

Sustainable Practices for Virginia Wineries

A pilot project to assist Virginia's wine industry in their efforts to be more sustainable.



*Funding for the pilot project is from the U.S. Environmental Protection Agency.

Sustainable Practices for Virginia Wineries is a pilot project funded through a grant from the U.S. Environmental Protection Agency. The project is administered through the Manufacturing Technology Center in Wytheville, Virginia and it involves partnerships and support from Virginia Tech's Grape Chemistry program, the Virginia Department of Environmental Quality, and Virginia Green, the state's partnership program to encourage green practices in its tourism industry.

The goals of the project are to (1) document ongoing sustainable practices at several Virginia wineries, (2) identify opportunities that will reduce environmental impacts, save money, and improve profitability; and (3) publish a report that details these findings so that other Virginia wineries might learn from these techniques, including summary fact sheets of the wineries involved with recommendations for future research.

Each winery included in the project receives a technical assistance visit from the project team. This summary provides only preliminary findings as the project team continues to work with the winery to research and propose specific practices and projects that will result in environmental benefits and cost savings.

Subject Winery:



North Gate Vineyard is located in Purcellville, Virginia. It is owned and operated by Mark & Vicki Fedor, who built the winery and tasting room in 2011. The tasting room and the production and storage operations are all housed in the same 5600 square foot building. Current production is 4500 cases annually. The evaluation team visited North Gate on May 21, 2013.

Sustainable Practices in Place

Certifications

- Building is built to meet LEED-GOLD certification standards.
- North Gate Vineyard is certified Virginia Green Winery*.
- North Gate Vineyard won the 2012 Virginia Green Travel Leader Award.



Wastes

- Wastes and single-stream recycling is picked up weekly by a local hauler
- Residuals from production are composted on-site in the vineyard
- System of plastic pallets is used to minimize pallet waste disposal
- Recycling of cork and use of composite corks
- High-efficiency hand-dryers avoid the use of paper towels and have reportedly saved approximately \$100/month in purchases.



Energy

- Solar-Power
 - The entire building is powered by its 22-kw photovoltaic solar system consisting off with 96 solar panels on the south facing roof.
 - The panels are not built on top of a traditional roof, but rather are built as part of the roof structure.
 - Custom designed system of inverters provided for efficient conversion to AC power and for grid interface.
 - System is tied into the grid and building is a “net-zero” user of energy.
- Insulation
 - 4 inch concrete slab with 2 inch greenboard insulation underneath.
 - Highly insulated building envelope: R39 walls, R51 ceiling.
 - EnergyStar-rated windows and doors.
- Extensive use of natural lighting in the tasting room
- EnergyStar-rated dishwasher, refrigerator, hot-water heater, and hand-dryers
- High-performance HVAC (19 SEER)
- Programmable thermostats in several zones
- Efficient Lighting
 - LED's, T5 fluorescents and LED exit signs
 - High-efficiency metal halides in production / storage area.



Water

- Native and drought tolerant landscaping (no irrigation system)
- High-efficiency toilets and fixtures



Additional Sustainable Practices

- Many locally-sourced, reused, and/or sustainable building materials such as:
 - Crushed glass countertops
 - Reclaimed wood tables and mantle
 - Bamboo flooring
 - Fireplace from local stone
- No / low VOC building materials, including paints, sealants, and adhesives
- Sustainable, non-toxic cleaning supplies



Customer Engagement Areas

- Well-labeled recycling and trash containers located together
- TV monitor in tasting room displays and explains solar power production



- Cheeses, breads, and other food items are from local farms, shops, etc.
- High-efficiency hand dryers
- Single stream recycling
- Virginia Green certificate and decals displayed

Opportunities for Improvement

Environmental Program Tracking

Currently, only energy use is tracked. We generally recommend tracking and/or metering of environmental data so it might be used to set goals and gauge continued progress over time.

- **Wastes & Recycling.** Currently no information available.
 - Recommend waste audit or estimates using average weights to establish baseline data for wastes and recycling (reference EPA site).
- **Energy.** Solar energy system is a “net zero”, but we recommend that positive income be fully tracked.
- **Water.** Water is well water and there is currently no information available on water use.
 - Recommend water metering during wine production and for other uses.
- **Carbon Footprint.** Waste, energy, and water data (and some other factors such as travel) can be used to calculate overall carbon emissions.

