

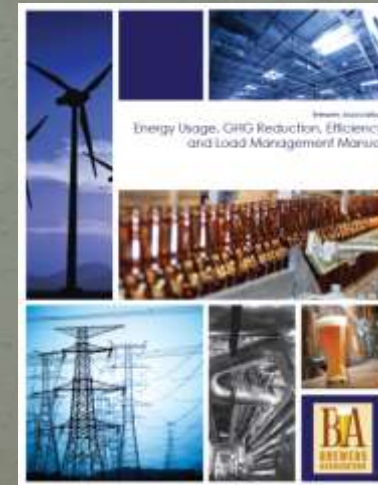
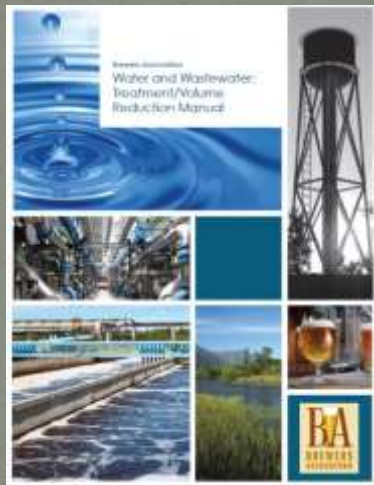


Sustainably Brewing at Odell

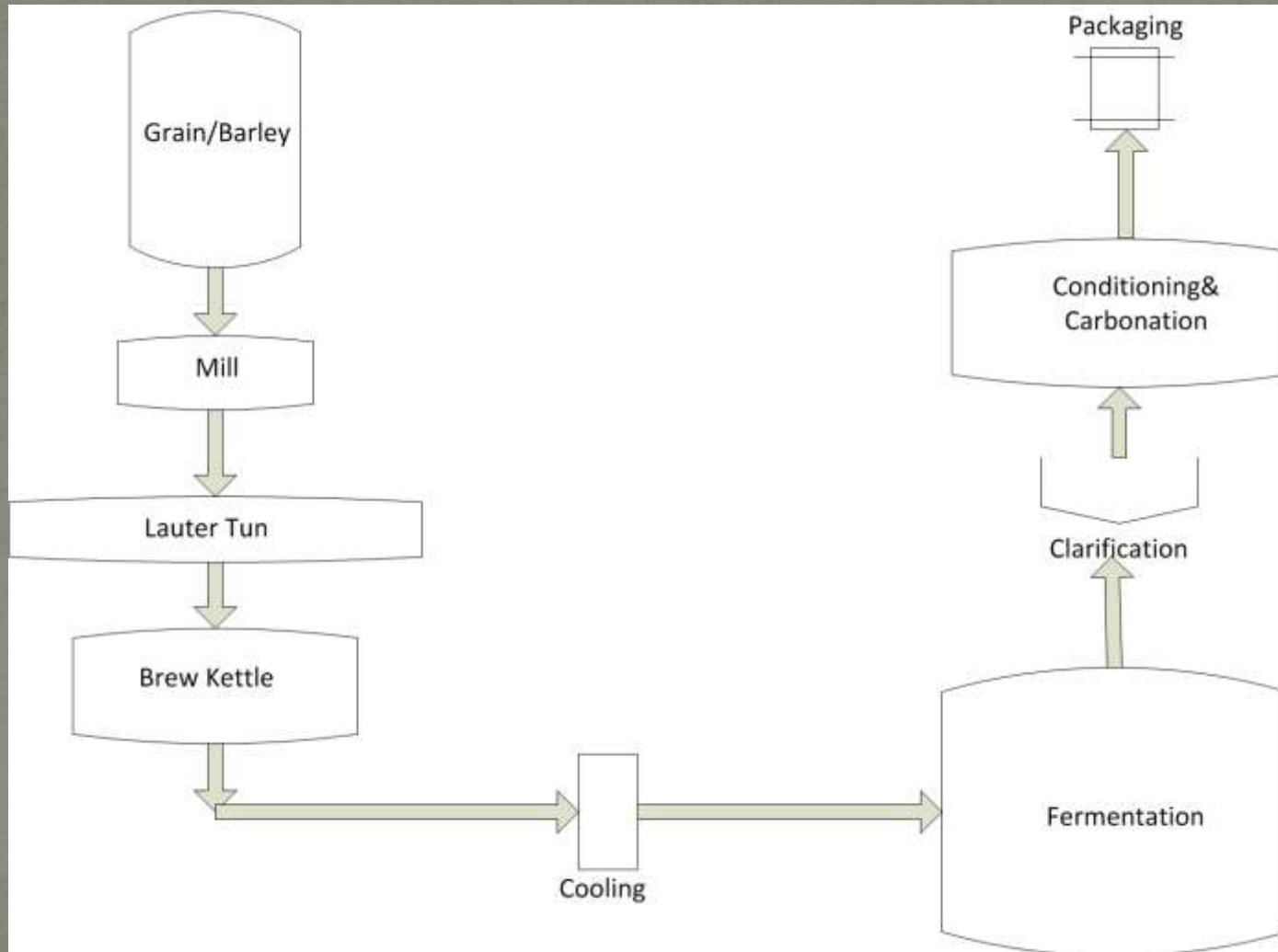
Matt Bailey
Sustainability Coordinator

Brewing responsibly

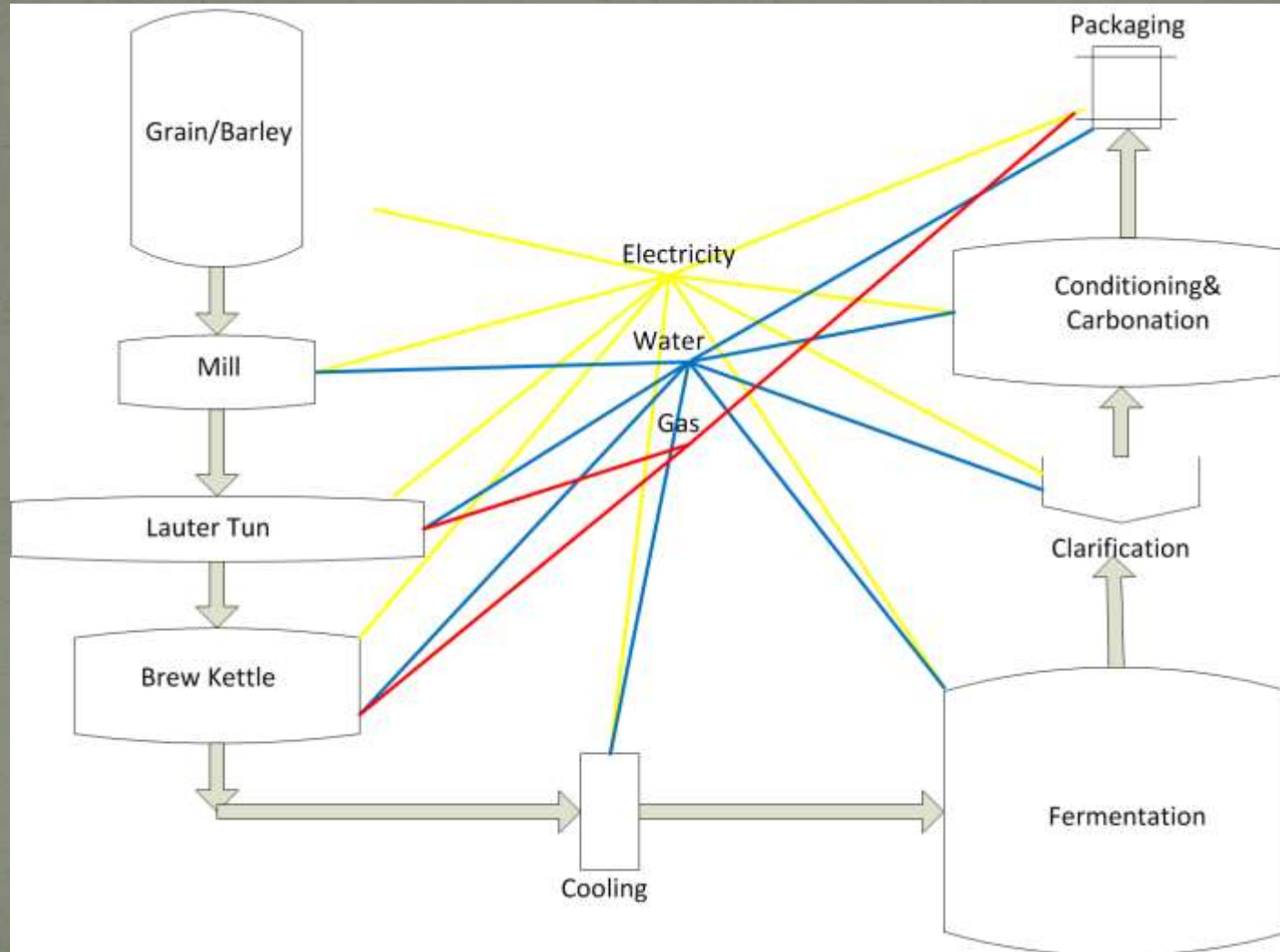
- Brewing is energy, water, and natural resource intense process
- White papers and Panel discussions prevalent at Brewing conferences
- Brewers Association Sustainability manuals
 - Available for non-members – www.brewersassociation.org



Brewing 101



Brewing 101



Malt Handling



- Motor reduction
 - Let gravity do the work

Brewhouse



- Brewing Vessel Insulation
 - Keeps heat in = reduction of Heating and Air Conditioning demand in room
- Windows
 - Natural light in Cellar and Brewhouse

Brewhouse



- Brew kettle Vapor Condenser
 - Heats Hot water in brewhouse to 190 deg F

Brewhouse

- High Efficiency Boiler
 - Boiler Economizer
 - Captures heat from exhaust and pre-heats feed water
 - Internal Brew kettle colandria
 - Internal heat exchanger
 - Reduces boil time and gas usage

