

Craft Brewery Sustainability

Michelle Stockness, PE, ENV SP
Barr Engineering Co.

Brewery Sustainability

Generally, craft breweries in Minnesota seem enthusiastic about incorporating sustainability principles



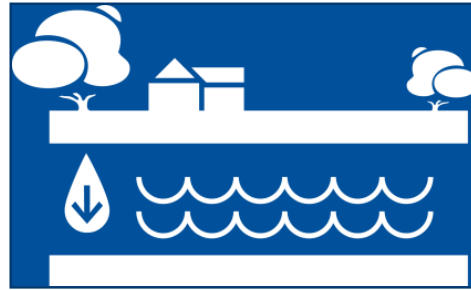
Now: how to accomplish these ideas?

What is
sustainability
in a
brewery?

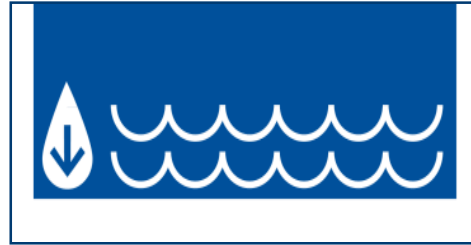
- Energy efficiency
- Solid waste reduction
- **Water efficiency**



Drivers



source water
availability



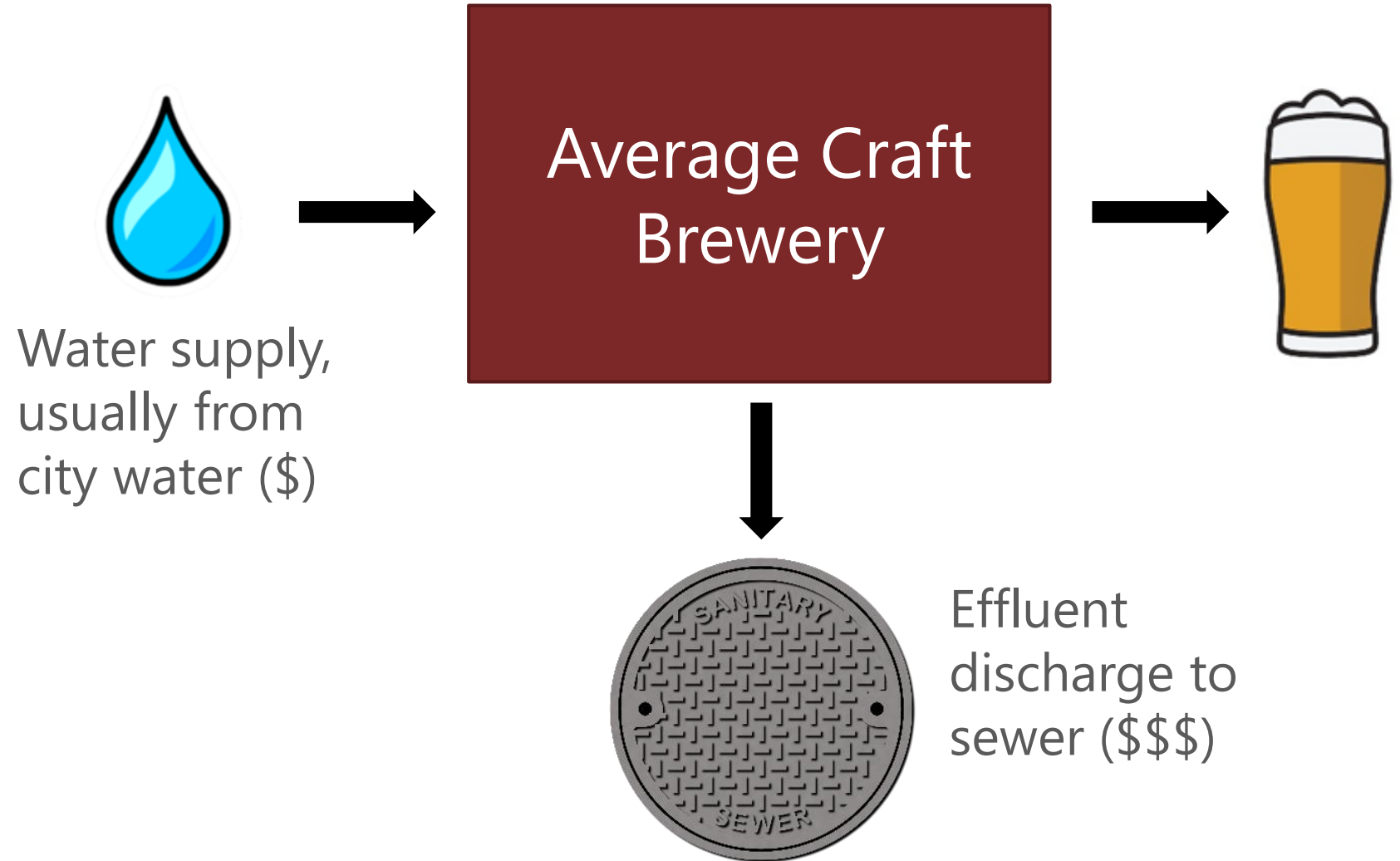
discharge
requirements



changing
regulations

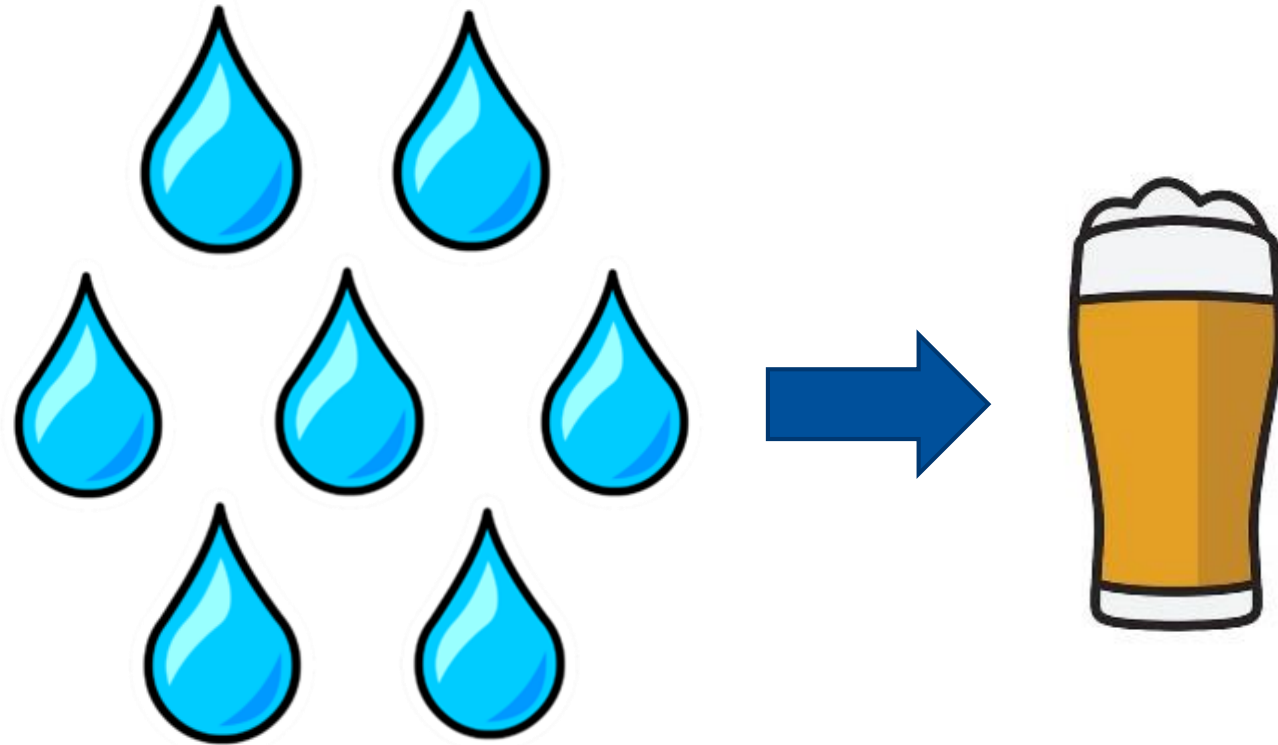
- cost of water supply or discharge
- corporate sustainability goals
- public education

