

2016 Case Study

Henke Manufacturing

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Major: Civil Engineering
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Leavenworth, Kansas



Company background

Henke Manufacturing, established in 1961 and a recognized industry leader, has long established history in the snow removal business. It is an industrial company that specializes in the manufacture of snowplows and other attachments. Henke currently has 88 employees.

Project background

One of the main goals the company had for its pollution prevention, or P2, intern was to find a way to reduce overall waste coming out of the paint booth. To get a better understanding of the paint process and overall flow of work at Henke, the intern observed the paint department several days throughout the summer. These observations showed a clear opportunity for improvement.

The intern also performed an evaluation of Henke's compressed-air system, using an ultrasonic leak detector to look for air leaks and other waste from its processes. He also contacted vendors to research solar power installation and power-factor correction. From conversations with various employees, the intern found that Henke has problems with its heating system during the winter. The intern investigated benefits of using radiant heaters to replace Henke's current system. Henke's second shift in building one consists mainly of welding technicians, yet lights for the entire shop floor are kept on for the whole shift. Seeing this, the intern investigated methods to reduce the amount of waste from lighting at Henke.

Incentives to change

Since 2010, Henke has made a strong push to ensure they are in compliance with all governmental environmental laws and regulations. Not only does the company want to make sure it currently meets all requirements, but also wants to ensure it will stay in

compliance for the foreseeable future. Henke has found the more work it does to decrease waste from all areas of its processes, the easier it is to meet government regulations.

Henke also has a strong financial incentive to decrease waste as much as possible. It is the largest supplier of snowplows in the United States, and is constantly trying to narrow the price gap so it can continue to grow as a company. This means reducing waste wherever possible. One way Henke is trying to meet both its financial and environmental goals is by participating in the Kansas State University Pollution Prevention Intern Program.

Projects reviewed for P2 potential

The first P2 intern project was installation of a new, more efficient paint system. Henke currently uses a high-volume, low-pressure (HVLP) air-spray paint system. The intern performed measurements to determine the percent of paint waste from the HVLP system. He determined Henke currently loses 12.5 percent of the paint it uses due to its current paint-mixing method and from flushing out paint lines. This does not include paint sprayed into the air that doesn't make it onto the part. The intern recommended replacing the current system with an electronic proportioning system and electrostatic paint guns. Doing this would not only reduce paint waste by 8.3 percent, but the electrostatic paint guns will increase transfer efficiency of the current paint system by at least 10 percent. The project will reduce Henke's paint costs by \$81,833 annually and its VOC emissions by 1.4 tons.

The second project was a compressed-air audit. Henke uses compressed air to power tools and equipment, and its blast booth and paint booths, as well as other miscellaneous applications. The intern completed a compressed-air audit and found 47 leaks which, if fixed, will create savings of 116,499 kWh and

\$13,980 annually.

The third project examined Henke’s natural gas space-heater system. The system turned out to be undersized for its task because it only provides 26,780 of the 107,330 therms required to heat Henke’s two shop spaces. The intern looked into radiant heaters as an alternative. The radiant heating system would be a much larger system than Henke’s current system. Therefore, while it is more efficient, the system will consume 3,877,000 more cubic feet of natural gas annually and cost Henke \$26,169 more to run.

The fourth project was to reduce the amount of time Henke has lights on when they aren’t in use. The intern looked into installing light switches that could turn off various unused areas of Henke’s shops. For example, Henke only uses small sections of its welding and fabrication areas during the second shift, meaning all other lights in the shop can be turned off. The intern also recommended installing occupancy sensors in low-traffic areas. The project will provide 98,546 kWh and \$10,995 per year of savings.

The fifth project the intern looked into was replacing Henke’s T5 fluorescent bulbs with T5 LEDs. Henke had already been replacing its T8 and T12 fluorescent bulbs with LED lighting before the intern arrived.

However, it wasn’t replacing T5 bulbs because of too high a price to justify the purchase cost. The intern researched T5 replacements and found less expensive bulbs. The intern recommended Henke begin replacing their current T5 bulbs. The savings from this project will be 43,902 kWhs and \$5,268 annually.

The sixth project was a power-factor correction for two of Henke’s electrical meters. The meters had power factors of 83 percent and 85 percent. The intern determined that the savings from the correction would be \$1,205 each year.

The seventh project was providing Henke with a solar evaluation for a 127 kW, 455-panel system, which would provide 60 percent of the power for one of Henke’s buildings, and provide Henke an average annual savings of 164,703 kWh and \$38,684 over its 25-year life span.

The eighth project was to begin recycling the water in Henke’s plasma table. Henke was told this year that, from now on, it would have to have the water in the table taken away as special waste when it was drained for cleaning. The intern suggested to instead save the water, and put it back in the table after cleaning. This project saved 525 gallons and \$2,800 annually.

Summary of 2016 P2 intern recommendations for Henke Manufacturing

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Electrostatic paint guns and electronic proportioning system	1.4 tons VOC/year	\$81,333	Recommended
Compressed-air audit	116,499 kWh/year	\$13,980	In progress
Radiant heaters	-3,877,000 cubic feet natural gas	-\$26,169	Recommended
Lighting use reduction	88,981 kWh/year	\$10,678	Recommended
T5 replacement	43,902 kWh/year	\$5,268	Recommended
Power factor correction	N/A	\$1,205	Recommended
Solar power	164,703 kWh/year	\$38,684	Recommended
Plasma table	525 gallons/year	\$2,800	Implemented
Total savings *	525 gal water, 414,085 kWh, -3,877,000 CF NG, 1.4 tons VOCs	\$127,779	
GHG reductions *	193.2 metric tons CO₂e		

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