



## Great taste, less (land)filling

### For two Colorado breweries, reducing waste leads to a better business and better beer

More and more breweries are looking for ways to improve their bottom line through reduced operational costs, improved processes, company differentiation and improved customer relations while maintaining a sustainable brewing process. Colorado is home to more than 300 breweries that have a statewide economic impact of more than \$1 billion. Considering the sheer number of breweries, especially small ones such as microbreweries and brewpubs, and their aggregated economic contribution, there is significant opportunity to test and develop best practices.

Fortunately, most brewers tend to be nimble and innovative and are not afraid to try new things in the hopes of better beer and a better business. Two of Colorado's leading breweries, Left Hand Brewing Company and Broken Compass Brewing, have seen their businesses improve through pollution prevention "P2" techniques that reduce waste and increase efficiencies.

#### Left Hand's P2 practices improve bottom line

Those of us who live in Colorado know Left Hand as a premier brewery located along the banks of the St. Vrain River. With a passion for the environment, Left Hand President and cofounder Eric Wallace has created a sustainability committee. Members from each brewery department brainstorm ways the business can become more sustainable.

Left Hand has increased landfill diversion and recycling using waste audits, signage and waste reduction

campaigns. As with most breweries, spent grain is collected by cattle ranchers to be used as feed. They also divert sweet water<sup>1</sup> from the local wastewater treatment plant and give it to cattle ranchers.

While Left Hand focuses much of its efforts on waste reduction, energy efficiency and water conservation are also key to Left Hand's pollution prevention successes. Left Hand has added a Braukon Kettle<sup>2</sup> to operations, reducing natural gas use by half. They also have installed a 4.8 kilowatt solar photovoltaic system to offset grid-supplied electricity. To reduce water consumption, Left Hand uses a clean-in-place system<sup>3</sup> and water-efficient brewing equipment.

While a majority of efficiencies result from equipment and process changes, Left Hand has been successful engaging staff in its efforts. Employees were particularly motivated by their peers and management: When they saw the the president involved, and the work of the sustainability committee, they were more willing to engage in sustainable activities.

Currently, Left Hand uses 28 kilowatt-hours and 3.92 gallons of water per barrel of beer produced and diverts 99 percent of waste from the landfill. They have also received zero waste certification from Boulder County's Partners for a Clean Environment program.

#### Broken Compass' vision: Most sustainable brewery in the world

Broken Compass is a true microbrewery pub, located in the heart of Breckenridge. When David Axelrod helped co-found Broken Compass, he looked at his business and building holistically, from a systems perspective -- everything that happened in his business, including the brewing process and operations, is connected. From the beginning, the brewery tapped local resources:

## Top P2 practices

- Lead with green teams and engage staff.
- Conduct waste and energy audits.
- Track key performance indicators and set goals.
- Use local and sustainable sourced materials.
- Recycle and repurpose waste products.
- Actively support responsible farming practices.
- Use energy efficient equipment.
- Approach systems holistically.
- Optimize and clean heating and cooling systems.
- Use heat recovery units on boilers, micro-turbines, and brew kettles.
- Install CO2 recovery systems.
- Use alternative transportation for delivery trucks.
- Consider renewable energy systems.
- Publicize successes.

beetle-kill wood is used in their taproom, corrugated metal is used on walls, and local products were used to create the initial space. Broken Compass addresses all potential sources of waste and uncovers innovative ways to improve efficiency such as installing light-emitting diodes (LED) throughout the brewery. It gives spent grain to local buffalo ranchers and uses waste heat.

Capturing and using waste heated to one of the company's biggest savings. While a glycol chiller would normally be located outside, Broken Compass placed

theirs inside. As the chiller cools the beer, it releases heat, which is used to heat the brewery. Likewise, in the taproom Broken Compass uses industrial fans to blow waste heat from its walk-in cooler compressors to heat the space.

Rather than using a glycol chiller to chill wort, Broken Compass uses tap water. Once the tap water leaves the system at 120 degrees to 150 degrees Fahrenheit, Broken Compass can reuse this water to preheat the new brew, clean tanks and in any other application that requires hot water.

Broken Compass' sustainability practices provide a host of ancillary benefits: glycol chiller placement saved on upfront costs, sustainability commitments have improved word-of-mouth and reduced marketing costs, and its strong commitment to pollution prevention has helped strengthen its relationship with the community.

<sup>1</sup> Sugary wastewater product.

<sup>2</sup> A sophisticated boiling system for boiling wort.

<sup>3</sup> A way to clean the interior of pipes, vessels, and other equipment without disassembly.



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