



Uncorking Energy Savings at a California Winery

The San Francisco State University Industrial Training and Assessment Center (ITAC-SFSU) provides student-led engineering services to local manufacturers to identify energy and water savings measures. Recently, ITAC-SFSU helped a California winery save 14% on its total energy bills.



Constellation Brands: Gonzales Winery
800 S. Alta St., Gonzales CA, 93926

Assessment At A Glance

- Eleven of twelve recommended energy saving measures were implemented by the facility resulting in \$134k of projected annual cost savings.
- A total implementation investment of \$150k leads to an average payback of 1.1 years.
- Electrical energy savings of 792,313 kWh/yr and natural gas savings of 1,410 MMBtu/yr result in an annual reduction of 441,487 lbs in GHG emissions.

Summary

Twelve potential energy savings measures representing cost savings of approximately \$173,620 per year were identified by the Industrial Training and Assessment Center of San Francisco State University (ITAC-SFSU) at the Constellation Brands Winery in Gonzales, California in 2018. After evaluation and planning of the recommended projects, the facility's management decided to implement eleven measures, realizing \$133,624 in cost savings with an estimated overall simple payback period of 1.1 years.

Company Background

Constellation Brands, Inc. is a leading international producer and marketer of beer, wine, and spirits with operations in the U.S., Mexico, New Zealand, and Italy. The company was founded in 1945 and trades as a NYSE: STZ (Class A) of the S&P 500. The Gonzales Winery has approximately 180 employees with a total square footage of approximately 552,000 ft² used for wine production.

Facility's Energy Conservation Awareness

The energy assessment team observed that the facility is aware of the importance of conservation and its impact on commercial competitiveness. At the time of the audit, they had already implemented limited energy efficiency measures, including on-site solar energy generation, LED lighting in offices and production areas, and variable frequency drives on some air compressors and refrigeration equipment.

Assessment Approach

The ITAC-SFSU team performed a comprehensive assessment of the facility's energy use in November 2018.

The team consisted of five engineering students led by Professor Ahmad Ganji, Director ITAC-SFSU. After an introductory meeting, the team toured the facility, conducted a detailed inspection of equipment and processes, performed selected measurements, and identified various potential opportunities for energy conservation. The team gathered the data necessary for quantification of the potential savings and provided estimations of the implementation costs.

Relevance of Findings

The ITAC-SFSU assessment team identified several opportunities for reducing energy use and enhancing commercial competitiveness. These included manufacturing aspects such as repairing air leaks, installing variable frequency drives on water and wastewater pumps, optimizing the usage of compressors and the refrigeration system, and installing high efficiency lighting. The results of this assessment have also served as a valuable guide to similar industrial plants for improving their production process.

Results

The audit team identified twelve energy and cost saving opportunities with a total annual potential savings estimated at approximately \$173,620. The facility's management decided to implement eleven of twelve recommended measures resulting in a reduction of annual electrical energy consumption of 792,313 kWh, corresponding to approximately 18% of total electrical energy used at that time. Additionally,

opportunities representing 1,410 MMBtu of natural gas savings, corresponding to approximately 9% of the facility's total natural gas consumption, were also implemented.

The total cost of implementation of all opportunities which were implemented, net of utility rebates, was estimated to be approximately \$149,980, resulting in an overall simple payback period of 1.1 years.

According to PG&E's Greenhouse Gas Emission Factors and the US Energy Information Administration, the identified electricity and natural gas savings opportunities would reduce CO₂ emissions by approximately 441,487 lbs per year, which is equivalent to burning approximately 22,758 gallons of gasoline.

Implemented Recommendations

Assessment Recommendations	Annual Resource Savings	Total Annual Savings	Capital Costs	Simple Payback
Turn Off the Stand-By Steam Boiler	1,410 MMBtu/yr (Natural Gas Savings)	\$10,552	-	Immediate
Repair Air Leaks	48,927 kWh/yr	\$5,167	\$1,440	Immediate
Install a VFD on the Chilled Water Circulation Pump	101,436 kWh/yr	\$15,254	\$4,129	0.3 years
Install a VFD on the Chilled Water Supply Pump and Open Control Valve	83,045 kWh/yr	\$12,489	\$4,651	0.4 years
Reduce Air Compressor Discharge Setpoint to 100 psi	39,685 kWh/yr	\$5,888	\$3,120	0.5 years
Replace Standard V-Belts with Cogged-Type Belts	1,921 kWh/yr	\$292	\$163	0.6 years
Install a VFD on Effluent Pumps in the Wastewater Area	191,549 kWh/yr	\$36,088	\$25,965	0.7 years
Set Back the Temperature in the Offices during Unoccupied Hours	27,700 kWh/yr	\$2,925	\$3,138	1.1 years
Interlock the Dryer with the Operation of the Air Compressor	11,172 kWh/yr	\$1,765	\$2,729	1.5 years
Install a VFD on the Ammonia Evaporative Condenser Fan Motors	57,871 kWh/yr	\$6,111	\$11,016	1.8 years
Install High Efficiency Lighting and Lighting Controls	229,007 kWh/yr	\$37,093	\$93,629	2.5 years
Total	1,410 MMBtu/yr (NG) & 792,313 kWh/yr (Elec)	\$133,624	\$149,980	1.1 years



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San Francisco State University ITAC
www.iac.sfsu.edu
(415) 338-6218