

2013 Case Study

SPX Cooling Technologies, Inc.

Intern: Dana Bloom
Major: Mechanical Engineering
School: Kansas State University

Olathe, Kansas



Company background

SPX Cooling Technologies, Inc. is a leading full-line and full-service manufacturer of cooling towers and air-cooled condensers. SPX is comprised of several companies who were founded more than 100 years ago and hold more than 250 global patents in areas such as power generation, industrial, refrigeration, and HVAC markets. The Olathe plant, still referred to as Marley, manufactures and assembles all cooling towers.

Project background

Dana Bloom's internship consisted of energy reduction, wood waste reduction, and wastewater reduction projects. The energy-reduction projects consisted of a compressed-air leak audit and a ceramic infrared radiator efficiency assessment/replacement. The wood waste-reduction project consisted of contacting vendors and third-party management systems in an effort to reduce and recycle wood waste throughout the facility. The wastewater project consisted of quantifying how many gallons/minute were currently being wasted. Although SPX has dedicated itself to reducing energy consumption, reducing waste generation, reducing water usage in its processes, and reducing VOC emissions, this is SPX's first time in the Kansas State University intern program.

Incentives to change

In 2009, SPX Corporation launched an environmental sustainability metrics and goal planning initiative. Participating in this program enabled SPX to better communicate its efforts to provide a healthier environment to its community.

Projects reviewed for E2/P2 potential

1. Wood waste management

The first project looked at the wood waste and its movement throughout the SPX-Olathe plant. In order to properly identify solutions, pallet alternatives, third-party recyclers, and returnable pallets through, SPX suppliers/vendors were looked at. Right now, SPX throws away an estimated 1,836,960 lbs per year in waste. Two compactors with minimal wood waste get pulled every

Tuesday of the week. Eliminating these, it can be estimated that 1,406,062 lbs of waste is being pulled through the hoppers (open-top trash bins). I have conservatively estimated that wood makes up at least 80% of waste in the hoppers, leaving SPX with 1,124,849 lbs of wood per year going to the landfill. Diverting this wood waste could save an estimated \$93,578.20 in pull charges and tipping fees. Currently, the implementation of this project has diverted 281 tons of wood waste from going to the landfill for a total of \$36,093 being saved annually.

2. Compressed-air leaks

The second project looked at compressed-air leaks throughout the facility. The plastics building and the assembly building were audited for a combined 232,000 square feet, with a total of 74 leaks found. These leaks ranged in price from \$29 - \$860 for a total of 366,529 kWh in energy savings found and 316.29 tons CO₂, 0.8965 tons SO₂, and 0.657 tons NO of reduced emissions found. In total, this reduces utility costs by \$32,987.65 annually.

3. Thermoformer energy reduction

The third project looked at reducing energy usage in the thermoforming process. Data (kWh) was collected on one thermoformer for the entire year of 2012 and it averaged 117.7 kWh. Assuming each thermoforming machine (PVC 4, 5, 6, 7, and 8) has 198 heating elements, with the exception of PVC 6 (312 elements), an estimated 3,673,727 kWh is being wasted. In order to reduce energy usage by up to 25%, it was recommended to replace the current ceramic infrared radiators with the Elstein HTS Series elements. Using these would save up to 673,458 kWh of energy and reduce 652.374 of GHG. In total, this reduces utility costs by \$60,611.30.

4. Wastewater reduction

The fourth project looked at two extruders and the wastewater in its processes. Currently, water is being pulled through its vacuum pumps and dumped down the drain. Also, once the PVC material gets extruded, it goes through a long water bath to cool down. This bath has overflow and also dumps water down the drain. For both of these extruders, there is an estimated 1,374,050 gallons of water going down the drain each year. This wastewater

amounts to about \$9,368.61 in annual costs. It is recommended that the current vacuum pump being used is replaced with a Busch Mink Vacuum Pump. Making this change will save on water costs, operating costs, maintenance costs, as well as reducing water consumption. The lower operating costs are due to its maintenance-free design along with its reduced power requirements. The lower maintenance costs are due to the vacuum pumps non-contacting design, air cooling, and dry-running features.

Summary of 2013 P2 intern recommendations for SPX Cooling Technologies, Inc.

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Wood Waste Management	281 tons	\$36,093	Partially Implemented
Compressed Air Leaks	366,529 kWh	\$32,987.65	Implemented
Thermoformer Energy	673,458.60 kWh	\$60,611.30	Recommended/In
Waste Water Reduction	976,610 gallons	\$8,399.80	Recommended
Total savings *	976,610 gal, 1,039,988 kWh, 281 tons solid waste	138,091.75	
GHG reductions *	652.374 metric tons CO2e		

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