

CASE STUDY

Jackson Family Wines

Breaking New Ground in Sustainability

Family Winemaking Meets Environmental Stewardship

Founded in 1982 by San Francisco lawyer Jess Jackson, Jackson Family Wines (JFW) is one of California's largest family-owned winemakers, with some 1,100 employees operating 18 wineries in Napa, Sonoma, Monterey and Santa Barbara counties. JFW makes more than 35 brands of wine, including Kendall-Jackson, La Crema, Stonestreet, Byron, Cambria, Murphy-Goode, Matanzas Creek and Freemark Abbey. The company operates its main Kittyhawk bottling and storage facility in Santa Rosa and a regional distribution center in American Canyon, and farms 10,545 acres of vineyards.

The Jackson family has pioneered sustainable agriculture and winemaking practices going back 25 years. JFW's innovations include helping to develop a first-of-its-kind water recycling technology for barrel washing (expected to conserve two million gallons of water a year when implemented), the company's vineyards use drip irrigation exclusively, and all organic waste is composted, including vine clippings and crushed grape skins. JFW is also working with government agencies to protect endangered wildlife on 700 acres of land, and has planted 5,500 new trees in and around its vineyards.

Partnerships, Pilot Programs and Facility Audits

In 2008, JFW conducted full audits of all its facilities to identify opportunities for energy efficiency. They partnered with Energy Industries, a local sustainability engineering firm, to conduct a pilot program at the La Crema winery. JFW implemented a half dozen measures at La Crema, including a lighting retrofit, recommissioning refrigeration and compressed-air systems, installing new fan motors with variable frequency drives (VFDs) and installing zero-loss drains on receiver tanks.

The measures produced immediate annual savings of a million kilowatt hours and nearly \$140,000 in energy costs, and in response, JFW immediately launched an extended, company-wide efficiency campaign targeting its 13 largest facilities.

Savings Summary*

- Annual energy savings: Nearly \$3 million
- PG&E incentives awarded: \$900,000
- Annual kWh saved: 9.2 million



4,000 New Lights

JFW's first widely implemented measure was chosen for its low capital cost and quick paybacks—a lighting retrofit across 12 winery buildings and warehouses, with the Kittyhawk storage and bottling facility at the top of the list. JFW met with General Electric (GE) engineers to develop a lighting plan and chose GE's super-efficient fluorescent T5 and T8 lamps and ballasts for the massive project.

Over a six-month period, Energy Industries replaced the existing 400-watt metal halide fixtures with 4,000 high-efficiency T-5 lamps. The retrofit has produced annual energy savings of 320 kilowatts and more than 1.6 million kilowatt hours, and with PG&E deemed rebates covering 16 percent of the capital cost, simple payback for the project was less than six months.

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“Our business is focused on the land we farm and what we do with the grapes we grow, and we feel deeply connected to the environment. The Jackson family takes a generational view of sustainability, with a commitment to ensuring that the founders’ grandchildren will have healthy and productive vineyards and wineries to operate when their time comes. Environmental stewardship is a top priority.”

– ROBERT BOLLER, VP OF SUSTAINABILITY, JACKSON FAMILY WINES

Recommissioning, Compressed Air and Cooling

One of JFW's next major steps was to enroll in PG&E's Retrocommissioning (RCx) program, which provided engineering audits of air handling and cooling systems to identify retrofitting opportunities for enhancing energy efficiency. One such opportunity became obvious in an audit of the compressed-air systems that are, according to JFW's VP of Sustainability, Robert Boller, the “biggest energy eater in most wineries.”

In addition to pushing HVAC, refrigeration and glycol cooling pump systems, compressed air is used for bladder presses, which are inflated with air to precise pressures in order to squeeze the grapes gently, extracting their juice without damaging them. During crush operations, 100-horsepower motors power these presses.

JFW recommissioned six compressed-air systems and retrofitted a seventh by making the valves more efficient and the pressure controls more precise, enabling better demand management particularly during off-peak harvest usage. The measures, supported by a PG&E rebate covering 25 percent of the cost, are saving over a half-million kilowatt hours a year and paid for themselves in less than a year.

Based on RCx audit recommendations, JFW also recommissioned heating, air conditioning, ventilation and refrigeration systems at Kittyhawk, La Crema, the Monterey and Oakville wineries and the Vinwood winery in Alexander Valley. The measures, which are saving over a million kilowatt hours a year, included new temperature set points and pressure settings, as well as adjustments to glycol mixes in the refrigeration and cooling operations. The simple payback for the project was a remarkable four months, thanks in part to a PG&E rebate that covered more than 40 percent of the cost.

New Motors and VFDs

In terms of capital investment, JFW's most significant energy efficiency measure was the replacement of 104 old motors that drove air handling units, glycol refrigeration pumps, water pumps, cooling towers, condensers and compressors at the company's six largest facilities. Energy Industries installed high-efficiency, copper-wound Siemens and Baldor motors ranging from five- to 40-horsepower and equipped them with variable frequency drives (VFDs) from GE.





The VFDs are critical to reducing energy consumption because they allow the motors to ramp up slowly, reducing kilowatt draw, and because they can detect demand requirements and adjust motor speed accordingly. For example, a water pump supplying an entire winery that had previously operated at full speed is now equipped with a VFD with pressure sensors that can detect when only a couple of the facility's water taps are in use at a particular moment, requiring less pumping power.

The combination of new motors and VFDs reduced annual electrical consumption by 466 kilowatts and more than three million kilowatt hours. A PG&E rebate of more than \$345,000 covered 30 percent of JFW's capital outlay, ensuring a simple return on investment of a mere 16 months—extraordinary for such a capital-intensive project. Ten more high-efficiency motors with VFDs are scheduled for installation at various JFW facilities in 2012.

remote sensors as vehicles pass through. This simple measure is saving 300,000 kilowatt hours a year, and with a PG&E rebate covering 19 percent of the cost, payback will be less than two years. JFW is looking at installing similar doors at other facilities.

