

2016 Case Study

CST Storage Parsons, Kansas

Intern: Sarif Ullah Patwary
Major: Apparel and Textiles
School: Kansas State University



Company background

CST Industries is the world's largest provider of modular, factory-coated, bolted storage tanks for dry bulk and liquid applications for many markets. Established in 1893, CST Industries specializes in storage tanks and covers. More than 350,000 tanks and 18,000 covers, in 125 countries, have been installed by CST Industries so far. It has been doing business for the last 127, at 16 locations worldwide. CST Storage is a small unit of CST Industries located in Parsons, Kansas. It produces various components of bolted tanks, which can be used for storing a variety of items.

Project background

CST has been recruiting Kansas State University Pollution Prevention Institute interns since 2011, leading to implementation of several environmentally friendly approaches to its production line, based on recommendations of the interns. Among those projects are replacement of high-pressure sodium lights with LEDs, re-routing water in the wash/rinse operation, and installing soft-starts on air compressors, to name just a few. These initiatives contributed to better environmental health, as well as cost benefits, for CST Storage.

This year, Sarif Patwary was assigned with reducing water waste from the wash/rinse operation, saving energy in the E-room, installing an energy-efficient oven system, conducting an air-leak audit and reviewing the electricity consumption trend of the updated lighting system.

Incentives to change

CST Storage trusts in environmental well-being. It believes a corporation cannot flourish sustainably if it does not care for its people and the environment it is operating in. Since 2011, it has been recruiting interns every summer to improve its existing environmental

footprint status by investigating, understanding, and implementing environmentally-friendly technology and practices in its manufacturing lines and norms. It firmly adheres to the belief that maintaining environmental health is a continuous process. Through continuous examination and investigation, a firm can truly understand its environmental impact and take corrective actions. CST brought in another intern in 2016 as a part of its commitment of continuous improvement to the environmental care of its facility.

Projects reviewed for P2 potential

Sarif's first project was to investigate water consumption in the wash/rinse operation and find a solution to reduce water usage. After investigating the situation, he came up with several possible solutions. After feasibility tests and cost-benefit analyses of those solutions, he recommended synchronizing the different sections of the wash/rinse operation and incorporating an 'auto-stop motion' sensor. He estimated the facility could save 2,654,208 gallons of water per year, and \$42,467 per year by following this recommendation.

The E-room is where the facility applies powder coating onto metal parts. This continuously results in energy loss due to openings at both ends of the room. The intern observed that 50% of operational energy use and 100% of downtime energy use can be saved if the facility installs an automatic door system at the openings. Based on his research, the intern proposed installation of an automatic door system at both openings of the room, which would save nearly 278,868 KWh/year and \$23,146/ per year.

The intern conducted a partial analysis of CST's existing oven system using the Process Heating Analysis and Survey Tool (PHAST) software downloaded from the US Department of Energy. Following this, he recommended the facility update

the insulation and reduce openings of the ovens. Estimates show the facility can save 1,229 MMBtu/year and \$4,574/year, by following this recommendation. The intern also found a similar electric oven used by CST that five times more CO₂ and is six times more costly than the gas oven.

The intern conducted an air-leak audit throughout the shop floor and found 26 air leaks; fixing these leaks would save CST 174,774 KWh/year and \$20,973 per year. He tagged each leak and provided an 'air leaks priority list' to the maintenance staff so they would know which leaks needed to be repaired first. The intern also recommended using flow-control tools and turning the compressor off when not in use.

The intern from 2015, Jade Edmond, had recommended replacement of the high-pressure sodium lights with LED lights. Based on this recommendation, CST started implementing 12 fixtures per month, beginning in June 2015. An estimated 1,244 KWh per month was the expected electricity-use savings following the change. The intern was asked to perform a review of the electricity and cost-reduction scenario before and after replacement of sodium lights this year. After conducting a few studies, he had reasons to believe the lighting replacement played a role in reducing electricity consumption by 14,930 KWh/year, saving CST \$1,314/year.

Summary of 2016 2 intern recommendations for CST Storage

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Water loss reduction in wash/rinse operation	2,654,208 gallons	42,467	Recommended
E-Room energy loss reduction	278,868 KWh	23,146	Recommended
Energy efficient oven installation	1,229 MMBtu	4,574	More research required
Compressed-air leak audit	174,774 KWh	20,973	Recommended
Electricity usage reduction review	14,930 kWh	1,314	Implemented
Total savings*	468,572 KWh, 2,654,208 Gallons	\$87,900	
GHG reductions¹	458 metric tons CO₂e		

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

¹EPA GHG Conversion Tool_April 7 2010