

## Project Overview

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**Major:** Mechanical Engineering

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### Summer Activities

As part of the Nebraska Industrial Assessment Center (NIAC) team, I participated in the assessments of four different manufacturers. Some of the facilities were located in the city of Lincoln, NE, while some of them were in the other cities of Nebraska. The assessed facilities were the manufacturer of a variety of products including plastic and metal plastic parts and mesh, nuts and seeds, red meats products and steel automotive parts.

### Recommendations Description

As part of these assessments, examples of the recommendations that were prepared include adjusting the temperature of closed-loop cooling water system used to manage temperatures in plastic injection molders, installing a secondary air receiver tank to increase buffer capacity of the system and reducing the likelihood of the second stand-by compressor kicking in, and upgrading a steam shrink tunnel at a meatpacking facility to an electric one which eliminated the need for steam and water usage, thus reducing water, sewage, and natural gas costs.

### Results

The results of the recommendations discussed above, and their pollution prevention benefits are summarized below in Table 1.

**Table 1: Pollution Prevention Benefits and Results**

Recommendation	Annual Cost Savings (\$/year)	Implementation Cost (\$)	Payback Period (years)	Annual Utility Savings	GHG Reduction (MTCO <sub>2</sub> e/year)
Secondary Air Tank	\$3,390	\$4,160	1.2	300 kW	-
Water Chiller Optimization	\$6,418	\$120	>0.1	259,400 kWh	250.3
LED Facility Lighting	\$6,573	\$26,965	4.1	80,379 kWh 251 kW	77
Electric Shrink Tunnel	\$10,229	\$70,000	6.8	1,350,000 gal 15,312 therm	89.4
Cogged V-Belts	\$573	\$510	0.9	7,940 kWh 10.9 kW	7.6
Reduce Compressed Air Leaks	\$2,200	\$5,800	2.6	112,500 kWh	80
<b>Total</b>	<b>\$29,383</b>	<b>\$107,555</b>	<b>6.3</b>	<b>460,219 kWh 561.9 kW 15,312 therm 1,350,000 gal</b>	<b>504.3</b>