2010 Case Study

The Coleman Company, Inc.

Intern: Aakash Amatya
Major: Electrical Engineering
School: Wichita State University

Wichita, Kansas

Company background
The Coleman Company, Inc. is one of the world's leading manufacturers of outdoor equipment and camping gear, such as coolers, tents, stoves, sleeping bags and lanterns. The Northeast Factory in Wichita, Kansas manufactures the ever-popular Coleman coolers and legendary lanterns. The Coleman Company, Inc. is a wholly-owned subsidiary of Jarden, which is comprised of manufacturing, marketing, distribution and sales operation in 13 countries around the world and has been conducting business on international level since 1916.

Project background
Aakash Amatya's internship consisted of energy efficiency projects, as well as a water conservation project. These projects included a lighting retrofitting analysis for the customer service section, an economic and energy analysis of metal-halide (MH) retrofitting options, a boiler efficiency assessment/ replacement, a Rotovac system water conservation analysis, and an energy assessment of the blow-mold grinders.

Incentives to change
This was the first time the Coleman Company had participated in the Kansas State University intern program, clearly showing the facility's interest in creating an energy-efficient and environment-friendly workplace.

Projects reviewed for E2/P2 potential

The first project involved lighting retrofitting analysis for the customer service section. This section had 450 light fixtures, using T12 fluorescent lamps with magnetic ballasts. These fixtures consumed an estimated 322,769 KWh annually, costing $19,366 per year. Amatya suggested retrofitting the existing conventional T12s with energy-efficient T8s and replacing existing magnetic ballasts with electronic ballasts for an operation cost reduction. This project will create an estimated annual energy savings of 120,842 KWh per year and $7,250 annually in cost savings.

The second project involved replacement options for existing 400W MH fixtures in the facility. Conventional 400W MH with magnetic ballasts are used throughout the facility. Amatya researched four retrofitting options for the metal-halides and calculated estimated energy and cost savings for each option. The options considered were (1) use of 360W MH (2) use of 320W pulse-start MH on electronic ballasts, (3) use of four-lamp, T5 high-bay fixtures, and (4) use of six-lamp, T8 high-bay fixtures. Amatya recommended implementation of option 3 or 4. On the basis of one-on-one replacement, the facility will see estimated energy and cost savings of 1,220,986 KWh and $73,259, respectively, from option 3, and estimated annual energy and cost savings of 1,107,088 KWh and $66,425, respectively, from option 4.

The third project was associated with the boiler energy-assessment/replacement analysis. The facility used a natural gas Scotch marine boiler, which was highly oversized for the process it was supporting. Thus, the boiler was operating at a very low efficiency level and was creating additional costs for the facility. Amatya estimated the appropriate boiler size for the process and recommended replacement of the Scotch marine boiler with a newer more correctly sized electric boiler. By implementing this project, the facility will see estimated savings of 29,747 MSCF of natural gas and $166,419 in operating costs annually.

The fourth project dealt with the study of a water-saving opportunity involving the existing Rotovacs in the facility. The Rotovacs use city water for cooling, and as soon as the water reaches a temperature of 115^0F, it is drained off, even if free of any chemical contaminants. Amatya recommended the facility collect the cooling water instead of draining it off, then

using it as intake water for the cooling tower on-site. By doing this, the facility could save approximately 9,358,235 gallons of water per year.

The fifth project was associated with an energy assessment of the blow-mold grinders in the facility. At Coleman, whenever the blow-mold machines were operating, the grinders remained on even if they were not loaded. Instead of operating the grinders all the time, Amatya recommended the facility collect the material to be ground in a separate container and grind it at a specific time. This would not only save energy costs for the facility, but would also improve the efficiency level and duty cycle of the grinders.

Table 1: Summary of 2010 Intern Recommendations for The Coleman Company, Inc.

Project Title	Environmental Impact	$MTCO_2e$ reduction	Estimated Cost savings/ year	Status
Customer Service Section Lighting	120,842 KWh	85.836	$ 7,250	Recommended
Existing Metal Halide Replacement				
Option I: 360 W MH on existing ballast	182,237KWh	Not evaluated	$ 10,934	Not Recommended
Option II: 320 W MH Pulse Start	496,595 KWh	Not evaluated	$ 29,796	Not Recommended
Option III: Four-lamp high-bay T5 fixtures	1,220,986 KWh	867.262	$ 73,259	Recommended
Option IV: Six-lamp high-bay T8 fixtures	1,107,088 KWh	786.379	$ 66,425	Recommended
Boiler efficiency/replacement	29,747 MSCF of Natural gas	1,625.147	$166,419	Recommended
Rotovac system water conservation	9,358,235 gal.	21.936	Not evaluated	Recommended
Blow-mold grinder energy assessment	Not evaluated	Not evaluated	Not evaluated	Recommended
Total	1,341,828 kWh (Option III) or 1,227,930 kWh (Option IV) 29,747 MSCF 9,358,235 gal.	3386 $MTCO_2e$	$ 313,353	