

Defining 'Sustainable'

What does it really mean for the wine industry?

By Bruce Zoecklein



The word "sustainable" was adopted by the wine industry several years ago, and it has since become common vernacular. Never fully defined at the outset, it meant different things to different people, which was likely part of its appeal. It added a virtuous "green" dimension to winemaking, which often represented some nebulous combination of ecology and the environment. For some, it was a new way of packaging an old idea: corporate social responsibility.

For those in the wine industry today, "sustainable" usually means some professed environmental emphasis on energy, water, chemical and/or packaging management.

According to architect Joe Chauncey, who gave a presentation on the subject at the Wineries Unlimited conference in 2008, a sustainable winery could be one with the following features:

- Ecologically responsive
- Economically viable
- Good neighbor
- Bioregional (a political, cultural and environmental system based on naturally defined areas called "bioregions")
- Healthy and sensible
- Operationally efficient

There are, of course, levels of ecological and environmental sustainability building practices. LEED certification, for example (Leadership in Energy and Environmental Design), has a range of 25-69 attainable points. The number of points determines the level of certification: Basic, Silver, Gold or Platinum.

More often than not, the activities that have gone under the winery sustainability banner in the last several years have only tenuously related to water, energy, chemical and/or packaging management. Many wineries have appointed "sustainability officers" and printed brochures on recycled paper, with pictures of the beautifully green nature of our industry – or at

AT A GLANCE

- The term "sustainability" is common vernacular in the wine industry, but it hasn't been fully defined.
- "Sustainable" usually refers to an environmental emphasis on energy, water, chemical and/or packaging management.
- Environmental and ecological aspects of sustainability are site- and operational-specific.
- The link between economic sustainability and environmental sustainability will strengthen only through technology and education.



least worked to help maintain that image. But are such efforts truly what define a sustainable winery?

SUSTAINABLE PRACTICES FOR WINERIES

Winery ecological and environmental sustainability usually

includes some of the following practices:

- LEED certification
- Use of eco-friendly building materials
- Earth-sheltered buildings
- Green roofs

- Building orientation/insulation
- Brise soleil (a sun baffle of louvers outside the windows or extending over the entire surface of a building) or solar blocks
- Alternative energy, including geothermal, solar and wind
- Energy/heat capture and recovery
- CO2 capture
- Natural lighting and venting
- Rainwater collection
- Water recycling
- Materials recycling

Regardless of how sustainability is defined, it is not formulaic. Environmental and ecological aspects of sustainability are site- and operational-specific. Questions to ask include: What is your philosophical disposition with regard to ecology and the environment? What is the true measure of your impact, your footprint at your location?

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THE NEED FOR SUSTAINABILITY METRICS

As an industry, we need to quantify our ecological and environmental sustainability activities; otherwise, we may be guilty of contributing to the cascade of "green-washing" evident in our society. The advantages of quantification and benchmarking lie in our ability to measure, contrast and chart our true progress. A number of matrices should be reviewed, including those suggested by P. Michael, et al. in the article "Benchmarking Winery Production: Developing Benchmarks," published in the Australian and New Zealand Grape Grower and Winemaker (2009).

- Wine volume per ton
- Total energy consumed/tons produced
- Water consumed/volume of wine produced
- Personnel hours per ton
- Wastewater COD (chemical oxygen demand) and BOD (biochemical oxygen demand) per ton

Wineries need to properly compare and contrast their facilities and performance against others in order to create a benchmark. They must understand the importance of scaling. For example, energy and water use should be evaluated within a relative production volume or scale, if we are going to compare different-size wineries. According



Using natural lighting to reduce energy use can help wineries save money while promoting sustainable practices.

to Roger Boulton of UC Davis, who gave a presentation on green production practices at the 2009 Unified Symposium conference, large wineries generally have a smaller surface area per wine volume produced than small wineries. This is highly relevant in benchmarking and comparing the energy and water use within our industry.

Carbon dioxide emissions, on the other hand, can be compared directly, based on tons crushed or fermentation volume. In the absence of energy and water scaling, our industry will not be able to accurately establish benchmarks or

evaluate progress in environmental and ecological sustainability.

ENVIRONMENTAL AND ECONOMIC SUSTAINABILITY

By 2009, sustainability began to take on a new ethos that also placed emphasis on economics. To sustain profits, virtually everyone in our industry continued to attempt to cut costs. At the same time, there is evidence that a percentage of our consumers became less and less prepared to pay extra for a sustainably produced wine. In these circumstances, many producers were tempted to slow down their green initiatives, while still marketing the panache of green. And all the while, they emphasized the value of their products and economic enhancements, such as winery tourism.

However, the forces that initially motivated the wine industry to be concerned about the environment have not changed and will not disappear. These environmental and ecological practices relate directly to economic sustainability in at least four areas, as suggested by Ken McCorkle of Wells Fargo Bank and Tom Selfridge of the Hess Collection winery during their 2009 Unified Symposium presentation,

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"Why Business Is Embracing Sustainability":

- Product differentiation – Many wineries use sustainable architectural features as a means of branding.
- Risk management – Becoming less dependent on energy and water use means that a business can be somewhat buffered from the volatility of price and availability.
- Responding to government regulations – If our industry is not pro-active, we may find ourselves facing impossible peak-use demand surcharges and use restrictions. For example, the Environmental Protection Agency has announced carbon dioxide monitoring of the wine industry to understand our current contribution to greenhouse gas emissions.
- Lowering production costs – Because of the direct positive correlation between ecological and environmental sustainability and economic sustainability, establishment of a sustainable feature can certainly impact winery operational costs. A common example is natural lighting. According to Chauncey, artificially lit buildings average about 1.5 watts per square foot, whereas a day-lit building would use 0.33-0.5 watts per square foot, making the savings range 1.0-1.22 watts per square foot.

