BENEFITS:

- *Identified potential annual cost savings of $330,830*
- *Recommendations saved approximately $151,458 of resource costs*
- *72% of recommendations implemented*

Energy *focus*

ADDRESSING THE NEEDS OF INDIVIDUAL PLANTS & PLANTING THE SEEDS FOR A SECURE FUTURE.

"We found the … study to be thorough, helpful & require little of our people's time. In addition, the cost reduction suggestions were affordable & significant."

- Mark Bitz

Helping you achieve your energy goals

Summary

Through the Department of Energy's *Industrial Assessment Center* (IAC) located at Syracuse University, a poultry processing manufacturer was able to realize significant savings from reductions in energy & productivity costs. Through recommended changes to the compressed air system, administrative costs, building upgrades, boiler improvements, machine changes, & lighting retrofits, the company can potentially save approximately $330,830 annually.

Assessment Overview

A team of students & faculty from the IAC at Syracuse University performed an industrial assessment at Plainville Farms in Plainville, New York, in the spring of 2003. The assessment was led by Center Director Frederick J. Carranti, P.E., a faculty member in the Department of Mechanical & Aerospace Engineering. The IAC team employed a comprehensive assessment methodology that considered energy, waste, & process-related improvements. The team examined all large energy-consuming equipment & systems for potential savings. They compiled a waste inventory & investigated the potential for waste reduction or improved disposal/recycling methods. The team also examined manufacturing processes for potential improvements, & emerging technologies were assessed for potential contributions to efficiency improvements.

Energy Conservation

The Syracuse IAC was able to identify a potential annual savings of $330,830. The company implemented approximately 73% of recommendations made by the IAC & achieved an annual resource savings of approximately $151,458.

Applications:

The Syracuse University Industrial Assessment team discovered opportunities to decrease energy usage & thereby increase capacity, improve product quality, & enhance corporate competitiveness. The IAC team conducted a comprehensive assessment covering energy, waste & process-related improvements. The team's goal was to identify significant opportunities for cost savings, quality improvements, & productivity enhancement.

Company Background

Plainville Farms specializes in the production of tasty & healthy food products such as deli meats, fresh meats & other such products. The company was founded in 1835 & has always been a family owned business, currently operated by Mark Bitz.

The farm currently processes over 500,000 turkeys annually & is the largest turkey grower in the Northeast. Presently the farm consists of a total of 1,500 acres of which 20 acres are occupied by buildings to raise turkeys. The company workforce consists of 100 employees & is housed in a facility of approximately 52,000 ft^2. For more information please visit www.plainvillefarms.com

Overview of Recommended Actions
The table below summarizes specific recommendations identified during the assessment. These projections of savings & capital costs identified during the assessment have been validated through rigorous engineering analyses.
There were fourteen separate recommendations resulting from the energy assessment & they are summarized.

Getting the most from our research analysis

"We definitely would recommend their services to other businesses."
- Mark Bitz

Recommended Action	Annual Resource Savings	Annual Cost Savings ($)	Project Cost ($)	Simple Payback Period
Install a Wind Generator to Generate Processing Plant Electricity	*7,155 $^{MMBtu}/_{yr}$*	*$141,258*	*$1,171,875*	*8.3 years*
Install Insulated Barn Curtain	*146,839 $^{MMBtu}/_{yr}$*	*$115,419*	*$348,540*	*3 years*
Install a Centralized Refrigeration System	*1,125 Man Hours*	*$30,000*	*$76,517*	*2.5 years*
Replace Incandescent Lights with Fluorescents in Barns	*786 $^{MMBtu}/_{yr}$*	*$16,118*	*$55,580*	*3.1 years*
Use Cold Water for Day Cleaning	*1,697 $^{MMBtu}/_{yr}$*	*$8,721*	*None*	*Immediate*
Install Wind Generators to Operate Well Pumps	*127 $^{MMBtu}/_{yr}$*	*$7,901*	*$10,000*	*1.3 years*
Use Outside Air for Vat Blowers	*217 $^{MMBtu}/_{yr}$*	*$6,861*	*$270*	*2 weeks*
Adjust Boiler Air - Fuel Ratio	*678 $^{MMBtu}/_{yr}$*	*$3,485*	*None*	*2.4 months*
Return Condensate to Boiler	*252 $^{MMBtu}/_{yr}$*	*$1,292*	*$955*	*9 months*
Insulate the Cut & Bone Room Ceiling	*30 $^{MMBtu}/_{yr}$*	*$843*	*$1,744*	*2.1 years*
Replace Incandescent Lights with Fluorescent in Warehouse & Refrigerator	*26 $^{MMBtu}/_{yr}$*	*$722*	*$607*	*10 months*
Shutdown Freezer Floor Blowers	*21 $^{MMBtu}/_{yr}$*	*$550*	*None*	*Immediate*
Repair Compressed Air Leaks	*23 $^{MMBtu}/_{yr}$*	*$462*	*$29*	*1 month*
Utilize Outside Air for Compressor	*6 $^{MMBtu}/_{yr}$*	*$198*	*$150*	*9 months*
Totals	*1,125 Man Hours 157,857 $^{MMBtu}/_{yr}$*	*$333,830*	*$1,666,267*	

Renewable Energy
In recent years renewable energy's have become a more feasible idea, specifically wind generation. Major improvements in cost, operation, maintenance & performance have made wind farms more economically attractive for manufacturing facilities. Wind is a clean, renewable, abundant source of energy that is rapidly becoming popular. Studies have shown wind energy to have the lowest cost per kWh. The recommendation of electrical generation through the use of wind energy was based on the company's utility rates, company location, & local average wind speed.
The IAC's engineering analysis confirmed that the idea was viable but due to the current commodity rates & other economics, the progress of the project was hindered.
However, because of the recommendation the company has recently begun to purchase green power through the local utility.

Boiler
Due to the nature of the poultry business, high volumes of hot water & steam are needed to be produced by the company's boiler for the manufacturing process.
Two recommendations were made by IAC personnel to improve the overall efficiency of the system.
The first recommendation was to adjust the fuel-to-air ratio of the boiler. By operating the boiler at the optimal amount of excess air, it will minimize heat loss up the stack & improve combustion efficiency. Combustion efficiency is a measure of how effectively the energy content of a fuel is transferred into usable heat.
The second recommendation suggests a return of condensate to the boiler. By returning condensate to the boiler the company will realize savings in various areas. These areas include less make up water requirement, fuel savings & water treatment costs.

Pollution Prevention
Reductions in air pollution are projected due to the proposed energy efficiency opportunities. In general the electric energy savings will decrease carbon dioxide (CO_2), carbon (C), sulfur dioxide (SO_2), & oxides of nitrogen (NO_x) emissions at the utility's power generating station. Natural gas savings will primarily decrease CO_2 emissions at the plant.

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