

2010 Case Study

Johnson County Community College

Intern: Chase Davisson
Major: Electrical Engineering
School: Kansas State University

Kansas City, Kansas



Company background

Johnson County Community College (JCCC), Overland Park, Kansas is comprised of 20 buildings on more than 234 acres. The college provides a wide selection of more than 50 degree and certificate programs. With more than 35,000 credit and continuous education students and 2,770 full- and part-time staff, JCCC is the third-largest institute of higher education in the state of Kansas.

Project background

JCCC selected three projects for the intern, Chase Davisson, to investigate. The goal of these projects was to reduce environmental impacts by reducing energy consumption and increasing efficiency of day-to-day college operations. Projects selected were as follows: research of VendingMisers for vending machines, replacement of V-belts with cogged V-belts on select air-handler units, and monitoring of baseline energy usage.

Incentives to change

Johnson County Community College decided to participate in the Pollution Prevention Institute intern program in order to continue its environmental stewardship efforts, as well as to reduce its operating costs.

Projects reviewed for E2/P2 potential

1. *Vending Machines*

JCCC, at the intern's last count, has 47 refrigerated soda machines and 26 non-refrigerated snack machines. These machines operate 24 hours a day and use a combined total of 173,986 kWh, costing \$12,179 annually. Research was therefore begun by the intern to find a way to reduce the energy consumption. The best solution, according to Davisson, turned out to be a product called VendingMiser. VendingMisers have the potential to reduce energy consumption, per machine, by greater than 40%. Therefore, savings of greater than 73,571

kWh and \$5,150 annually could be achieved through use of VendingMisers.

2. *Belt Replacement*

Cogged V-belts are in use on campus in many areas. However, Davisson discovered that nine air-handler units were not currently using cogged V-belts but were instead using standard V-belts. The potential benefit of switching to cogged V-belts was found to be at least a 2% increase in efficiency, as well as a cooler and longer-lasting life of the belt. Davisson determined the college could save 21,521 kWh and \$1,506 per year over the current consumption of 703,015 kWh, costing \$49,211 annually, by switching to cogged V-belts. He recommended belt replacement on all nine air-handler units. The college has agreed and belt replacement is currently in progress.

3. *Baseline Energy Usage*

Before Davisson's arrival, JCCC had 19 power meters monitoring 17 of its 20 buildings. These power meters were never used to detect usage of nighttime loads. The intern graphed usage of all the meters for a one-week period and looked for the building with the highest nighttime usage. He then used the JCCC building automation system to look over this building's scheduling for air handler units and lighting. After rescheduling certain air-handler units and lighting, new power usage graphs were made for a one-week period. Results showed a 47,040 kWh and \$3,293 annual reduction from the previously recorded 301,840 kWh and \$21,129 annual usage. It is hopeful that future additional research into building automation systems will result in even further energy and pollution savings.

Summary of 2010 Intern Recommendations for Johnson County Community College

| Project | Annual Cost Savings | Environmental Results | Greenhouse Gases (CO₂e standard tons) | Status |
|-----------------------|----------------------------|------------------------------|---|---------------|
| Vending Machines | \$5,150 | 73,571 kWh | 62.4 | Recommended |
| Belt Replacement | \$1,506 | 21,521 kWh | 16.5 | In Progress |
| Baseline Energy Usage | \$3,293 | 47,040 kWh | 36.8 | In Progress |
| Total | \$9,949 | 142,132 kWh | 115.7 | |