LEED Gold Warehouse and Tasting Room

JFW's sustainability partnership with PG&E has gone well beyond energy efficiency measures. In 2009, leveraging PG&E's Savings By Design program, JFW constructed a new Napa County Distribution Center in American Canyon. The 650,000-square foot facility, large enough to house ten Boeing 747s wingtip-to-wingtip, is the first refrigerated warehouse in the nation to achieve LEED Gold certification from the U.S. Green Building Council. The building is 38 percent more energy efficient than a standard distribution center, saving more than two million kilowatt hours a year in energy consumption. A Non-Residential New Construction rebate from PG&E covered 31 percent of the capital cost of the efficiency upgrades in the facility, and JFW's simple payback on the project was less than two years.

JFW also built the nation's first standalone LEED Gold tasting room, the Murphy-Goode tasting room in Healdsburg. In addition to purchasing renewable electricity to power the homes of its 1,100 employees, JFW has purchased 36 million kilowatt hours of green energy in 2012, allowing the company to achieve 100% renewable electricity for all of its operations. In 2011, they received a Green Power Leadership Award from the Environmental Protection Agency (EPA) for their overall energy management program, and the company is now pursuing LEED certification for every building that they own.

“PG&E's Retrocommissioning program is a fantastic program that brings to light the simple manufacturing practices that have been overlooked for far too long. These are things that operations managers often should have done long ago, and a Retrocommissioning audit helps push a centralized, consolidated effort to identify opportunities for energy savings.”

– ROBERT BOLLER, VP OF SUSTAINABILITY, JACKSON FAMILY WINES

High-Speed Automated Doors

Not all of JFW's energy efficiency measures have been so large in scope—some have been small but valuable projects, like replacing warehouse doors. Loading dock roll down doors are often left open all day as trucks come in and forklifts roll through, because employees are too occupied to close them. So JFW installed two new insulated, automated roll down doors—one each at its Monterey and Oakville wineries—which are opened and closed by



Demand Response

In 2009, Jackson Family Wines began participating in PG&E's Demand Response (DR) program, in which large customers commit to reducing energy usage on high-demand days to reduce the stress on the grid. JFW chooses to shut down virtually all operations in seven wineries—including refrigeration, air conditioning and lighting—to save 3.275 megawatts of electricity, enough to power 650 homes. Only fire detection and suppression systems stay on, unless the facility is conducting critical operations like receiving fruit.

In December 2010, JFW received a Demand Response rebate check for more than \$117,000 from PG&E, nearly matching the DR rebate it received in 2009. JFW also expects to save an estimated \$377,000 in energy costs in 2012 by implementing Demand Response measures on Peak Day Pricing days.

The Bottom Line

With its energy efficiency campaign just two years old, Jackson Family Wines is already saving nearly \$3 million a year in energy costs and has collected nearly \$900,000 in rebates from PG&E. The company has also dramatically reduced its carbon footprint by saving more than 9.2 million kilowatt hours a year, preventing more than 27,000 metric tons of carbon emissions into the atmosphere. That's the equivalent of removing over 4,800 cars from the highways.

Going Forward—Energy Management and Education

JFW is maintaining its aggressive energy efficiency program in 2012, and plans to install fully-automated Energy Management Systems (EMS) in its two major facilities. Each building's EMS will be connected to all the VFDs in that building to manage electrical demand, both by preventing multiple systems from coming on line all at once—which can happen during high-demand periods—and by cycling the various systems to maintain optimum levels. The EMS units will be linked to a centralized dashboard that displays real-time energy performance data from all facilities on a laptop or mobile device, enabling the entire system to be managed remotely. JFW expects the EMS initiative to reduce energy demand 20 percent across the connected facilities.

The company also plans to install two or more new "pony" portable compressed-air systems to further refine off-peak energy usage. The primary compressed-air systems operate at maximum 100-horsepower demand during grape pressing

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operations, but require less than five percent of those power levels for the rest of the year. Connecting the smaller 5-horsepower pony systems to the big systems makes managing lower-level demand much easier.

JFW has no intention of slackening its sustainability efforts. They continue to look ahead to new California emissions laws which will take effect in 2012, as well as the inevitable environmental changes caused by global warming, which will impact the entire \$16 billion California wine industry in the coming decades.

"I speak frequently at wine industry forums about energy efficiency programs, and what I tell them is that wineries have two tremendous opportunities available if they move forward immediately," stated Robert Boller. "The first is to start saving substantial amounts of money on energy right now, savings that will grow over time. And the second is to demonstrate leadership in sustainability and to derive the marketing benefit from that. If you wait until change is mandated, either by legislation or by consumer demand for sustainability, you lose that marketing benefit. So I encourage them to source the best expertise in the field, to find a strong third-party partner that works well with PG&E programs, and to pursue an aggressive energy program today."

JFW is committed to sharing its accumulated wisdom in winery energy efficiency. The company provided extensive funding and expertise to support the construction of the new \$15 million teaching and research winery at the University of California, Davis. Completed in July 2010, the UC Davis winery is the first winery in the world to achieve LEED Platinum certification.

Next Steps with PG&E

To learn how PG&E can help your winery promote sustainability, manage energy consumption and reduce costs, contact your local PG&E Account Representative, call our PG&E Business Customer Service Center at 1-800-468-4743, or visit www.pge.com/wineries.

*Energy savings and payment amounts provided by Jackson Family Wines.