

2018 Case Study

Superior Essex

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Major: Mechanical Engineering
Technology (Masters)
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Company background

Superior Essex has been a leading designer and manufacturer of copper telecommunications cables since the 1980s. It is a world-renowned company and with 30 years of experience in manufacturing. The company has 102 product families of cable and manufactures 1,438 different products. It is located in Hoisington, Kans., employs 250 people. Its SIC code is 3351 and the NAICs code is 331422.

Project background

Superior Essex is committed to reducing energy usage and its environmental impact. The 210,000-square-foot manufacturing facility has an adjacent 12,650 square feet of office space, and a total covered plant area of 292,650 square feet. The company is working toward receiving a P2 award next year. The production operation is efficient in many aspects such as use of variable-frequency motors and implementation of a periodic maintenance plan.

The 2018 intern focused on energy-conservation projects and completed a compressed-air leak audit, a lighting replacement study, and an energy-saving fan study for the facility.

Incentives to change

Superior Essex is the leading producer of winding wire, and is the first cable manufacturer to achieve the Living Product Challenge and zero waste to landfill. Zero waste to the landfill was achieved in 2015 and the Living Product Challenge was achieved in 2017. The company has a commitment toward reduction of electricity consumption in the facility, and earning a higher-level certification of the Living Product Challenge. Over the last 12 years, it has reduced its total electrical energy use by 50% and wants to continue to reduce its natural resource consumption. In 2018, Superior Essex

partnered with the Kansas State University Pollution Prevention Institute to host a P2 intern for the first time.

Projects reviewed for P2 potential

Compressed-air leak audit

The intern conducted an air-leak audit using the Ultra probe 10000MPH around the shop floor. The intern identified 72 leaks, marking each with a tag indicating its decibel value. The decibel value of the air leaks ranged between 31 dB to 105 dB. Most of the leaks occurred in the pneumatic actuator control valve and a pneumatic connector. The decibel values were processed using UE systems software and a report was generated. The report estimated that 298,733 kWh were wasted annually due to the air leaks. By completely repairing the air leaks exposed in the audit, there would be an estimated annual savings of \$28,768 and 298,733 kWh of energy.

Upgrading fans

The shop floor is climate-controlled. There are 105 industrial fans with a two-speed option, having RPMs in the range of 800 to 1,075. There are two 12-hour shifts and most fans operate 24 hours per day, which increases energy usage. The fans are located in the areas the operators work most of the time, though many fans are left running in absence of operators in that location. Fan wattage varies between 288 W to 586.5 W. The intern recommended implementing more efficient fans in combination with training shop floor operators in the importance of saving energy. A Zoo fan operates at 55 W. By replacing current fans with Zoo fans, annual savings for Superior Essex will be \$16,545 and 171,806 kWh.

The lighting project involved replacing T8s and T5s fluorescent bulbs with LED lighting. The intern counted 1,534 T8 lamps, rated at 25 watts in use in

the plant area and counted 3,900 T5 lamps, rated at 44 watts, in the office areas. The calculated electrical consumption per day for the T8 lamps is 870 kWh. The calculated electrical consumption per day for the T5 lamps is 8,191 kWh. LEDs are more efficient than fluorescent lamps as they last longer and produce comparatively less heat. Another important fact is that LEDs contain no mercury. An LED fixture eliminates use of a ballast and reduces maintenance costs. Electricity consumption for Superior Essex could be reduced by nearly 49% percent for an annual savings of \$94,000, if it were to switch to LEDs.

Other projects

The intern began a water conservation project in the front office restroom. Thirty-eight staff work in the front office, 26 males and 12 females. An estimated excess usage of 44,384 gallons of water in the restroom could be saved by implementing faucet aerators flowing at 0.5 gpm and toilets

flushing at 1.28 gpm. Full implementation costs and payback period for the project were not calculated.

The intern also began a water conservation project in which the intern looked into water usage on the insulation process line. The recycled hot and chilled water are utilized on this line. Hot water is maintained at 150°F and chilled water at 60°F. Depending on the product, hot or chilled water is used during the process. During the down period in the process line, the waterline is not turned off. This increases the cost of heating, cooling, and the water-recycling system. . The electricity used to heat and chill the water in the insulation process line can be reduced by turning the water valves off during the down periods. The 490 gallons per hour per line of hot or chilled water is used in the insulation process, and the heating cost per gallon is \$2.00. The internship ended before more research could be completed.

Summary of 2018 P2 intern recommendations for Superior Essex

Project Description	Annual Estimated Environmental Impact	Annual Estimated Cost Savings	Status
Compressed air leak audit	299,000 kWh	\$28,768	In progress
Upgrading fans	172,000 kWh	\$16,545	Recommended
LED retrofit	977,000 kWh	\$94,129	Recommended
Office restroom water conservation	169,000 gal	\$3,046	More research needed
Other	30,000 kWh	\$2,883	More research needed
Total¹	1,448,000 kWh	\$139,442	
GHG reductions^{1,2}	1,416 metric tons CO₂e		

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

²EPA P2 GHG Calculator with Cost, Apr. 7, 2016