



# Vineyard 29

## 120-kW CHP System



### Quick Facts

**LOCATION:** St. Helena, CA  
**MARKET SECTOR:** Food and Beverage  
**FACILITY SIZE:** 17,000 square feet - building;  
 13,000 square feet - wine cave  
**FACILITY PEAK LOAD:** 120 kilowatts (kW)  
**EQUIPMENT:** Two 60-kW microturbines  
**FUEL:** Natural gas  
**USE OF THERMAL ENERGY:** Wine processing,  
 sanitation, building heating and cooling  
**CHP TOTAL EFFICIENCY:** 82%  
**ENVIRONMENTAL BENEFITS:** Decreased  
 maintenance and chemical, water and  
 energy usage  
**TOTAL PROJECT COST:** \$470,000  
**ANNUAL ENERGY SAVINGS:** \$25,000-38,000  
**FINANCIAL INCENTIVES:** \$260,000  
**PAYBACK:** 7 years  
**CHP IN OPERATION SINCE:** 2003

### Site Description

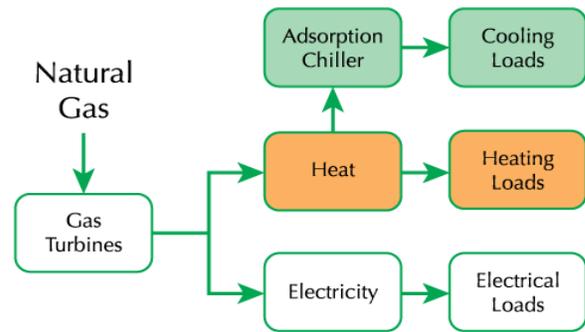
Vineyard 29 is located in St. Helena, Calif., in the Napa Valley wine growing region. Founded in 1989, the property was sold to Chuck and Anne McMinn in 2000 and the winery was constructed in 2003. Today, Vineyard 29 processes 100 acres of grapes to produce nine different wines, with a total production of 10,000 cases of wine annually. The site's total wine storage capacity is 1,000 barrels, which includes the Vineyard 29 brand and custom-crush clients.

### Reasons for CHP

When the owners were constructing Vineyard 29, they made a commitment to sustainable practices that reduce toxins and emissions from their winery and vineyards. They ultimately purchased a CHP system to generate all their electricity on site, produce less emissions than the local utility, and guarantee uninterrupted power during the critical harvest period. If the winery loses grid power, the CHP system can run in standalone mode within two minutes. For most of the year, the winery's CHP system is able to produce enough power to export excess to the grid; but instead, the equipment operators reduce power to match demand. The winery received \$120,000 in funding from SGIP. Other funding was received from the California Energy Commission. With these initial subsidies and the avoided costs of a backup generator (\$120,000) and a larger chiller (\$20,000), the effective net capital cost was \$210,000. The owners achieved a payback of 7 years, with an energy cost savings estimated at \$25,000 to \$38,000 per year, depending on the size of the harvest and the number of custom-crush clients.

## CHP Equipment & Configuration

Among the innovations deployed with the CHP system at Vineyard 29 is a 20-ton Nishiyodo absorption chiller, the first of its kind installed in the U.S. The Nishiyodo adsorption chiller uses recovered heat instead of electricity to produce cooled water like a conventional absorption chiller; however, the Nishiyodo does not require the use of lithium bromide (LiBr). The chilled water is used for cooling the building, wine caves and wine tanks. With the addition of the absorption chiller, the former electric chillers require only occasional use for supplemental cooling.



The winery derives all the hot and cold water for facility usage from its CHP system. To process each gallon of wine, three gallons of hot water are required. Hot water is also used to sanitize the facility and to run the absorption chiller that controls the fermentation process. Chilled water is used to run the air conditioning system during the summer. In the winter, the hot water is used for space heating in the building. The system has an overall efficiency of 82% when the waste heat recovery is included and has demonstrated an availability of 97% since commissioning, with minor operational issues.



Wine tanks heated by recovered CHP heat

## Lessons To Share

- Consider who will be responsible for providing system-wide optimization and maintenance of the system before the project begins.
- Don't overlook the software to control and monitor the whole system – design may include custom development that can add to project cost and time of implementation

*“Running your own electrical generation system is certainly more complicated than just ordering up more power from the grid, but it is far better economically and for the environment.”*

*- Chuck McMinn, Owner of Vineyard 29*

## For More Information

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