Water Balance



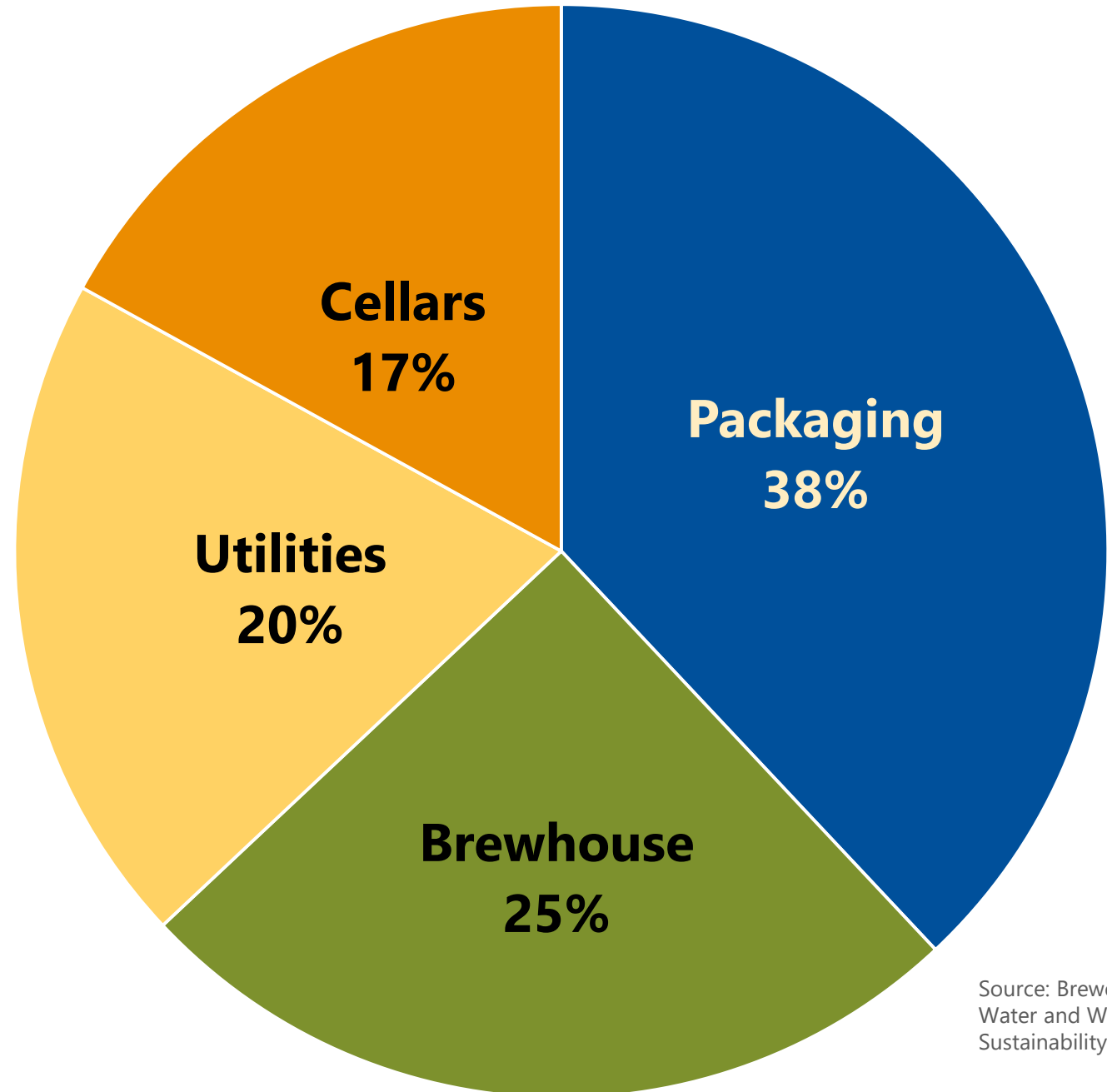
Water Efficiency

Average = **7 gallons** of water: **1 gallon** of beer



Best = **3 gallons** of water: **1 gallon** of beer

Average Brewery Water Use



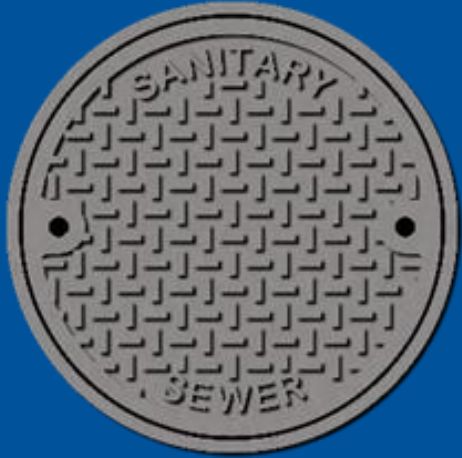
Source: Brewers Association
Water and Wastewater
Sustainability Manual

Water Efficiency and Reuse Ideas



- 💧 Determine minimum water use and pressure per unit operation
- 💧 Leak detection
- 💧 Rainwater harvesting
- 💧 Water reuse for rinsing, packaging, washdown, cleaning, cooling towers
- 💧 Automated valves to avoid over supply
- 💧 Non-water removal of solids (brush, rake)
- 💧 Water efficient process equipment
- 💧 Gray water, stormwater reuse for irrigation

