Energy Efficiency

CHAPTER 9
Background

THE SUMMER OF 2008 once again reminded us that one of the biggest threats to any business is uncertainty. In a very short span of time, diesel prices climbed to almost $5.00 per gallon, a record price unseen by growers and vintners. At the same time, natural gas and propane prices soared, and then, just as quickly, the prices of all fuels tumbled down again.

The businesses that are the most vulnerable are those that are not tracking actual amounts of energy consumed. When prices fluctuate wildly, these businesses can be caught off guard. Worse, they haven’t planned how they can reduce energy inputs over time and therefore do not have a strategy or back-up plan for dealing with such volatility. Having metrics in place to measure how they can reduce energy inputs over time and there can be caught off guard. Worse, they haven’t planned

SUMMATION of the biggest threats to any business is uncertainty. In a carbon constrained world, this will become even more important, in both the regulatory arena and the marketplace.

One very simple place to begin is with an energy audit. Knowing how much energy each operation uses is the first step to creating a comprehensive energy management and conservation program. Once current energy demand is determined, conservation and efficiency strategies can be developed and implemented.

CHAPTER 9. ENERGY EFFICIENCY BENCHMARK DATA

Solar energy is the primary energy source for the fruit in the vineyards. More wineries each year are employing that same source to provide energy for their winemaking needs. In addition to solar panels on the roofs, there are now growing numbers of solar aerators in wastewater ponds and solar pumps in vineyards that expand the use of this universal power plant.

Energy conservation and efficiency strategies, as well as the use of alternative energy, can reduce the risk to volatile energy prices and unstable energy availability while saving money in the process. Best of all, the businesses that employ these strategies have great stories to tell in the marketplace about what they are doing to be part of the solution.

Benchmark Data

9-1. PLANNING, MONITORING, GOALS AND RESULTS To begin a comprehensive energy management and conservation program, a winery or vineyard needs to have a plan. 12% of growers and 20% of vintners have developed and implemented a comprehensive energy management plan that includes monitoring and recording total energy use. 3% of growers and 5% of the vintners have implemented at least half of their plan, while 9% of growers and 15% of vintners have implemented 25% of their plan. 18% of the growers and 33% of vintners have conducted an energy audit over the past two years and are using the results in their decisions on maintenance, improvements and employee training. 59% of growers and 44% of vintners have a general idea of their total energy use. 11% of growers and 3% of vintners replied N/A, not applicable or information not available.

9-2. REFRIGERATION SYSTEM One of the biggest consumers of energy in a winery is the refrigeration system. 31% of the vintners have conducted an energy audit of the refrigeration system during the past 3 years as part of an overall energy conservation plan, selected technologies for optimal performance and have taken measures (e.g. building insulation, night air cooling) to reduce chiller loads. 9% of vintners also use energy efficient technologies throughout the refrigeration system. 21% of the vintners have done an energy audit in the past 3 years and operate their equipment for optimal performance. 38% of the vintners have not had an energy audit in the past 3 years and operate their refrigeration system in the same way since installation. 10% of vintners replied N/A, not applicable or information not available. Some winemakers select their wine at a custom facility and therefore do not use refrigeration systems of their own.
9-3. TANKS & LINES Moving wine in and out of tanks and throughout the winery requires an enormous amount of energy. Understanding the amount of energy needed is the first step in being able to efficiently conserve energy at the winery. 49% of the vintners have conducted an energy audit of the tanks and lines during the past 3 years, insulate their glycol lines, equip some tanks with insulation jackets, and locate tanks to reduce cooling and heating needs. 21% of the vintners have conducted the audit as part of an overall energy conservation plan, insulate 50% or more of their tanks, and locate 50% or more of their tanks to reduce cooling and heating needs. 5% of vintners insulate and locate more than 80% of their tanks to reduce cooling and heating needs and incorporate energy conservation into their employee training programs. 41% of the vintners have not had an energy audit in the past 3 years and operate their tank system in the same way since installation. 10% replied N/A, not applicable or information not available.

