

Chapter 1 – Project Overview



Personal Information

Intern: Tom Fulton

Major: Mechanical Engineering

Background

Working as an undergraduate student analyst of the Nebraska Industrial Assessment Center, the intern conducted energy and waste assessments for four manufacturers. These include Endicott Brick in Fairbury, NE; Masaba, Inc. in Vermillion, SD; South Dakota Industries (SDI) in Alexandria, SD; and Westin Packaged Meats in Fairbury, NE. Endicott Brick specializes in manufacturing clay brick material, Masaba, Inc. manufactures mining and conveyor-integrated equipment, and SDI fabricates metals for use in the swine industry. The intern led the NIAC team at the assessment of Westin Packaged Meats, who leads the foodservice industry in manufacturing and packaging bacon bits and bacon-flavored toppings.

Project Description

Throughout these assessments, the intern made five individual assessment recommendations (ARs). Including leading the assessment of Westin Packaged Meats, the intern worked on nine ARs. The five individual recommendations include:

- Upgrade Facility Lighting (3 assessments)
 - o This describes replacing existing fluorescent, halogen, and incandescent bulbs and fixtures with light emitting diode (LED) equivalents. LED technology does not require varying ballast current regulation, allowing bulbs to consume their rated wattages and eliminating power loss from ballast consumption. In most cases, LED lighting reduces electricity use and electrical demand. With longer lifespan, LED lighting also reduces the cost of maintenance.
- Install Occupancy Sensors (1 assessment)
 - o Installing occupancy sensors on lighting fixtures allows manufacturers to reduce the time unused lighting consumes electricity within their facility without needing to shut off large sections of lights at a given time. Occupancy sensors are extremely useful in areas of a facility that experience light use during production hours.
- Install Flow Restrictors (1 assessment)
 - o Purchasing and installing nozzles on hot water cleaning lines reduces energy consumption in two areas: heat generation and municipal water use. Without altering the operating pressure of the cleaning line, nozzle flow restrictors prevents manufacturers from wasting water during cleaning processes. Using less hot water allows facilities to use less natural gas to generate heat for their process.

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

Pollution Prevention Benefits

The benefits of these assessment recommendations are detailed in Table C1.

Table C1: Summary of Impact, Summer 2019

Facility	Assessment Recommendation	Annual Cost Savings	Annual Energy Savings		Cost of Implementation	Simple Payback Period (years)	Annual Greenhouse Gas Emission Reduced
Endicott Brick	Upgrade Facility Lighting	\$15,352 /year	169,028 kWh/year	33.9 kW/month	\$25,229	1.6	119.5 MTCO _{2e}
Masaba, Inc.	Upgrade Facility Lighting	\$36,555 /year	525,250 kWh/year	8.5 kW/month	\$34,820	1.0	371.3 MTCO _{2e}
South Dakota Industries	Upgrade Facility Lighting	\$4,862 /year	33,398 kWh/year		\$7,623	1.6	23.6 MTCO _{2e}
South Dakota Industries	Install Occupancy Sensors	\$674 /year	11,825 kWh/year		\$4,353	6.5	8.4 MTCO _{2e}
Westin Packaged Meats*	Install Capacitor Bank to Improve Facility Power Factor*	\$35,066 /year*	Unknown electrical demand reduction*		\$39,000*	1.1*	N/A*
Westin Packaged Meats*	Implement Steam Trap Maintenance*	\$13,023 /year*	15,697 MMBtu/year*		\$110*	0.0*	832.1 MTCO _{2e} *
Westin Packaged Meats*	Upgrade Facility Lighting*	\$12,538 /year*	175,543 kWh/year*		\$7,282*	0.6*	124.1 MTCO _{2e} *
Westin Packaged Meats	Install Flow Restrictors	\$7,716 /year	2,730,000 gal/year	716 MMBtu/year	\$1,127	0.2	38.0 MTCO _{2e}
Westin Packaged Meats*	Repair Compressed Air Leaks*	\$4,921 /year*	126,284 kWh/year*		\$1,600*	0.3*	89.3 MTCO _{2e} *
AR Totals	Intern's total impact: 9 ARs*	\$130,707 /yr*	1,041,328 kWh/yr	508.8 kW/yr	\$121,144	0.9**	1,606.3 MTCO_{2e}
			16,413 MMBtu/yr	2,730,000 gal/yr			
	Intern's individual impact: 5 ARs	\$65,159 /yr	739,501 kWh/yr	508.8 kW/yr	\$73,152	1.1**	560.8 MTCO_{2e}
			16,413 MMBtu/yr	2,730,000 gal/yr			

*Includes recommendations by another student as part of lead assessment report

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