The link between ecological/environmental and economic sustainability is well established. Economic sustainability has several vectors worth noting, including sound decision-making, technology and education, and a realistic understanding of product value.

SOUND DECISION-MAKING

Sound decision-making refers to how we make choices. Philosophically and practically, what information is certain and why? Leo Szilard,

responsible in part for our understanding of quantum physics, once told a colleague he was thinking of writing a diary, but not for publication. "I simply want to record the facts for God." His colleague asked if he thought God already knew the facts, and Szilard replied, "Yes, but he doesn't know my version of the facts." This illustrates a fundamental issue: the subjective, selective and tangential use of information to support our preconceived ideas.

By the mid-17th century, French Enlightenment philosophers suggested two basic means of understanding the world, roughly categorized by the rational deductive principles of Rene Descartes and the inductive, empirical reasoning suggested by John Locke. This dichotomy remains today. It is evident in our industry by the contrast between those who derive their understanding mainly from science-based knowledge vs. those who rely largely upon empirical observations.

To many, our real knowledge is derived from our own observations and experiences. In a craft as old as winemaking, decisions based upon experience are certainly important. However, one person's observations and experiences, under their particular conditions, are not necessarily representative of others'.

In a meeting several years ago, viticulturist Richard Smart commented about "pub talk" (empirical observations shared, which may not apply to others' circumstanc-

es). He contrasted this with scientifically derived information. For example, he posed the following popular beliefs in the wine world:

- Low yields give better wines.
- Small berry size is important for wine quality.



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Are these statements true and, if so, when, and under what conditions? Information derived from untested opinions should be differentiated from scientifically derived truths. Such a differentiation is essential to sound decision-making.

WHERE EMPIRICAL AND SCIENCE-BASED DATA MEET

HACCP (hazard analysis and critical control points) is a method to help make sound decisions by linking both empirical observations and science-based data. HACCP is the controlled integration of chemical,

physical, microbiological and sensory analyses into a formal plan. HACCP planning helps one understand the complex relationships among the kaleidoscope of grape-growing and winemaking variables. Those who employ HACCP perhaps have a core belief that luck is the residue of design. However, to others, HACCP seems contra natura, too technocratic and hostile to artistic winemaking.

However, one of the problems with relying too heavily upon empirical observation is that if two outcomes are similar, we have a tendency to assume they must have a similar cause. This may or may not be correct. The core principle of a HACCP-like approach goes

back to Francis Bacon, who reminded us, "Genius is like fleet of foot, method is the right path. Fleetness of foot on the wrong path never leads to knowledge."

The concept of HACCP, breaking problems down to component parts, is a scientific view at the core of our optimism. We no longer look for miracles, we look to models for simplification and quantification. After all, if we can understand the universe in mechanical terms, surely we can understand almost anything.

However, a complex system such as wine is not simply a collection of components. HACCP, therefore, is simply a tool to help extend our understanding.

TECHNOLOGY AND EDUCATION

Technology and education are economic sustainability vectors. To demonstrate, answer the following questions:

- How has technology impacted your business?
- How are new technologies created?
- How is that information transferred?
- Why do some people embrace changes, while others do not?

The link between economic sustainability and environmental sustainability will strengthen only through technology and the implementation of technology through education.

Without question, water, energy, chemical and packaging management will become increasingly



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important in our industry. To help us understand the potential of ecological sustainability, Roger Boulton and his colleagues at UC Davis are developing the first Platinum LEED winery. This unique operation is designed to be self-sustainable and will help to set industry standards for winery operations. According to Boulton's presentation at the 2009 RAVE conference, held at UC Davis, examples of several relatively new technologies include the following:

- CIP (clean in place), pigging systems
- Capture solutions and green chemistry solutions
- Electrical dialysis for cold stabilization
- In-line white juice flotation for clarification
- Protein adsorption columns to eliminate bentonite fining

The link between economic sustainability and environmental sustainability will strengthen only through technology and the implementation of technology through education.

UNDERSTANDING PRODUCT VALUE

Bishop George Barkeley, an 18th century empiricist, argued that our only knowledge of the world is what comes to us through our senses: "To be is to be perceived." The problem, of course, is that our

senses are not always reliable. This poses a difficulty with regard to sensory evaluation of wines. Even if our senses were objective and reliable, many wineries often do not conduct sensory evaluations in concert with maximizing or optimizing their economic sustainability.

We have seen a decline in the price of some ultra-premium wines with the current economic reality. Proper sensory evaluations are key to understanding relative value, which is how the price/quality ratio stacks up to comparable products in the marketplace. Sample contrasting – the blind comparison of wines against others in the marketplace – is also important.

Additionally, there should be a clear distinction made between so-called expert opinions (winemakers, wine competition judges) and consumers. There is an increasing body of evidence that suggests that expert opinions are very different from consumer opinions. Our knowledge of this must increase if we are going to tailor wines to target consumer preferences. Certainly, optimum sensory evaluation and the understanding of relative value are economic sustainability vectors.

An integration of sustainable thinking in design and practice has emerged. Environmental and ecological sustainability are tied intimately with economic sustainability, which is impacted by sound decision-making, technology and education, and a realistic understanding of product value.

The forces that motivated the wine industry to be concerned about traditional sustainability (image, popular trepidation about global climate changes and the general need for optimum energy, water, chemical and packaging resource management) have not and will not disappear. New technologies may aid in our attempts to become more environmentally efficient. We must acknowledge that it is what we learn after we know it all that really counts. ■

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