9-4. MOTORS, DRIVES & PUMPS Awareness of overall energy consumption aids winemakers and winegrowers in targeting specific areas that consume the most energy. One of these areas includes motors, drives and pumps. 10% of growers and 22% of vintners have done an energy audit focusing on motors, drives and pumps as part of their energy management plan, with 3% of growers and vintners testing technologies to improve the energy efficiency of these devices. 25% of growers and 26% of vintners have done an energy audit in the past three years and maintain the existing equipment for optimal performance. 39% of the growers and 47% of the vintners haven’t done an energy audit and run the equipment the same as when they installed it. 26% of the growers and 5% of the vintners replied N/A, not applicable or information not available.

9-5. HEATING, VENTILATION & AIR-CONDITIONING (HVAC) One major energy user at the winery often overlooked for conservation potential is the HVAC system. 16% of the vintners have had an energy audit of the HVAC system in the past 3 years, reduce heating and cooling loads (e.g. louvred roof panels, temperature controlled cells), and have regularly scheduled maintenance. 3% of these vintners also record the maintenance, test new technologies and use energy efficient technologies throughout the HVAC operation. 32% of vintners have conducted an energy audit in the past 3 years, have regularly scheduled maintenance and operate existing equipment for optimal performance. 45% have not had an energy audit on their HVAC system and operate the equipment the same as when they installed it. 7% of the vintners replied N/A, not applicable or information not available.

9-6. LIGHTING – OFFICES & LABS Wineries have many more lighting needs throughout their operation than vineyards. For inside lighting of offices and labs, 10% of the growers and 29% of the vintners have had an audit in the past 3 years as part of an overall energy conservation plan, include lighting fixtures in the cleaning procedures, use compact fluorescent lights, and use task lighting. 6% of the growers and 8% of the vintners also use energy efficient lighting technologies and designs throughout the winery. 15% of the growers and 36% of the vintners have had an energy audit but do not include lighting fixtures in the cleaning procedures and use compact fluorescent lights in most locations. 37% of the growers and 32% of the vintners have not had an energy audit in the past 3 years and use the lighting system the same as when they installed it. 38% of the growers and 3% of the vintners replied N/A, not applicable or information not available.

9-7. LIGHTING – SHOPS & FACILITIES Some vineyards and wineries have large areas in shops and facilities that need to be lit. 12% of the growers and 39% of the vintners have had an audit in the past 3 years as part of an overall energy conservation plan, include lighting fixtures in the cleaning procedures, use compact fluorescent lights in most locations, and use task or natural lighting to illuminate work areas. 6% of the growers and 10% of the vintners also use energy efficient lighting technologies and designs throughout the shops and facilities. 14% of the growers and 27% of the vintners have had an energy audit but do not include lighting in the cleaning procedures and use incandescent lights in most locations. 42% of the growers and 32% of the vintners have not had an energy audit in the past 3 years and use the lighting system the same as when they installed it. 32% of the growers and 2% of the vintners replied N/A, not applicable or information not available.

9-8. LIGHTING – OUTDOOR & SECURITY Wineries have more of a need for outdoor and security lighting than vineyard operations. 12% of the growers and 31% of the vintners have had an audit in the past 3 years as part of an overall energy conservation plan, including lighting fixtures are part of the cleaning procedures, use of mercury vapor lights in most locations, incorporation of motion detectors into security lighting design, and consideration of sodium and/or sulfur lamps. 4% of growers and 5% of vintners also use sodium and/or sulfur lamps, clean the lights annually, and train security guards to turn off lights. 16% of the growers and 32% of the vintners have had an energy audit but do not include lighting in the cleaning procedures and use incandescent lights in most locations. 39% of the growers and 31% of the vintners have not had an energy audit in the past 3 years and use the lighting system the same as when they installed it. 33% of the growers and 6% of the vintners replied N/A, not applicable or information not available.
9-9. OFFICE EQUIPMENT

