

# GOLDEN CRISP PREMIUM FOODS, INC.

SIoux CENTER



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## COMPANY BACKGROUND

Golden Crisp Premium Foods, Inc. in Sioux Center, Iowa, is a branch of Patrick Cudahy, and is a producer of pre-cooked bacon. The plant in Sioux Center is about 107,000 square feet and employs approximately 420 workers. The plant receives shipments of frozen pig bellies, and then flavors, slices, heats and packages the bacon to be ready for consumption. Various slicers and slicer settings allow for the production of many different shapes and sizes of bacon. On average, the company produces over 60,000 pounds of bacon every day.

## PROJECT BACKGROUND

Golden Crisp Foods uses five industrial microwave ovens to heat the bacon. Analysis showed that the ovens account for approximately 65 percent of the plant's utility bill. Other large consumers include the refrigeration system, lighting, and large water heaters needed for sanitation. The company teamed with the Pollution Prevention intern program to identify opportunities to improve the efficiency of its processing systems and reduce utility costs.

## INCENTIVES TO CHANGE

In 2011, Golden Crisp Premium Foods, Inc. received an Environmental Recognition Award from the American Meat Institute. The company continues to seek opportunities to employ pollution prevention strategies and improve environmental performance. One of their environmental priorities is to decrease overall energy consumption at the plant by 10 percent by the end of 2013. The outcome of the 2012 Pollution Prevention intern project could have a substantial impact in achieving this goal.

## RESULTS

**Microwave Oven Operational Consistency:** When seeking energy reduction opportunities in the bacon cooking process, many variables must be taken into consideration. Variables include the quality of the pig bellies, adjustments for microwave transmitters and the amount of space between each slice of product on the conveyor belt. For this reason, quantifying potential changes to increase energy efficiency can be a challenge. More research is recommended, which could include an in-depth assessment to achieve a more consistent oven operating plan and a review of opportunities to improve the operational accuracy of the vision system on each production line.



## CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS

Total for all sectors					
CO <sub>2</sub>	SO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CFC	PM <sub>10</sub>
843.15	4.34	27.45	0.04	9.86	0.10



**Reduce Heat Load in RTE Rooms:** Hot bacon and hot conveyor belts roll directly out of the ovens and into the Ready-To-Eat (RTE) rooms in the plant, generating an increased heat load for these areas. Addressing this issue could reduce refrigeration energy usage as well as costs. One option would be constructing a wall in the RTE rooms to create an additional unrefrigerated room where the bacon could first be cooled with outside ambient air. Not only could this allow the bacon time to cool before it enters the refrigerated rooms; it could also decrease the mass of bacon and conveyor belts that occupy the RTE rooms at one time. Implementing this change could be cost-prohibitive, so researching other options is recommended.

**Advance Lighting Retrofit:** Most of the lights on the plant floor are sodium halide lights, which lose their efficiency after a short period of time. In addition, the heat generated by these bulbs can be significant enough to affect the amount of refrigeration required to cool the plant's freezers and coolers. Golden Crisp has already begun a LED retrofit to reduce energy usage and eliminate any additional head load generated by the facility's lighting. Although the initial investment is costly, doing a full scale change-out as opposed to a phased-in approach can save additional money and energy in the long run.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
MICROWAVE OVEN OPERATIONAL CONSISTENCY	\$46,000	663,000 KWH	RECOMMENDED
REDUCE HEAT LOAD IN RTE ROOMS	\$185,000	2,643,000 KWH	MORE RESEARCH NEEDED
ADVANCE LIGHTING RETROFIT	\$73,000	843,000 KWH	RECOMMENDED