

Project Overview

Intern: Zach Luedtke
Major: Mechanical Engineering
School: University of Nebraska-Lincoln



Project Background

The Nebraska Industrial Assessment Center (NIAC) is a program funded by the U.S. Department of Energy (DOE). There are a total of 28 other Universities participating in the IAC program. The IACs supply small to medium sized manufacturers with free energy audits. After the audits, IAC programs deliver reports offering recommendations leading to energy and cost savings.

Project Description

The NIAC performed eight assessments during the summer of 2017. Zach Luedtke took part in five of these assessments. The assessments were for a variety of manufacturing facilities including plastic injection molding, food processing, wastewater treatment, and animal feed production facilities. Luedtke also served as lead student at a scientific instrumentation manufacturer. All facilities had some common points of focus such as lighting, compressed air, motors, and insulation which were developed into assessment recommendations. Many facilities provided an opportunity to look at heat recovery using shell and tube heat exchangers leading to a special project detailed in Chapter 4: Heat Exchangers.

Pollution Prevention Benefits

A summary of the benefits associated with recommendations Luedtke worked on are shown in Table 1.

Table 1. Summary of Assessment Recommendations

Assessment Recommendation	Annual Savings		Capital Investment (\$)	Simple Payback (Years)	Greenhouse Gas Reduction (MTCO ₂ e/year)
	Resource (Unit/year)	Dollars (\$/year)			
Utilize Larger Hand Towels	1,140 lbs	\$3,700	\$300	0.1	0.63
Recover Heat from Smokestacks	14,400 MMBtu	\$62,200	\$63,300	1.0	7.66
Add Insulation to Steam Pipes	616 MMBtu	\$2,660	\$840	0.3	0.33
Upgrade Facility Lighting	31,648 kWh 50.436 kW	\$1,640	\$9,825	6.0	34.37
Install Occupancy Sensors	27,048 kWh	\$920	\$980	1.1	29.37
Replace Standard V-Belts with Cogged V-Belts	6,480 kWh 0.9 kW	\$420	\$106	0.3	7.04
Total	1,140 lbs 15,016 MMBtu 65,176 kWh 51.336 kW	\$71,540	\$75,351	-	79.40 MTCO₂e/year