Project Overview

Intern: Brad Shaner
Major: Mechanical Engineering
School: University of Nebraska-Lincoln

In the summer of 2017 the P3 program partnered with the Nebraska Industrial Assessment Center (NIAC) to assess 8 Nebraska businesses. The NIAC is a part of an environmental sustainability initiative funded through the U.S. Department of Energy. The program performs free, one-day energy assessments for local manufacturing plants, develops energy saving recommendations for the facilities, and produces reports that detail these finds which are given to the manufacturers. Over the course of the summer, Brad Shaner participated in four assessments including a medical device manufacturer, a construction lumber manufacturer, and a scientific instrumentation manufacturer. Shaner was also the lead analyst on one assessment for an animal feed producer.

Assessment recommendations included optimizing compressed air systems, insulating pipes, and improving product line efficiency. The sum of energy and cost savings from assessment recommendations of the four assessments described in the report can be found in *Table 1.* Shaner's contributions to the overall reports totaled electrical usage savings of 447,000 kWh/year, for a cost savings of $12,400/year.

In addition to the assessment recommendations, Shaner developed a steam system assessment guide for use during one-day assessments. The guide identifies common recommendations, lists common equipment that should be checked, and lists data that should be collected during the assessment. Also included in the guide are three calculators designed to quickly obtain the combustion efficiency of a boiler and savings that could be realized by increasing efficiency. This tool will be used by future NIAC students to prepare them to assess a steam system and to improve the service provided to clients during the assessment.

Table 1: *Recommendations Summary*

Assessment Recommendation (AR)	**Annual Savings**		**Simple Payback (years)**
	Resource (Unit/year)	**Dollars ($/year)**	
Leak Detection Program	403,000 kWh/year	$55,200/year	1.9 years
Removing Open Blowing Lines	44,000 kWh/year	$1,300/year	1.0 years
Insulating Exhaust Ducts	Indeterminate	Indeterminate	Indeterminate
Overall Animal Feed Report	6,500 kWh/year	$420/year	4.8 years
Total Sum*	447,000 kWh/year	$12,400/year	2.0 years

*The overall payback was calculated based on the total sum of all capital investments divided by the total sum of dollar savings from all the recommendations