Simi Winery: Industrial Energy Assessment Uncovers Savings for Winery

Assessment Date

June 25, 2008

Recommendations

- Five recommendations to minimize energy use while maintaining production levels
- Recommendations estimated to reduce total energy usage by 8% per year
- Overall simple payback of 4 years for all recommendations combined
- 80% of recommended measures implemented

Plant Feedback

"I have found the audit a good resource to implement cost savings on many items you have listed. Thank you."
John Pritchard, Director of Operations
Simi Winery

Summary

The U.S. Department of Energy's Industrial Assessment Center at San Francisco State University provided technical assistance in the form of an industrial energy audit to Simi Winery in Healdsburg, CA in June 2008. The assessment team identified and recommended energy efficiency and conservation measures related to equipment maintenance, upgrades, and control strategy improvements. Major recommendations included reducing energy usage with floating head pressure control of the ammonia refrigeration compressors.

Company Background

Simi Winery, established in 1876 by Guiseppe and Pietro Simi, produces red and white wine. The main production processes at this facility include crushing, pressing, fermentation, cold stabilization, storage and shipping. For wineries, the crush period is the most energy intensive. Refrigeration loads comprise a majority of the Simi's energy usage, as reflected in the plant's annual energy expenditure of approximately $200,000 (for March 2007 through February 2008).

Assessment Approach

A team of faculty and students from San Francisco State University's Industrial Assessment Center performed an industrial assessment in June of 2008. The audit team was led by SFSU faculty member and Center Director Dr. Ahmad Ganji, and supported by student engineers Antonio Aliberti, Kevin Ng, and Mike Diep.

Energy Conservation Awareness

In addition to raising energy conservation awareness practices for management and employees at Simi Winery as a part of the overall industrial assessment, the audit team also noted the following best practices already being used:

- The facility had replaced existing lamps, ballasts and fixtures with high-efficiency lighting.
- Variable-frequency drives were utilized on several transfer pumps.
- The facility had installed an anaerobic wastewater treatment plant.

Measures recommended by the audit team that were subsequently implemented include the following:

Leak Mitigation

Routine maintenance of fittings and valves to minimize the nitrogen and carbon dioxide leaks represented an immediate cost savings opportunity. The audit team projects an energy cost savings of approximately $3,000 per year.

Interlock Water Circulation Pumps with Boilers

Interlocking switches were installed on the boilers to control the status of the water circulation pumps. The interlock switches turn the water circulation pumps on whenever the boilers are in use and turn them off when the boilers are turned off. Implementation of this measure saves approximately $1,000 per year in energy costs.

Variable-Speed Drives

Variable-speed drives (VSDs) were installed on the glycol circulation pump for the wine cellars. These reduce the energy use of motor-driven equipment, based upon process requirements. The change results in an annual energy savings of just under $2,000.

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Floating Head Pressure

The existing fixed head pressure refrigeration system was converted to a floating head pressure system. Allowing the head pressure to float reduces the power consumption of the ammonia refrigeration compressors, based upon ambient wet-bulb temperatures. This measure saves approximately $9,500 in energy costs per year.

Results

The audit team contacted the plant slightly over a year after delivery of the energy audit report. "We have saved 17% of our energy cost for the past year," reported John Pritchard, plant Director of Operations. In a recent communication with John, he stated "Your recommendations were excellent and we have been saving energy ever since."

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.