2019 Case Study

CST STORAGE

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Company Background
CST Storage in Parsons, Kansas, is one of many manufacturing sites for CST Industries, which is currently the world's leading manufacturer of factory-coated bolted storage tanks, aluminum domes and specialty covers. The tanks are used for dry bulk and liquid operations in a wide array of markets. More than 350,000 storage tanks and 19,000 covers have been installed in 125 countries since the company was founded.

Project Background
Each year since 2011, CST Storage has had a pollution prevention (P2) intern to help reduce the company's environmental impact while saving thousands of dollars in annual spending. With estimated potential cost savings totaling more than $2.2 million and 3,352 MTCO2e diverted, there is no denying the impact the program has had on CST. The company has implemented many of the previous interns' recommendations over the years.
This year, the P2 intern assigned to CST Storage was tasked with researching the feasibility and environmental impact of various projects including a new pre-treatment system audit, energy savings associated with shop skylights, research on savings and ROI for solar power, and a compressed air-leak audit. On top of the assigned projects, two others were investigated: energy savings associated with switching to LED lighting for the offices and savings from using technology to limit energy waste from shop fans.

Incentives to Change
CST Storage has demonstrated its commitment to reducing its waste and pollution emissions. The facility has had a PPI intern every year since 2011 to work on projects to reduce the company's waste and cut costs in doing so. Recent projects implemented by CST include installation of a more efficient water heater for the pretreatment system, replacing high-pressure sodium lamps in the shop with LED lamps, and conducting compressed-air-leak audits to reduce the amount of electricity spent on running compressors. On top of saving CST thousands of dollars, these projects have reduced the company's waste and pollution potential while having a positive impact on showing the public its commitment to improving the company as a whole.

Projects Reviewed for P2 potential
<u>New pre-treatment system audit</u>
CST recently installed new water heaters as part of the pre-treatment system for the paint line. The intern was asked to verify current water and gas savings with the new system. Water-flow data was collected and compared to the previous intern's data over the old heaters to compute savings. Estimated annual fresh water and natural gas savings were found to be 667,656 gal and 703,449 ft^3, respectively, with cost savings totaling $13,173.

<u>Skylights vs. shop lighting</u>
The intern evaluated potential electricity savings and increased illumination if sky lighting were implemented at CST. It was concluded that skylights would increase the average illumination of 412 lux to more than 485 lux during the day for most times of the year. The electricity savings associated with 150 skylights was limited to 61,070 kWh ($5,191) per year due to current LED lighting savings. This led to the project having a long payback of 11.3 years for skylights (not including installation) leading it to not be

recommended for CST.

Solar array for facility lighting

The intern was asked to research the benefits of an on-site solar array to be mounted on CST's roof. Three solutions were given for different array sizes with the largest being an industrial 258.23-kW system to supply enough power for all of CST's lighting. The yearly production was estimated to be 368,390 kWh equaling $30,610. The payback was estimated to be 8.4 years with the potential of being lowered after a consulting firm's report.

Compressed-air-leak audit

This year a compressed-air-leak audit was performed identifying 56 leaks throughout the plant totaling at least $8,672 per year in potential savings if fixed.

LED lighting for office

The intern evaluated potential savings of replacing current T8 fluorescent bulbs with LEDs in the offices. The intern met with two local electric companies to receive quotes for the job and estimated savings associated with the bulbs from the quotes. The 15-W LED bulbs would result in an annual savings of $2,466 per year with a simple payback of 2.7 years.

Electricity savings for shop fans (revisited)

Previous interns had evaluated fan usage within CST's plant and conducted analyses to estimate the electricity wasted each year due to unused fans left running. The intern calculated that 7287 kWh could be avoided, equating to $622 per year, if outlet timers were installed. Ultimately these outlet timers would be difficult to manage on such a large scale and this project was not recommended for CST.

Summary of 2019 P2 intern recommendations for CST STORAGE

Project	Annual estimated environmental impact	Annual Estimated Cost Savings	Status
New Pre-Treatment System audit	43 $MTCO_2e$ 703,449 ft^3 natural gas 667,656-gal water	$13,173	Implemented
Solar Array for Facility Lighting	388 $MTCO_2e$ 368,390 kWh	$30,610	Recommended
Compressed Air-Leak audit	113 $MTCO_2e$ 107,366 kWh	$8,672	Recommended
LED Lighting for Office	30 $MTCO_2e$ 28,880 kWh	$2,466	Recommended
Total[1]	504,636 kWh 703,449 ft^3 natural gas 667,656-gal water	$54,921	
GHG reductions[1,2]	574 metric tons CO_2e		

[1]Does not include projects "not recommended" or with "more research needed".
[2]EPA P2 GHG Calculator with Cost, Apr. 7, 2016