



# P2: Pollution Prevention

## Brewing Success with P2 Grantees

October 2020



### Brewery Industry Profile

Beer production yields significant quantities of waste byproducts, wastewater effluents, and air emissions that can be costly—both financially and environmentally—to the brewer and its community. Breweries regularly discharge large volumes of waste beer, wort (unfermented beer), yeast, and grains into a wastewater system, incurring expensive permitting fees and straining public treatment capacity. In fact, 1 gallon of wastewater per gallon of beer produced and about 70 percent of the water withdrawals from breweries end up as wastewater effluent. This effluent is high in biological oxygen demand, with rates that far exceed post-treatment limits—often resulting in significant treatment costs to the brewery and community-based treatment facilities. Suspended solids, such as yeast and hop wastes, can also end up as sludge in the wastewater treatment plan and result in additional disposal fees. During the fermentation process, each barrel of wort produced emits nearly 10 pounds of carbon dioxide. Breweries' water and energy consumption can also add up. Refrigeration, packaging, lighting, and compressed air use typically account for much of a brewery's electricity use; natural gas is used in the brewhouse, as well as for packaging and space heating. Breweries often rely on harsh cleaners, which can raise wastewater pH and end up down the drain, thus affecting a facility's ability to meet local or state water permits.

Even during challenging economic times, the brewing industry is a bright spot in American beverage manufacturing, with continued growth and an ingrained culture of sustainability. According to the National Beer Wholesalers Association, California, New York, Washington, Pennsylvania, and Colorado now each have more breweries than the entire country had in 1990. More than 70,000 Americans work for breweries and importers, and each job in the brewing industry generates about 30 more full-time jobs. However, along with the brewing industry's benefit to the economy can come sizeable environmental impacts. Implementing pollution prevention (P2) technologies and practices can help breweries reduce costs and lessen their effects on the environment, while differentiating their brands in the eyes of an environmentally conscious consumer base.

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The EPA P2 Program chose the American food and beverage manufacturing industry—which includes the brewing industry—as a National Emphasis Area (NEA) because of its potential to benefit the economy and achieve measurable environmental results. EPA is providing P2 grants to provide technical assistance to businesses within the NEAs to help them develop and adopt source reduction practices.

[For more information on EPA's P2 Grants Program, visit www.epa.gov/p2.](http://www.epa.gov/p2)

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### Brewery Operations Run Over with Clean Opportunities

**Investigate alternative cleaners.** Breweries commonly use caustic cleaners to sterilize their lines and remove scale from stainless steel brew kettles. [Merrimack Ales](#) demonstrated that brewers can use less powdered brewers wash (a cleaning agent popular with brewers) by substituting safer, less hazardous technology. This minor change saved \$3,000 annually and did not affect product quality.

**Evaluate brewing process byproducts.** The largest source of waste for most breweries is spent grains, accumulated from the brewing and lautering process. Many breweries, such as [Breckenridge Brewery](#) and [Left Hand Brewing](#) in Colorado, successfully repurpose spent grains and yeast as animal feed supplement for local dairy farms or as compost, and reuse yeast instead of buying new for each brew.

**Reduce wastewater treatment costs at the source.** Brewing is a water-intensive process. Implementing water conservation strategies can save money, use less water, and result in less wastewater to manage or treat. [Wild Wolf Brewing Company](#) in Nellysford, Virginia, removed the filtration step from its brewing process, reducing water use by 15,000 gallons per year as well as the number of times it would pay to pump out its brewery tank. [Blasty Bough Brewing Company](#) of Epsom, New Hampshire, used geothermal