Wastewater Pretreatment



- Advanced filtration
- Advanced solids dewatering
- Storage to equalize peak volume or strength
- Online instrumentation
- Separation of different wastewaters to tailored onsite treatment

Common Barriers



- ☹️ Staff time
- ☹️ Funding
- ☹️ Need more data
- ☹️ Business case: Water is cheap!
- ☹️ Variability of discharge water quality

Potential
solutions to
move
forward



- 👍 Funding
- 👍 Sharing of best practices
- 👍 Collaboration between smaller breweries
- 👍 Partnerships with organizations that share common sustainability goals
- 👍 Regulatory programs or permits that incentivize sustainability

What guidance is available?



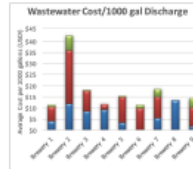
Wastewater Management



Getting Started:



2: Is that a lot?



What is our vision of a sustainable brewer?

- Produces the highest quality beer while minimizing impacts to the environment
- Balances profitability with the needs of the planet, our workforce and communities
- Protects the environment for brewing ingredients and future generations
- Sources, builds, and operates responsibly, without compromise
- Uses natural resources in an efficient manner and strives to eliminate waste

A Wastewater Champion:

- Challenges status quo and looks for ways to reuse and recycle wastewater
- Creates and encourages a vision of water efficiency
- Engages employees and communities to be part of the solution
- Designs and constructs to reduce costs

Where do I look for

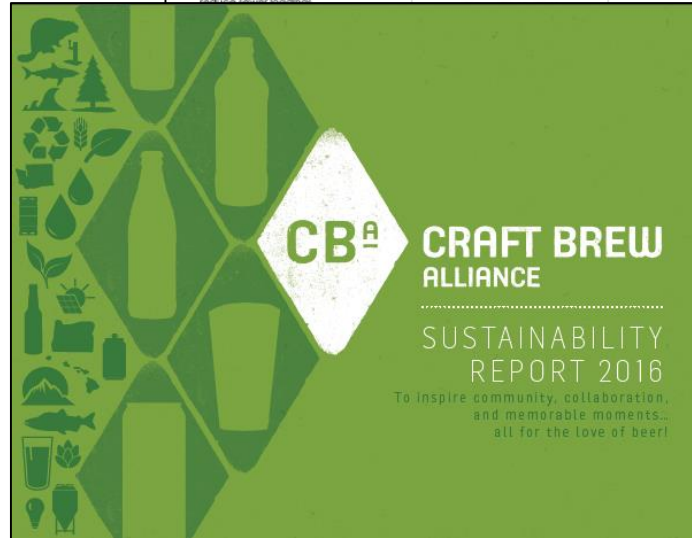
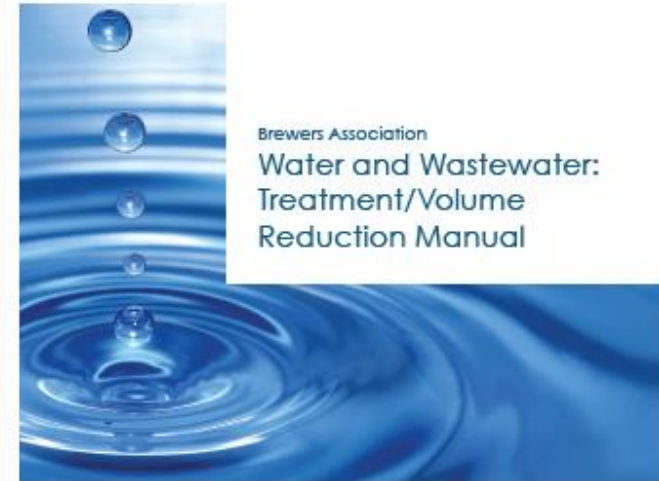
- Water going down drain, especially
- Hot break trub fin cleanings and rinses
- Weak wort from extractions
- Cold break trub cleanings and rinses
- Spent yeast from fermentation tanks
- See BA [Wastewater Sustainability Manual](#) for other ideas

How can I reduce

- Normalize water cost to bbls produced
- Compare to Sust Benchmarking Report
- Set targets for most best in class peers
- Use BA [Wastewater Sustainability Manual](#) to develop a plan
- Get employees excited
- Review progress regularly and adjust

How do I Learn More

Click on the link to access the manual here!



Thank you!

Cheers!

