



PROJECT RESULTS

- \$87,000 in annual energy cost savings
- 671,000 kWh in annual electrical energy use savings
- 19,000 therms in annual natural gas use savings
- \$62,316 in program incentives
- Simple payback of 10.2 months

When describing their newly expanded facility, plant manager, Paul Gillum said, “The expansion project has been not only trouble free, but the energy savings makes it one of the most successful endeavors Busseto Foods Inc. has ever experienced.”



Pacific Gas and Electric Company®

SALAMI PLANT SAVES ENERGY WITH NEW PROCESSING FACILITY

Busseto Foods decided to make its new expanded meat processing facility as energy efficient as possible even before construction began in Fresno, California. Due to growing demand for Busseto Foods’ existing products and the addition of new lines to the company’s product mix, Busseto Foods’ managers estimated the need to increase plant capacity by 50 percent, requiring an additional 12,200 square feet of conditioned area and more refrigeration and process heating capacity.

Busseto Foods turned to Pacific Gas and Electric Company (PG&E) and a statewide California utility-sponsored energy efficiency program, Savings By Design (SBD), for help in designing an efficient refrigeration and steam system and calculating their energy savings potential. The resulting energy efficient facility has allowed Busseto Foods to increase production, while saving 671,000 kWh, 19,000 therms and \$87,000 in annual energy costs.

BUSSETO FOODS

Founded in 1981, Busseto Foods produces Italian style, gourmet specialty meats such as salami, prosciutto, and other dry cured meats. The company’s products are distributed throughout the United States, and are exported to Japan and Mexico. Busseto Foods has experienced strong growth in the last several years due to rising product demand. Employment has grown over the years, from 15 employees in 1991, to 35 in 2001, rising to nearly 50 employees today. In anticipation of greater production rates, the production area was expanded in 2001. In 2004, a new compressor room was built and plans were made to add two new tempering rooms, three drip/dry rooms and an unloading dock.

OPTIMIZING THE DESIGN

During the project assessment, PG&E representatives found that the new plant’s anticipated load could be satisfied without a correspondingly large increase in steam and refrigeration system energy consumption. To accomplish this, the analysis identified the most efficient type of refrigeration equipment and boilers that would adequately serve the new plant. Program representatives approved the design of two evaporative condensers with floating head pressure



Many food processing plants are heavily dependent on refrigeration and steam systems to ensure the freshness, quality and safety of the foods they produce. If a food processing plant is being expanded or upgraded, ensuring the efficiency of its steam, process cooling and refrigeration systems can lead to significant energy savings without compromising production.

control technology using variable-setpoint control strategy and variable speed control for the fans. The condenser fan motors were energy efficient motors, rated at 92.4 percent efficiency. With a specific efficiency of 358 BTUH/Watt, these condensers were 8.5 percent more efficient than standard condensers.

For the steam system, program representatives found that installing two, smaller pulse type water boilers to provide hot water would be more efficient than one conventional atmospheric boiler of similar capacity. This is because the efficiency of the smaller, pulse type boilers is higher at mid to low-firing rates. Staging two pulse type boilers in a lead-lag configuration would enable them to operate close to their maximum rated efficiencies of between 84% and 87.5%, reducing natural gas consumption.

PROJECT SUCCESSES AND LESSONS

Busseto Foods achieved its goals of expanding production while using less energy by installing higher efficiency steam and refrigeration systems in their Fresno plant. With the additional drip/dry and tempering, the company is able to process 150,000 pounds of salami, enabling Busseto Foods to meet its production and sales targets. Just as impressive, total annual energy savings from the new facility are approximately \$87,240, 19,000 therms and 671,000 kWh, which is consistent with the estimates calculated in the project assessment. These energy savings made it possible for Busseto Foods to earn a program incentive of \$62,316. With total costs of \$74,000 above the costs of less efficiently designed steam and refrigeration systems, the project achieved a simple payback of less than one year (10.2 months).

EFFICIENT EVAPORATOR CONDENSER CONFIGURATION

Refrigeration system efficiency can be optimized depending on the size and control strategy of the condenser. An oversized condenser can increase system efficiency by reducing the load on the compressor and the condenser fan because it allows for lower system saturated condensing temperature and pressure. Optimal condenser head pressure control can also save energy because evaporative head pressure is allowed to float down to a minimum pressure as the load decreases, instead of maintaining a fixed head pressure independent of system load. Also, with floating head pressure, changes in the ambient air temperature can reduce the condenser capacity requirements, reducing the load on the compressor, which can yield energy savings.

PG&E'S ENERGY MANAGEMENT SOLUTIONS can help you control your operating expenses through building energy efficiency and demand response capabilities into your new and existing facilities, and your long-range planning. Services include energy analyses of existing facilities, design assistance for planned projects, equipment rebates, project incentives, and education and training. For more information call PG&E's Business Customer Service Center at (800) 468-4743 or visit www.pge.com/business