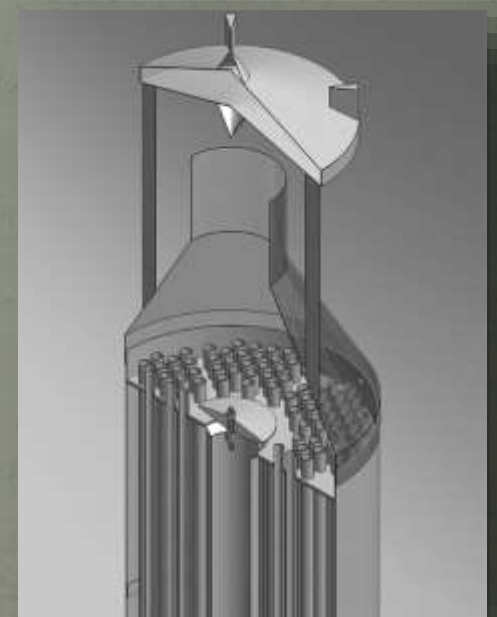
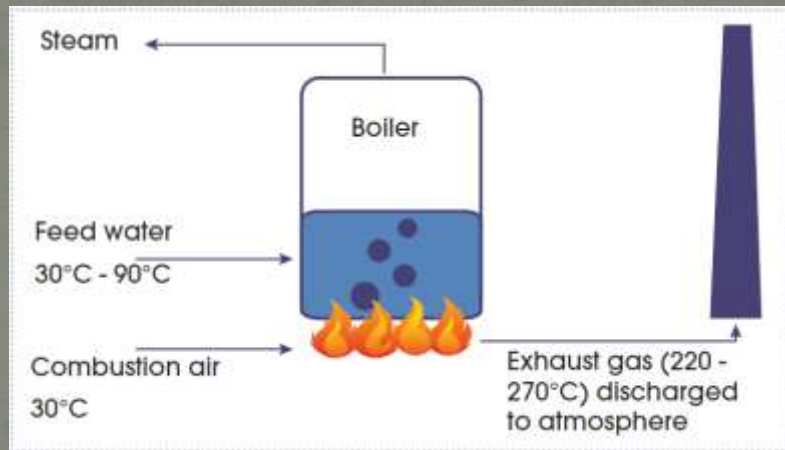


Image from Energy Usage Manual, Brewers Association (2013)

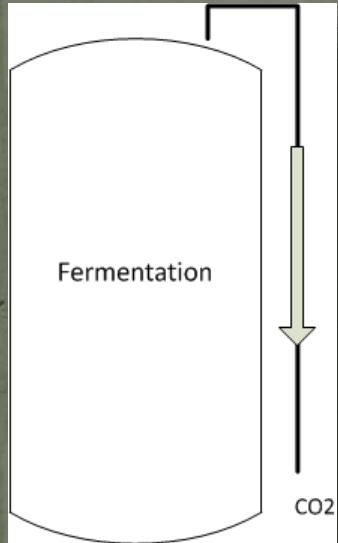
Brewhouse



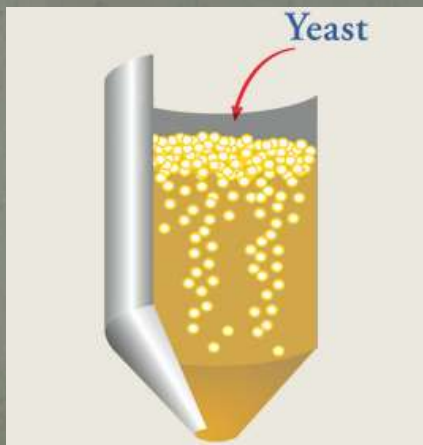
- External heat exchangers – CIP (Clean in Place), Cold and Hot Liquor tanks
 - Same concept as tankless water heaters
- Hot Water capture
 - Generated from wort cooling



Cellar/Fermentation



- Hot Water Sanitization
- Turn off Cone during active fermentation (50-70 deg F)
 - Promotes natural convection
- Balance CO₂ pressure between tanks during beer transfer
 - Investigating CO₂ recovery
- Electric valves vs. pneumatic valves for temperature control



Packaging

- Re-designed Bottle Line Vacuum pump
 - Water used three times
- 3.7 gallons/gallon packaged
 - 14% reduction in 2012 or 1,321,000 gallons saved



Hop Cooler and Beer Cooler



- Outside air cooling of Storage coolers
 - Compressors shut down when outside temps drop below 47°
- Solatubes for natural lighting

Electricity Reduction

- Photovoltaic Array
 - About 11,000 sq ft of rooftop 200-watt panels
 - 76.8 kilowatts of electric capacity
- Wind Power
 - Provides remainder of electrical need (100% since 2001)



Project Hurdles

- Money
 - Cost for oversized units
 - Not modular
- People
 - Wearing too many hats or stretched too thin
 - Experience
- Time
 - Often new equipment trumps improvement
 - Data required for ROI calculation

Odell Brewing Sustainability

- Brewing process use many natural resources to make beer
 - Need to be responsible and always look for improvement to use areas
- Important to take a “never satisfied” approach to conservation...there is always ways to improve

Thank you...Questions?

