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 MT CO2e 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 pretreatment 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.

Projects Reviewed for P2 potential
New pretreatment system audit
CST recently installed new water heaters as part of the pretreatment 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 ft³, respectively, with cost savings totaling $13,173.

Skylights vs. shop lighting
The intern evaluated potential electricity savings and increased illumination if skylights 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

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.
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.

Summary of 2019 P2 intern recommendations for CST STORAGE

<table>
<thead>
<tr>
<th>Project</th>
<th>Annual estimated environmental impact</th>
<th>Annual Estimated Cost Savings</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Pre-Treatment System audit</td>
<td>43 MTCO$_2$e 703,449 ft$^3$ natural gas 667,656-gal water</td>
<td>$13,173</td>
<td>Implemented</td>
</tr>
<tr>
<td>Solar Array for Facility Lighting</td>
<td>388 MTCO$_2$e 368,390 kWh</td>
<td>$30,610</td>
<td>Recommended</td>
</tr>
<tr>
<td>Compressed Air-Leak audit</td>
<td>113 MTCO$_2$e 107,366 kWh</td>
<td>$8,672</td>
<td>Recommended</td>
</tr>
<tr>
<td>LED Lighting for Office</td>
<td>30 MTCO$_2$e 28,880 kWh</td>
<td>$2,466</td>
<td>Recommended</td>
</tr>
<tr>
<td>Total$^1$</td>
<td>504,636 kWh 703,449 ft$^3$ natural gas 667,656-gal water</td>
<td>$54,921</td>
<td></td>
</tr>
<tr>
<td>GHG reductions$^{1,2}$</td>
<td>574 metric tons CO$_2$e</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^1$Does not include projects “not recommended” or with “more research needed”.

$^{2}$EPA P2 GHG Calculator with Cost, Apr. 7, 2016.