

# Best Practices for Sustainable Winemaking: A Fact Sheet

*Learn how to operate a more sustainable winery using these proven practices to reduce energy, chemical, and water use, and improve wastewater and solid-waste management.*

## Become more energy efficient.

Most of a winery's energy is driven by lighting and refrigeration. While there is no simple way to replace these essential systems, it is possible to make them more efficient.

### Best practices:

- » Ensure that your refrigeration system's walls, piping, and tanks are insulated to lower energy demand.
- » Use fans to facilitate cooling and to distribute heat more evenly.
- » Decrease the head pressure of your chiller during winter months to improve performance.

- » Perform regular, preventative maintenance on all equipment.
- » Upgrade to LED (light-emitting diodes) lighting where possible.

### Take it a step further.

Renewable energy sources, like solar and wind, can complement energy-efficiency measures to significantly lower on-site generation of greenhouse gas emissions. Additional information is available at:

[NYSERDA Renewable Technology Programs & Incentives](#)

[EPA Clean Energy Programs](#)

[U.S. Department of Energy Renewable Energy](#)



## Rethink your cleaning chemicals.

Many chemicals that are used to clean equipment and facilities at a winery can harm the environment and human health when they enter local water sources. Sustainable alternatives can lower the impact of chemical use, while different cleaning methods can reduce the volume of chemicals needed to support a sanitary operation.

### Best practices:

- » Swap inorganic acids, like sulfuric and nitric acid, for a safer, milder acid like citric acid.
- » Replace traditional sanitizers, like chlorine, with less toxic alternatives such as peracetic acid (PAA).

- » Eliminate strong caustics and acids by using safer chemicals like Sterox and Destainex, which are formulated for wineries.
- » Rotate chemicals to maximize effectiveness. Rotation promotes the removal of debris and micro-organisms that are not effectively handled by a single chemical. It also minimizes the effects that use of a single chemical may have on equipment or surfaces in the long term.
- » Chemicals may be completely avoided when cleaning stainless steel tanks and barrels by using a high-pressure steam cleaner.



## Give pomace a second life.

Pomace accounts for most of the solid waste left behind by winemaking: grape skins, pulp, stems, and seeds. This material can be used for many value-added purposes.

### Potential opportunities:

- » **Livestock feed:** Farmers can use pomace as a high-fiber feed for cows, sheep, horses, and some smaller animals.
- » **Grappa:** Pomace can be used to make this distilled liquor.
- » **Biogas:** As an organic material, pomace is a good feedstock for anaerobic digestion, a process that can be used to create biogas, a sustainable fuel.
- » **Biochar:** Pomace can be used to capture carbon by making biochar, a rich soil additive made by burning organic waste in a nearly oxygen-free chamber.
- » **Grapeseed oil:** Food manufacturers can produce this popular cooking oil from pomace.
- » **Food additive:** Pomace contains chemicals that can serve as a baking ingredient or preservative.
- » **Medicinal uses:** The polyphenols found in pomace can be extracted to make pharmaceutical and dental-hygiene products with anti-inflammatory, -oxidant, and -cancer properties.



To identify pomace waste outlets for livestock feed, contact local farmers. To evaluate other pomace waste opportunities, contact NYSP2I.



## Reduce water use.

The majority of water at a winery is used for cleaning. Often, this includes hose-spraying equipment, floor-cleaning using pressure washers, and steam-sanitizing barrels.



### Best practices:

- » Use dry, water-free cleaning methods, like sweeping and scraping, whenever possible.
- » Use low-flow hose nozzles and high-pressure cleaning when water must be used.
- » Reuse clean water, such as final-rinse water, whenever possible, like for washing floors.



# Manage and treat waste water appropriately.

Two types of wastewater are typically found at a winery: One is process wastewater, which is produced as a result of winemaking (e.g., harvesting, pressing, and fermentation), bottling, general washing, and other larger scale operational activities (like running a restaurant or event venue). The other is sanitary wastewater, which is generated by bathrooms, kitchens, tasting rooms (e.g. small scale serving of prepared food), and other general plumbing.

The first step in sustainably handling wastewater is to manage the process wastewater and sanitary wastewater separately, especially if no municipal sewer is available. This is because process wastewater can be higher in organic and nutrient strength than sanitary wastewater and can overwhelm sanitary septic systems that are typically used when a sewer is not available.

## Wastewater management options:

- » If municipal sewers are available, all wastewater can be discharged with a proper pretreatment discharge permit. Pretreatment requirements will depend on the size of the municipal wastewater treatment plant discharged to.
- » For discharge to sewer system, coordinate with your local municipality to identify if a pretreatment permit may be required for discharge to local sewers.

*If a municipal sewer is not available, then, with proper discharge permits, you may do the following:*

- » Treat process wastewater then combine with sanitary wastewater for discharge to a subsurface or groundwater source (e.g., a septic system or a leach field).

- » Separate organic containing process wastewater from chemicals, contaminants, and sanitary wastewater so it can be seasonally applied to land with a permitted spray-irrigation system or Part 360 Series permit as agricultural waste.
- » If septic system is not available or volume of wastewater is too large for subsurface disposal, treat process wastewater and then discharge it to surface water sources, if available.
- » If direct discharge is not possible, collect process wastewater in storage tanks and send it to an off-site treatment facility. Be sure to keep rainwater out of wastewater storage tanks to reduce disposal costs.

If a municipal sewer is not available, then, with proper discharge permits, you may do the following:

- » Wastewater discharges in New York State are regulated by the New York State Department of Environmental Conservation (NYSDEC). NYSDEC requires and issues state pollutant discharge elimination system (SPDES) permits for all subsurface and surface discharges. You will likely need to secure a SPDES permit or a Part 360 Series permit.

**To learn more about managing waste water, permitting, and wastewater types, download [Guidelines for Managing Winery Waste Water](#).**

**The Winery Sustainability Workbook provides best management practices that wineries can implement to reduce environmental impacts associated with the use of water, energy, and chemicals.**



## Untap New York

Want to learn more about NYSP2i's craft beverage sustainability program? Visit our website to find case studies and discover unique sustainability resources designed for wineries, breweries, cideries, and distilleries.

**web:** [rit.edu/nysp2i/untap-ny-craft-beverage-sustainability](http://rit.edu/nysp2i/untap-ny-craft-beverage-sustainability)

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