Fact Sheet

Energy & Resource Conservation for Breweries – Deschutes Brewery

State of Oregon
Department of
Environmental
Quality

Air Quality
Business Assistance
Program
811 SW 6th Avenue
Portland, OR 97204
Phone: (503) 229-5376
(800) 452-4011
Fax: (503) 229-5850
Contact: Rebecca Hillwig
www.oregon.gov/DEQ/

Background

Deschutes Brewery is a Bend, Oregon business making environmentally sound decisions as it grows. All decisions have a central theme − energy efficiency.

Deschutes Brewery Production Facility in Bend, OR

Energy-conserving warehouse and brew house

Cooling: The new 40,000-square-foot warehouse uses passive cooling to achieve 64° F year-round. This temperature is maintained even during the summer heat without using energy-consuming refrigeration or air conditioning—cool Central Oregon night air is trapped inside by concrete walls and exterior insulation, along with cold beer in the warehouse.

Process Heat: In the brew house, energy recovery reduces the need for steam. All of the heat for the brew house comes from steam supplied by two new, energy-efficient natural gas boilers. Heat lost from the boiling wort (unfermented beer) in the brew kettle is recovered and used to pre-heat future batches of wort with a *vapor condenser* on the exhaust stack. This translates into less energy demand, lower operational costs, and faster brew times!

Besides reducing energy demand, there is another benefit to energy recovery—steam from the kettle condenses into water. In this way, the vapor from the cooking beer stays in the brew house and the area outside of the brewery does not "smell like a brewery."

Energy-efficient boiler plant

Two new energy-efficient, *low nitrogen oxide (NOx) boilers* were installed to meet current and future steam demands. Both boilers have *stack economizers* that reclaim heat from the flue gas to preheat feed water for the boiler.

A *blow down economizer* was added to the boilers to reclaim heat from excess boiler water and is used to preheat feed water for the boiler. By preheating the makeup water, the Btu/hr input of the boiler drops while the Btu/hr output remains the same.

The condensate of oxygen on the boilers is scrubbed before it returns to the boiler by a *deaerator*. This decreases the amount of boiler blow down and decreases makeup water, improving energy efficiency and requiring fewer chemicals to treat the makeup water.

State-of-the-art Huppmann Brew House is energy efficient. With low-NOx burners, the boilers reduce air emissions.

Low nitrogen oxide (NO_x) burners reduce air pollution

Industrial boilers are a source of Nitrogen Oxide air pollution (NO_x). NO_x is a group of highly reactive gases that form smog, and can cause a wide variety of health problems from lung irritation to lowered resistance to viruses. Therefore, low nitrogen oxide burners are important for reducing harmful NO_x emissions.

The Brewery's construction took place in the fall and winter. During that time, the new boilers and brewing facility operated without a roof or walls. The cold weather and exposed machinery caused the Brewery to use approximately 15% more natural gas to make each barrel of beer produced during this period. **Despite the 15% increase in fuel usage during the construction period, the efficiency of the low NO_x burners still reduced NO_x emissions by 54%.**

Last Updated: 10/10/11
By: Rebecca Hillwig
DEQ 04-AQ-004

Pollution prevention in the office

Energy conservation didn't stop with the warehouse, boiler plant and brew house. In the office, several conservation measures were put into place such as:

- Sending and receiving double-sided faxes
- Printing double-sided on in-house print jobs
- Printing fewer e-mails
- Reusing trash liners
- Reusing file folders
- Providing permanent-ware plates and glasses for break areas (in lieu of disposables)
- Purchasing recycled-content paper and recycled toner-cartridges through a local recycled products purchasing cooperative.

Restaurant resource efficiencies

An evaluation of the brewery restaurant and public house looked specifically at how water, materials, and energy were being used and consumed. By applying measures to reduce resource use and consumption, the restaurant not only limited the amount of pollution and waste generated, but also realized significant energy savings. This increase in resource efficiency saved the organization about $5,900 each month. Some examples are:

- Installing a kitchen dishwasher that operates on 1.4 gallons of water per cycle compared to the old dishwasher, which used 5 gallons per cycle, to save $3,500 a year.
- Purchasing unbleached "to go" containers that prevents chlorine-intensive bleaching chemicals from entering the environment.
- Encouraging customers to view the brewery's newsletter, The Bitter Truth, on line instead of reading the printed version, to save paper.
- Making energy-saving decisions such as: replacing older thermostats; installing an insulated exterior door to the cooler; installing a more efficient ice machine; using compact fluorescent bulbs; placing lights on dimmers; and keeping fans, lights and televisions off until customers arrive—all of which saves about 3000 kilowatts per month for a $200/month savings on electric bills.

More information

To learn more about the changes implemented at the Deschutes Brewery, Contact them at 541-385-8606, or visit the brewery's website: Deschutes Brewery

To learn about ways to use and conserve resources more efficiently, visit the DEQ website: Beyond the Bin

To learn how your facility can become more energy efficient, contact the Oregon Department of Energy toll-free in Oregon at 1-80-221-8035 or visit their website: http://www.oregon.gov/ENERGY/

To contact DEQ's Air Quality Business Assistance Program, call 503-229-5376, or visit our website: www.deq.state.or.us/aq/bap.

Alternative formats

Alternative formats of this document can be made available. Contact DEQ's Office of Communications & Outreach in Portland at 503-229-5696 (toll-free in Oregon at 1-800-452-4011) for more information.