

REDUCING DIRECT GHG EMISSIONS ON THE REFRIGERATION SYSTEM TO NEAR ZERO

\$1.5 Million from the California Energy Commission



INDUSTRY

FOOD & BEVERAGE

APPLICATION

FROZEN FOOD PRODUCTION & WAREHOUSING PLANT

SOLUTIONS

- // DETAILED HOURLY ENERGY MODELING
- // LOW GWP REFRIGERATION SYSTEM DESIGN AND OPTION ANALYSIS
- // AUTOMATED ENERGY EFFICIENCY MEASURES
- // ADVANCED REFRIGERATION CONTROL STRATEGIES

BENEFITS

- // REDUCED DIRECT GREENHOUSE GAS (GHG) EMISSIONS
- // REDUCED ONSITE ENERGY CONSUMPTION
- // IMPROVED SUSTAINABILITY AND RELIABILITY OF FUTURE OPERATING COSTS

THE CHALLENGE

A large frozen foods factory in California was originally designed to operate an industrial refrigeration system which utilized high Global Warming Potential (GWP) HFC refrigerants. This would result in significant GHG emissions and future operating cost concerns related to anticipated legislation banning the use of HFC refrigerants. This is the case for more than 100 similar facilities estimated to be operating in the state of California today. In recent years, however, more environmentally-friendly refrigerants have been developed, along with more efficient controls strategies, and advances in hardware technologies.

The challenge was to first identify and quantify the GHG emissions and the energy usage of the plant, and then to formulate a plan for the design and implementation of new, lower GWP refrigeration equipment that would utilize state-of-the-art energy efficient control strategies and installed with minimal interruption of plant operation.

THE SOLUTION

VaCom surveyed the facility, analyzed the existing refrigeration system, listened to and accounted for the customer's requirements and specifications, and built a detailed energy model of the plant. This model, along with the refrigeration experience of the VaCom's on-staff refrigeration and energy engineers, quantified the direct and indirect emission reductions for multiple low-GWP refrigeration system options. A detailed plan was formulated in conjunction with the customer and in accordance with their standards and specifications.

VaCom has an accomplished history of successfully working with California's electric utilities and California's food & beverage plant owners in identifying, implementing, and measuring & validating energy efficiency opportunities. It is due to these credentials that VaCom recognized the Food Production Investment Program within the California Energy Commission as an ideal opportunity to accomplish the goals of this customer.

THE RESULTS

VaCom was hired by the customer to develop a turnkey FPIP grant application on their behalf. Through sizing and modeling multiple refrigeration system design options, VaCom identified the most cost effective option that would result in the largest amount of GHG emission reduction. Additional energy efficient control strategies were proposed to further increase electrical energy and cost savings. The design and benefits of the new system were compiled in a detailed yet straightforward submission to the California Energy Commission.

The application was reviewed by the CEC, and accepted. 100% of the more than \$1.5M applied for grant was awarded by the California Energy Commission to the customer to aid in completing the project. A 94% reduction in GHG direct and indirect emissions is anticipated.

Upon completion of the project, the customer will have near zero direct GHG emissions from their refrigeration system, as well as a more sustainable and reliable operation going forward.