KRAFT FOODS GLOBAL, INC.

COMPANY BACKGROUND

Kraft Foods Inc. is the largest branded food and beverage company headquartered in the United States. Kraft's 2007 net revenue was $37 billion with nine brands having revenue over $1 billion including Oscar Mayer, Philadelphia cream cheese, Maxwell House coffees, Nabisco cookies and crackers, and Oreo cookies. The company employs more than 103,000 people in 180 manufacturing and processing facilities worldwide. The facility in Mason City, Iowa employs approximately 250 people and produces ready-to-eat Jell-O desserts and pudding cups.

MASON CITY

TIM HILL
INDUSTRIAL ENGINEERING
IOWA STATE UNIVERSITY

PROJECT BACKGROUND

Kraft has demonstrated a strong commitment to reducing its environmental footprint through the implementation of many previous pollution prevention projects. Kraft utilized three Pollution Prevention Program interns in the past and all have realized huge savings both environmentally and financially. This year, their goals focused on reducing water consumption, energy use, wastewater and scrap product.

INCENTIVES TO CHANGE

As the price of natural gas increases, it becomes more and more expensive to operate the boilers with the limitations of the current system. With the expectation of significant increases in the price of natural gas over the next five years, it is important to increase the efficiency of the boilers as much as possible to minimize the amount of wasted energy.

It is also becoming increasingly important to look for alternatives in the disposal of sludge. Over the last few years the acceptance of land application of waste materials has diminished. Kraft uses chemicals known as GRAS (Generally Regarded as Safe) so there is no chemical risk to the environment through land application, but finding a higher end use for this material is very attractive.

RESULTS

Steam Trap Program: There are nearly 1000 steam traps in Kraft's Mason City facility. Sample surveys conducted by Kraft employees in the past have shown a 30 percent failure rate, but the surveys were never finished. A database of steam traps has now been created to aid in future surveys. A steam trap maintenance program conducted by an outside source could quickly produce savings in energy through reduction in steam losses.

Boiler Waste Heat Economizers: The plant has three boilers with maximum steam capacities of 25,000 pph each. Two boilers are online at any given time meeting the average steam demand of 25,000 pph. These boilers produce an average stack temperature of 400°F, and current feed water is pumped into the boiler at a temperature of 210°F. If boiler economizers were installed on all three stacks, feed water temperature could be increased to nearly 260°F by using the waste heat leaving the stacks. Using the waste heat creates an opportunity to save 130,000 therms per year with an annual cost savings of $135,000. Economizers provide the opportunity to lower the fuel requirements of a boiler by five to ten percent, and would reduce the combustion exhaust released to the atmosphere.

An indirect contact condensing economizer is very similar to a feed water economizer. The main difference is that the water being heated in the economizer would be used in process. If Kraft were able to heat process water with waste heat leaving the feed water economizer, the demand for steam in the heat exchangers would be reduced. This is a more feasible alternative to a direct fire water heater because it eliminates the fear of water contamination. If a condensing economizer were installed, it could raise the efficiency of the boiler up to ten percent and save Kraft 200,000 therms per year with an annual cost savings of $190,000.

Sludge Dewatering: Currently Kraft land applies 20,000 tons of sludge from wastewater treatment annually. A sludge dewatering system would reduce the volume by 60 percent. Contact has been made with an area hog farmer to use the cake as hog feed if the dried cake is determined to have nutritional value. The farmer would take the cake at no cost to Kraft and this would divert all sludge from land application. Sludge in the current wet state serves no benefit to the farmer due to the volume and consistency of the wet sludge.

Air Pollutants Diverted in Tons

	Total for all sectors
SO2	26.039
CO	3.855
NOX	12.645
VOC	3.359
PM	0.664

Green House Gases Diverted in Tons (CO_2 Equivalent)

	Total for all sectors
CO2	4989.511
CH4	844.788
N2O	2.143
CFCS	60.856

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
STEAM TRAP PROGRAM	$213,000	225,000 THERMS	IN PROGRESS
BOILER FEED WATER ECONOMIZER	$135,000	130,000 THERMS	IN PROGRESS
INDIRECT CONTACT CONDENSING ECONOMIZER	$190,000	200,000 THERMS	RECOMMENDED
SLUDGE DEWATERING	$155,000	20,000 TONS OF SOLID WASTE DIVERTED FROM LAND APPLICATION	RECOMMENDED