



Sustainable Breweries

Reduce pollution Minimize costs Increase efficiency

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Strategies that pay

Pollution prevention strategies at breweries not only benefit the environment but can also lead to greater efficiency and lower production costs. Increased brewing efficiency reduces water usage, energy usage, air pollution emissions and generated waste while simultaneously providing a return on the investment.

Reduction opportunities

Energy – Refrigeration creates the largest electrical load, while brewing consumes the largest amount of natural gas. Energy reduction efforts include:

- Install new seals, curtains, insulation & minimize the time the door is open to coolers.
- Install insulated heat and condensate recovery systems to recycle heat.
- Switch to efficient lighting and controls.
- Repair air and steam leaks.
- Maintain operational equipment regularly.
- Install variable speed motors in bottling operations.
- Reduce compressed air usage, use lowest possible pressure.
- Switch to on-demand/tankless hot water heater.

Air – Volatile organic compounds (VOCs) from fermentation and filling processes, and particulate matter (PM) from grain handling are the primary emissions from breweries. In addition, carbon dioxide (CO₂) is used and generated in the brewing process. Boilers burn natural gas and emit nitrogen oxide (NO_x). Examples of air pollution reduction efforts include:

- Install low NO_x burners on boilers.
- Install fabric filters to control PM emission from grain handling and drying.
- Reduce VOC emissions with carbon adsorption, incineration and wet scrubbing.
- Recapture CO₂ generated during the fermentation process and reuse in brewing.



FREE TECHNICAL ASSISTANCE

We can help with environmental compliance and reducing your business's environmental impact by providing free onsite assessments that can identify pollution prevention opportunities that have a return-on-investment such as water conservation, energy efficiency, reducing air emissions and waste reduction.

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Water – Brewing beer consumes 3 to 7 times the amount of water contained in beer, and approximately 70% of the water is discharged as wastewater. Wastewater pre-treatment may be required by the local municipality to remove organics/solids and adjust pH. Examples of water conservation efforts include:

- Install closed loop cooling systems for fermenters.
- Install a clean-in-place system (uses 60% less water).
- Reuse water where possible. Not all processes need clean water (irrigation, use final rinse water as pre-rinse water).
- Check for water leaks and have a maintenance plan.
- Install high efficiency spray nozzles for cleaning.
- Use dry cleaning methods (broom, wipe, rake, etc.).
- Install xeriscape landscaping and rain water catchment system.

Waste – Spent grains are byproducts of the malting and lautering processes and are the largest source of waste for most brewery operations. Packaging is the second largest waste stream for breweries. Examples of waste reduction efforts include:

- Conduct a waste audit to identify reduction opportunities and increase your landfill diversion rate. The goal is to reduce, reuse and recycle.
- Reuse spent grains and yeast as animal feed supplement.
- Compost spent grains.
- Save and reuse yeast to reduce the amount of new yeast that must be purchased.
- Seek light-weight, environmentally-friendly packaging made from recycled materials.
- Train personnel to better sort, stage and store materials; and greater recycling awareness.
- Consider onsite management strategies such as purchasing a cardboard baler, establishing a compost bin, or reusing wood pallets.

Benefits of Pollution Prevention

Improve profitability while minimizing environmental impacts. Create a company culture of sustainability by empowering all employees to drive sustainability into their daily activities and identify new opportunities for reduction.

- Reduce input costs and minimize natural resource usage.
- Reduce disposal costs and diminish my environmental footprint.
- Reduce environmental compliance costs.
- Reduce liability and provide a safe working environment.
- Reduce future growth obstacles.
- Attracts and retains the best employees.
- Establish brand identity and create value in the community.
- Attracts new business and enhances brand image.
- Helps sell more beer!