



Pollution Prevention Case Study: Philipsburg Brewing Company

Company Profile:

PHILIPSBURG
BREWING CO.
M O N T A N A

Philipsburg Brewing Company, located in the historic town of Philipsburg, Montana, is a community-centered craft brewery committed to quality, sustainability, and local impact. Known for its unique craft beers and spring water, Philipsburg Brewing has built a reputation that extends beyond its award-winning brews, embracing values that enrich both its community and the environment. Philipsburg sources local ingredients whenever possible, supports local agriculture, and invests in environmentally friendly practices across its production processes. Through innovative waste reduction, energy-saving initiatives, and a dedication to reducing its carbon footprint, the brewery not only prioritizes sustainability but also fosters a deep connection with its patrons and the surrounding community.

Solutions

During my internship at Philipsburg Brewing Company, supported by the Montana Pollution Prevention Program and the Environmental Protection Agency (EPA), I was tasked with developing sustainable practices aimed at reducing the environmental footprint of the brewery's operations. Philipsburg Brewing Company is deeply committed to its community and to advancing its environmental stewardship efforts. My primary focus areas included evaluating wastewater and carbon management, assessing energy efficiency opportunities, and identifying waste reduction strategies within the brewing process. This work was aligned with the brewery's overarching sustainability goals, which seek not only to minimize environmental impact but also to build a resilient, self-sustaining business model..

Another key project involved evaluating the feasibility of a carbon dioxide (CO₂) reclamation system. CO₂ is both a byproduct of fermentation and an essential input for various stages of brewing, so reclaiming it could present significant economic and environmental benefits. By capturing, purifying, and reusing CO₂ emissions, the brewery can reduce its dependency on external suppliers, decrease its carbon footprint, and potentially enhance the quality of its

products. After reviewing available technologies, we recommended the CiCi Oak model from Chart Industries, a system that promises a 4-5 year return on investment. This biogenic carbon capture process not only minimizes emissions but also offers an environmentally favorable solution by enhancing nutrient cycling within ecosystems. However, to fully evaluate the long-term benefits, we advised implementing an initial CO₂ usage and emissions assessment and seeking ongoing consultation from the equipment manufacturer.

Additionally, I reviewed various energy efficiency measures and waste reduction initiatives. For instance, I identified an opportunity to replace the brewery’s outdated centrifugal pump and motor, which would save approximately 1.2 metric tons of CO₂ per year. Further steps to enhance efficiency included switching to motion-censored LED lighting, optimizing aluminum and cardboard packaging, and redirecting spent grain to local livestock as feed. Together, these actions not only reduce environmental impact but also yield cost savings, supporting the brewery’s financial sustainability while minimizing waste generation.

Based on these findings, I recommend a phased approach for Philipsburg Brewing Company.

In addition to the key sustainability initiatives related to wastewater, CO₂ reclamation, and energy efficiency, I also explored improvements in waste reduction through a cost-effective bottle-catching system. Philipsburg Brewing Company, which handles approximately 70,000 bottles annually, implemented a low-cost solution involving a simple sewing kit and Velcro to capture and redirect bottles more efficiently in the production line. This adjustment not only minimized waste but also saved the company an estimated \$35,000 in annual costs related to bottle loss. This practical solution reflects the brewery's innovative approach to reducing environmental impact and operational costs through simple yet effective strategies. By implementing this bottle-catching system alongside other initiatives, Philipsburg Brewing continues to demonstrate its commitment to both environmental and economic sustainability, showing that even small adjustments can lead to significant savings and improvements in efficiency.

Recommended P2 Actions	If Implemented:								If Not Implemented:	
	\$		Annual Reductions						Barrier to Implement	Plans to Implement within 5 years? (pick Y/N)
	One-time Cost to Implement (\$)	Annual Savings from P2 Action (\$)	Hazardous Material input (lbs)	Hazardous waste (lbs)	Air emissions (lbs)	Water pollution (lbs)	MTCO ₂ e emissions (tons)	Water use (gal.)		
New Centrifugal Pump & Motor	\$1,131.20	\$234.51	-	-	-	-	1.2	738	-	Y
Carbon Recapture System	\$126,630	TBD	-	-	-	-	TBD	TBD	Cost & it's a newer company	Y

Table 1. Recommended actions with reduction and cost analysis