

2010 Case Study

Green Lodging circuit rider

Intern: Creighton Miller
Major: Chemical Engineering
School: University of Kansas

Greater Kansas City



Company background

Miller visited 13 hotels including Candlewood Suites, Chateau Avalon, Comfort Suites, Courtyard by Marriott, Embassy Suites, Fairfield Inn and Suites, Hyatt Regency Crown Center, Residence Inn, Sheraton, Sleep Inn, and Springhill Suites. Size of hotels ranged from 62 to 731 rooms. The lodging facilities were located on both the Kansas and Missouri sides of Kansas City.

Project background

The 2010 Green Lodging Circuit Rider Intern, Creighton Miller, conducted brief energy efficiency and water conservation assessments at 13 facilities in the greater Kansas City metropolitan area. These assessments were designed to help facilities identify opportunities for environmental and cost savings. The circuit rider internship is provided by the Pollution Prevention Intern Program and funded through a grant from EPA (Environmental Protection Agency) Region 7.

Incentives to change

The hospitality industry is resource-intensive, spending close to \$4 billion on energy every year,¹ with the average hotel using 21,537 gallons of water per day². In fact, the average hotel uses 218 gallons of water a day per occupied room according to the California Integrated Waste Management Board, and related studies estimate the hospitality industry can reduce water and sewer bills by 25-30% simply through use of water-saving programs and devices³. Reducing water consumption naturally reduces energy demand and then has a favorable environmental health impact on our communities, region, and environment. According to Energy Star, reducing energy use by 10% across the hospitality industry would save \$745 million annually⁴.

Many hotels have standardized room layouts and features; this makes implementing a change across all hotel rooms easier, while quickly multiplying energy, water, and cost savings.

Projects reviewed for source reduction potential

1. Lighting

In most lodging facilities visited during summer 2010, hotels had already begun the movement to high-efficiency lighting such as compact fluorescent (CFL) light bulbs in guest rooms; T8 fluorescent lighting in hallways, stairwells, and other sections of the building; and LED emergency exit lighting. Occupancy sensors were also evaluated in some areas of hotels, including hallway restrooms, gyms, and snack rooms.

If all recommended lighting projects were implemented, these hotels would save an estimated total of \$83,000 and 990,000 kWh of energy annually.

2. Updating appliances

Appliances in some hotels were evaluated (such as guest room refrigerators and dishwashers, ice machines, and kitchen hoods). In most instances, the payback period for updating this type of equipment was too long to justify an immediate replacement; replacement of current equipment, as it failed, with higher efficiency products was recommended. This was a good example of making wise purchase decisions in the beginning, as a retrofit to higher-efficiency equipment could not easily be justified.

Based on savings data from vendors, kitchen hoods were found likely to have a reasonable return on investment. Total annual savings by

installing kitchen hoods was estimated to be \$4,500 and 50,000 kWh of energy.

3. Installing faucet aerators

Faucet aerator installation projects were found to have a very short return on investment, often only after a period of a few months. A 0.5-gallon-per-minute (gpm), laminar-flow aerator costing \$2.20 was assumed. Multi-stream laminar-flow aerators do not add air to the flow, and consequently do not lower the temperature of the water. Because of this design, these aerators are unlikely to frustrate guests or be perceived as having too little water pressure. With a low cost per unit and quick installation time, faucet aerators are a common-sense project that every hotel should consider.

If installed at all hotels visited, an estimated annual savings of 3,304,500 gallons of water and \$24,950 would be realized.

4. Installing low-flow showerheads and dish sprayers
Retrofitting existing showers with low-flow showerheads was recommended for all hotels

which did not already have high-efficiency fixtures installed. For purposes of estimating cost and savings, a 1.0-gallon-per-minute (gpm) showerhead costing approximately \$46.00 was assumed; typical payback period for this project was under two years. Other low-flow showerheads (such as those with 1.5-gpm flow rates or other special looks or finishes) could extend the payback period.

If installed in area hotels, low-flow showerheads could save facilities 4,493,800 gallons of water and \$33,600 annually.

Total savings from all recommended projects at area hotels (if implemented) would be —

- 1,040,000 kWh of energy
- 8,026,000 gallons of water
- \$144,630
- 935 metric tons CO₂e (carbon dioxide equivalents)

Summary of 2010 Green Lodging Intern recommendations for Kansas City-area hotels

Project description	Annual estimated impact	Annual estimated cost savings	Status
Lighting (guest room)	431,700 kWh	\$36,300	Recommended
Lighting (hallways, stairwells, lobbies)	299,250 kWh	\$26,300	Recommended
Lighting (other guest areas)	254,700 kWh	\$20,000	Recommended
Lighting (mgmt/maintenance areas)	6,060 kWh	\$533	Recommended
Appliances	50,000 kWh	\$4,500	Recommended
Water (kitchen/dish sprayers)	227,600 gal	\$1,500	Recommended
Water (faucet aerators)	3,304,500 gal	\$24,950	Recommended
Water (showerheads)	4,493,800 gal	\$33,600	Recommended

¹U.S. EPA, Energy Star, www.energystar.gov/ia/business/hospitality/factsheet_0804.pdf

²Southwest Florida Water Management District, www.swfwmd.state.fl.us/conservation/waterwork/checklist-hotel.html

³California Integrated Waste Management Board, www.ciwmb.ca.gov/EPP/greenlodging/

⁴U.S. EPA, Energy Star for Hospitality, www.energystar.gov/index.cfm?c=hospitality.bus_hospitality