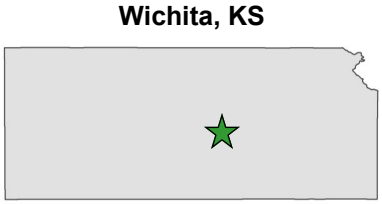
2015 Case Study

The Coleman Company, Inc.

Intern: Jacquelyn Sommers
Major: Architectural Engineering
School: Kansas State University



Company background

From its timeless lanterns, historical compact stoves and top-of-the-line coolers, the Coleman Company, Inc. has been one of the top outdoor equipment manufacturers for many years. This company is continually spreading its name across the world with the manufacturing, marketing and distribution of its products in 13 countries. The Coleman Company, Inc. became a subsidiary of Jarden Corporations in 2005 and since then has expanded its markets even further. Since Coleman has made huge steps in its industry, its outdoor company wants to take steps to become more sustainable and efficient in its processes, so its customers can enjoy Coleman products and the outdoors for many years to come.

Project background

Jacquelyn Sommers' internship consisted of water conservation and energy efficiency projects, which included a Rotovac water-reuse analysis, compressed-air audit, economic and energy analysis of a metal-halide retrofit, comparative study of AC vs DC motors, and heat mitigation tests on assembly lines. The intern worked closely with the facilities and maintenance departments to gain data and research for these projects.

Incentives to change

This is the second year Coleman's northeast factory has teamed up with the Pollution Prevention Institute's summer intern program. The previous intern, Aakash Amatya (2010), was able to save Coleman more than $130,000 and 29,700 MSCF of natural gas through the replacement of an oversized steam boiler with a more appropriately sized electric boiler. Coleman wanted to capitalize on Amatya's success by having another intern research other energy and cost-saving projects.

P2 Projects

The first task Sommers undertook was a Rotovac water-reuse project. The Rotovac machines had a single-loop chilling system; if the water reached above a certain temperature, it was immediately drained off. Sommers installed a water meter on the drain of one of the Rotovac machines for a week and calculated a total of 10,154,700 gallons of water were being drained off each year from these machines. By adding in a second water loop and connecting it to a chiller, Coleman will be able to reuse the water which would otherwise be drained off. This will give them an annual savings of 10,154,700 gallons of water and $72,000

Sommers's second project was a compressed-air audit. Due to a lack of time, the intern completed only a partial air audit on Coleman's air compressors and blow-mold machines. Using an ultrasonic leak detector, she found a total of 85 leaks. If these leaks are repaired, Coleman will have an energy reduction of 521,400 KWh and a cost avoidance of $40,500. Sommers also found an energy reduction of 35,600 KWh and an annual cost savings of $12,400 if Coleman replaces its existing compressed-air dryers with new and more efficient air dryers.

Sommers worked with the facilities department on a metal-halide retrofit project. Coleman's

northeast factory had 732, 400W metal-halide fixtures, and they wanted to replace them with 150W LEDs. Sommers took data readings to compare the LEDs to the metal halides. She found the lumens, or brightness, for the LEDs to be more than two times greater than the metal halides. The temperature of the LED lamps was 50% less than the metal-halide lamps. Sommers calculated an annual energy savings of 1,768,300 KWh and an annual cost savings of $137,200, if all 732 metal-halide fixtures are replaced.

The fourth project Sommers worked on was a comparative study between AC and DC motors. In 2011, Jose Hernandez, maintenance engineer, took data readings on multiple DC motors around the plant to find out their energy consumption and power factors. Coleman wants to raise its power factor to .9 and thus decrease the penalty charge from Westar Energy. One of the DC motors Hernandez logged data for was on Sheet Line 2 and had a power factor of .52. The motor on Sheet Line 2 was replaced with an AC motor in December 2014. Sommers logged data on the AC motor to find the power factor had increased to .83. From this replacement alone, Coleman had a 21% energy cost savings. When the Sheet Line 1 DC motor needs to be replaced with an AC motor, Coleman will have an annual energy savings of $18,100 and an energy reduction of 187,100 KWh.

The final project Sommers worked on was heat-mitigation tests on the assembly lines. She found the average ambient temperature on assembly lines with spot cooling was 12 °F cooler than assembly lines with fan cooling. Sommers gave Coleman several recommendations on how to keep its spot cooling efficient and most effective for its workers.

Table 1: Summary of 2015 Intern Recommendations for The Coleman Company, Inc.

Project Title	Annual Cost Savings	Environmental Impact	MTCO2e Reduced	Status
I: Rotovacs water reuse	$72,000	10,154,700	32.8	Recommended
II: Compressed-Air audit	$40,500	521,400 KWh	509.8	Recommended
IIA: Air dryer	$12,400	35,600 KWh	34.8	Partially implemented
III: Metal-Halide replacement	$137,200	1,768,300 KWh/yr	1,729.6	Partially implemented
IV: AC vs. DC comparative study	*$18,100	*187,100 KWh	*183.0	Partially implemented
V: Heat mitigation	NA	NA	NA	Partially implemented

Summary table of pollution prevention projects

* only includes energy savings on Sheet Line 1.