbs these rooms use cost the recreational complex \$13,200.43 annually for operation.

2. Waters Hall window air-conditioning units

Waters Hall currently has 192 window-mounted, air-conditioning units in use. Four different models, by Friedrich, are currently used by the state of Kansas and thus Kansas State University. Of the four, only two are Energy Star-rated. Use of these window-mounted, air-conditioning units is supplemented by a centralized air-conditioning system. Assuming a mixture of all four units, the university spends \$44,059.13 on electricity to supply the window units with energy. Add that cost to the price of the window A.C. units and overall costs quickly add up. When cooling buildings as large as the ones at the university, even a few degrees of temperature difference for cooling systems can add substantial costs. Using a hypothetical cooling unit, sized for one campus building, approx. 20,000 CFM, I performed a cost comparison of one A.C. unit cooling to 75 F and the other to 72 F. The cost difference was approximately \$43 thousand annually.

3. Energy savings calculator

Kansas State University is, as of July 2009, in discussions with Energy Education, a company with programs designed to reduce energy consumption. It was desired to create a calculator capable of determining the accuracy of quotes given by Energy Education. The intern created a tool, given the number of cooling tons required, that would estimate Kansas State University's annual cooling costs and aid with the determination.

Summary of 2009 E2/P2 intern recommendations for Kansas State University

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Peter's Recreational Complex lighting	110,003.6 kWh	\$6,600.22	In progress
Waters Hall window air-conditioning units	491,993.7 kWh	\$29,519.61	In progress
Total savings *	601,997.3 kWh	\$36,119.83	
GHG reductions *	427.6 metric tons CO2e		

* Does not include projects that are "not recommended" or "further research is needed."