	2011(baseline)	2012	2013	Goals for 2014
Wastes +Recycling				
Energy Used				
Water Use				
Carbon Footprint				

Energy

- **Refrigeration.** Tanks not currently insulated.
 - Recommend full consideration of tank blankets, sprays, and other measures.
- **Tanks.** Tanks are constructed with a minimal insulation.
 - Recommend full consideration of tank blankets, sprays, and other measures.
- **Lines.** Refrigeration and chiller lines are isolated.
 - Recommend that all chiller lines be insulated.
- **Winemaking / Stabilization.** Currently, stabilization occurs through refrigeration.
 - Recommend full consideration of bitartrate stabilization techniques that will minimize refrigeration demands.
- **Winemaking / Chilling of Grapes.** Currently the winery does refrigerate grapes for certain types of dessert wines, but does not generally refrigerate other grapes prior to production.
 - Recommend pre-chilling all grapes that will need stabilization in order to minimize cooling needs.
- **Compressor.** Tank transfers occur with help of compressors that adds to heat load in the production and storage area.
 - Recommend operating the compressor outside.
- **Natural Lighting.** Currently, no natural lighting in the storage / production area.
 - Recommend consideration of sky-lighting.
- **Lighting.** Metal halide lighting in storage / production room is a significant producer of heat.
 - Recommend practices to limit use, such as motion-activated sensors.



Water

- **Barrel and tank cleaning.** As mentioned, there is currently no available data on water use. Owners are aware of water cleaning needs and use high-pressure cleaning process.
 - Recommend installation of a meter and documentation of water use in cleaning procedures.
- **Rainwater Collection.** Currently, there is no system of collecting and reusing rainwater.
 - Recommend full consideration of collection system that could involve collection tank, rain barrels, etc and be used for irrigation and wash-down purposes.
- **Stormwater.** Wineries are categorically required to get stormwater discharge permits if wastewaters from production, parking areas, or other operations are directed directly to streams, ponds, wetlands, etc.
 - Recommend full consideration of this regulatory requirement prior to future expansions.

Wastes

- **Universal and hazardous wastes.** Currently, there is no system for documenting the generation and management of spent fluorescent lamps, solvents, aerosol cans, batteries and other-potentially hazardous materials.
 - Recommend:
 - Development of a policy, log, and records that document proper handling of these items.
 - Include development of a green purchasing policy that requires consideration of hazardous properties and regulatory considerations.
- **Recycling Rates & Management.** 4 (four) 96 gallon single-stream recycling containers and 2 (two) 96-gallon trash containers are picked up once a week, but no weights are currently provided by the hauler and therefore no recycling rate has been established.
 - Recommend:
 - Develop estimates of generation based upon weight standards and consider “how full” the containers are. This will provide an implied recycling rate and insight for adjusting hauler services, saving money, etc.
 - Consider performing a **waste stream audit** to determine actual weights of trash and recycling and to identify waste reduction opportunities and needs for specific waste items.

	<u>Containers</u>	<u>AVG wt</u>	<u>Weekly</u>	<u>Annual</u>
Mixed Recycling	4 (full)	80 lbs	320	16,640 lbs
Trash	2	110 lbs	220	11,440 lbs

Implied Recycling Rate = 60%
(http://www.epa.gov/osw/conserves/tools/recmeas/docs/guide_b.pdf)

- **Composting of Food & Disposal Wastes in the Tasting Room.** Currently, the winery minimizes disposals through the use of reusable glasses and dishware. However, significant quantities of food wastes and disposables are generated during weekend events and catering.
 - Recommend consideration of food composting opportunities. Various haulers in the region are now providing for cost-effective pick-up services that could significantly reduce waste generation.
- **Bottles & Corks.** Currently, the winery uses a combination of real / composite corks for all of its varietals (and it does provide for cork recycling). It has also uses standard-sized bottles.
 - Recommend consideration of corking options that minimize wastes:
 - Screw tops
 - Plastic corks
 - Sleeveless (eliminating use of metal wrappers)
 - Recommend consideration of bottles that are lighter, from recycled glass, or from other materials (ie, boxes, etc).

Customer Engagement Areas

- **Communication of environmental information.** The winery does a good job of communicating its environmental commitments and its certification as a Virginia Green Winery on its website and at the winery. In addition, they do an excellent job of sharing information related to their solar power generation. We also recommend:
 - Including additional promotional information regarding your LEED certification, environmental program, Virginia Green, and other local green attractions, etc.
 - Consider development of green getaway packages or other arrangements to appeal to green consumers who want to support your efforts and others with similar commitments.



*Virginia Green Winery certification is achieved through self-certification process and all green practices and commitments are documented in the winery's Virginia Green "profile" that is available to the public at <http://www.deq.virginia.gov/Portals/0/DEQ/PollutionPrevention/VirginiaGreen/Winery/NorthGate.pdf>. The Virginia Green program challenges consumers to provide constructive feedback that will encourage its partners to continuously improve over time.