



Glossary of Terms:

- **Biogas Recovery System**– System that captures the methane biogas produced during the fermentation process of brewing beer. Breweries can then utilize this gas for heat and power generation – reducing the operating costs of the brewery while reducing pollution.
- **Carbon Equivalent**- A metric measure used to compare the emissions of different greenhouse gases based upon their global warming potential (GWP). Greenhouse gas emissions in the U.S. are most commonly expressed as "million metric tons of carbon equivalents" (MMTCE). Global warming potentials are used to convert greenhouse gases to carbon dioxide equivalents.
- **Closing the Loop**– Emerging idea that keeps waste products out of landfills. Essentially, closing the loop is recycling an output (waste) of a process into an input for another process. For example, brewers can use the spent grains from the brewing process to create energy from biogas.
- **Cogeneration**– Captures heat lost during the production of electricity and converts it into useful thermal energy, usually in the form of steam or hot water. Co-generation systems are typically 60-80 percent efficient which is significantly more efficient than the traditional power plant efficiency of approximately 30 percent. These efficiency gains also result in cost savings, reduced air pollution and greenhouse gas emissions, increased power reliability and quality, reduced grid congestion and avoided distribution losses (Yale Office of Sustainability).
- **Corporate Sustainability Report**– A periodic report published by a company to outline its progress toward meeting its financial, environmental, and social sustainability goals; often published in compliance with third-party standards such as the UN Global Compact or Global Reporting Initiative.
- **Energy Star Certification**- ENERGY STAR is the trusted, government-backed symbol for energy efficiency helping us all save money and protect the environment through energy-efficient products and practices. The Energy Star label was established to:
 - Reduce greenhouse gas emissions and other pollutants caused by the inefficient use of energy
 - Make it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.
- **Fuel Cell**– Electric cell in which the chemical energy from the oxidation of a gas fuel is converted directly to electrical energy in a continuous process. The efficiency of conversion from chemical to electrical energy in a fuel cell is between 65% and 80%, nearly twice that of the usual indirect method of conversion in which fuels are used to heat steam to turn a turbine connected to an electric generator.
- **Grid Connection**- Joining a plant that generates electric power to a utility system so that electricity can flow in either direction between the utility system and the plant.
- **Photovoltaics**– Technology in which light is converted into electrical power. It is best known as a method for generating solar power by using solar cells packaged in photovoltaic modules, often electrically connected in multiples as solar photovoltaic arrays to convert energy from the sun into electricity.
- **Renewable Energy Credits**- A REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source. At the point of generation, both product components can be sold together or separately, as a bundled or unbundled product. In either case, the renewable generator feeds the physical electricity onto the electricity grid, where it mixes with electricity from other generation sources. Since electrons from all generation sources are indistinguishable, it is impossible to track the physical electrons from a specific point of generation to a specific point of use.
- **ROI- Return on Investment**- A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments.
$$ROI = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$
- **Turnkey Solution**- A type of solution that is easily or readily deployed into a current business, system or process by a third-party, which is able to be used immediately once installed or implemented.





Examples of Renewable Energy at Breweries and Wineries

- [Sierra Nevada Brewing Company](#)
- [New Belgium Brewing](#)
- [Outer Banks Brewing Station](#)
- [Brooklyn Brewing Company](#)
- [Mother Earth Brewing](#)
- [Full Sail Brewery](#)
- [Steam Whistle Brewing](#)
- [Cogentra Solar and Sonoma Wine Case Study](#)
- [Sonoma Wine Company](#)
- [J. Lohr](#)
- [Certified California Sustainable Winegrowing Participants](#)
- [Anaba Wines](#)
- [Stratus Wines: First LEED-certified winery in North America](#)

Reference Websites for Breweries and Wineries

- [Energy Efficiency Improvement and Cost Saving Opportunities for Breweries](#): An Energy Star Guide to efficiency and cost savings, provide specific primary energy savings for each energy efficiency measure based on case studies that have implemented the measures, as well as references to technical literature .
- [BEST-Winery Benchmarking and Energy and Water Efficiency Savings Tool](#): Calculates an energy intensity index (EII) and water intensity index (WII), performance indicators that compare the user's winery to a benchmark or reference facility.
- [Sustainable Appalachian Viticulture Institute](#): promote the research, development, propagation and planting of cold-hardy and disease resistant grape cultivars in vineyards in the Appalachian Mountains using sustainable farming methods including organic and biodynamic methods.
- [North Carolina Brewers Guild](#): Beer and brewery news from around the state.
- [North Carolina Wine and Grape Council](#): State website promoting wine tourism in North Carolina.
- [California Sustainable Wine Growing Alliance](#): Promotes the benefits of sustainable winegrowing practices, enlist industry commitment and assist in implementation of the Sustainable Winegrowing Program.
- [Caron Neutral Challenge](#): An effort by Oregon wineries and vineyards to measure, track, and reduce their greenhouse gas emissions and overall environmental impact, with the ultimate goal of becoming carbon neutral .
- [Solar Power Rocks](#): Resource providing a state-by-state examination of tax credits, rebates, and incentives for solar power installation.
- [Blue Map](#): Efficiency benchmarking tools for breweries.
- [Beer and Pub Green Brewing Guide](#): British Beer and Pub Association's guide to green brewing in the United Kingdom
- [Napa Green Certified Winery](#): An independent third party certification program to encourage and assist Napa Valley vintners and grape growers to implement beneficial and verifiable environmental practices .
- [6th Annual Best Practices for Owning & Operating a Winery](#): Upcoming annual conference in Napa, California.
- [Worldwide Brewing Alliance Report 2011](#): Guide detailing brewing sector initiatives in environmental sustainability.
- [North Carolina Winegrowers Association](#): Non-profit organization that supports North Carolina's wine industry.
- [Energy Trust of Oregon](#): Guide to efficiency incentives for winemakers in Oregon.
- [RETI website](#): The home page for the Renewable Energy in Tourism Initiative. Provides links to previous webinar recordings as well as supplemental materials.