While wineries tend to have more need for office equipment than growers, it does consume energy and is part of the overall energy considerations for a vineyard or winery operation. 11% of the growers and 24% of the vintners include office equipment in their comprehensive energy management plan, turn off equipment when not in use, and consider energy consumption when upgrading or replacing equipment. 6% of the growers and 5% of the vintners test new technologies to improve office equipment efficiency and, whenever possible, purchase office equipment that is Energy Star certified. 11% of growers and 21% of vintners have had an energy audit in the past 3 years, turn off the equipment when not in use, and have management support for improving the energy efficiency of office equipment. 44% of growers and 50% of vintners haven’t had an energy audit and run their office equipment the same as when it was installed. 34% of growers and 5% of vintners replied N/A, not applicable or information not available.

9-10. ALTERNATIVE SOURCES OF POWER

With the increasing volatility of the energy delivery system, wineries can begin to ensure their own energy security by increasing the diversity of energy sources that they have available to power the winery operations. 12% of the vintners have selected an alternative energy source, have prepared a detailed financial plan, have had alternative sources assessed by a professional company, and have implemented an alternative source (e.g. solar, wind, methane digester). 28% have selected an alternative, prepared a detailed financial plan for solar, and have visited a site using an alternative energy source. 46% of vintners have an idea of where they get their energy and are researching potential alternative energy sources. 12% don’t know where their energy comes from and have a limited awareness of alternative energy sources. 2% of vintners replied N/A, not applicable or information not available.

9-11. ALTERNATIVE FUEL SOURCES

Farming equipment is a main consumer of energy in the vineyard. One way to reduce consumption is to switch to alternative fuel sources. While 72% of growers know how much fuel is used in the vineyard, 13% also track the use. In addition, 5% of growers are using at least one alternative fuel. 18% don’t know how much they use and know nothing about alternative fuels. 10% replied N/A, not applicable or information not available.

**PARDUCCI WINE CELLARS**, Mendocino County’s oldest family-owned winery, was the first winery in the United States to become carbon neutral in April 2007. They first implemented a comprehensive set of energy efficiency measures to reduce their energy consumption. For instance, they completed a free energy audit with Pacific Gas and Electric Company, and then converted to more efficient fluorescent lighting, upgraded equipment to energy efficient models and replaced old tank insulation. Parducci then switched to solar, wind, and bio-diesel to meet their energy needs. Working with the California Climate Action Registry, they calculated their greenhouse gas emissions and implemented practices to mitigate and offset their emissions. They purchase offsets for their remaining carbon emissions; the offset purchases help fund projects for methane capture, sustainable forestry, wind, solar and biogas.

In April 2008, Parducci supplemented its on-site renewable energy sources with Green-E® certified wind energy purchased from Bonneville Environmental Foundation. Since then all of Parducci’s energy needs come from non-polluting, renewable sources. In 2007, Parducci received the Governor’s Environmental and Economic Leadership Award for their efforts to help fight climate change.

Energy efficiency and carbon neutrality are only part of the sustainability story at Parducci. Their respect for the land and the natural environment is demonstrated by many of their other sustainability practices, including their earth-friendly packaging, Organic, Biodynamic and Fish Friendly Farming certifications, employee education programs, composting, water conservation and water recycling projects. As Partner Paul Dolan states, “We are clear about what we want – an environmentally and socially conscious winery making great wines from Mendocino.”
Comparative Results & Next Steps

THE FOLLOWING shows average scores from the 2004 Sustainability Report and the change in those scores since 2004. For vineyards, 7 out of 7 criteria increased with a maximum increase of 15% in criterion 9-11 Alternative Vineyard Fuels. Vintners improved in 7 out of 10 criteria with a maximum increase of 29% in criterion 9-10 Alternative Power Sources. Despite this result of improved performance, growers and vintners should continue to assess their operations and implement site-specific plans to continuously improve the sustainability of practices for energy efficiency.

To drive additional improvements in energy efficiency, CSWA needs partners. If you are interested in energy efficiency, please email info@sustainablewinegrowing.org.