MILLERCOORS’ GOALS FOR WATER SAVINGS AND APPROACH TO WATER REDUCTION

JULIE SMITH, PE, OPTIMIZATION ENGINEER
Brewery Water Reduction - Overview

- Corporate Goals and Score Carding
- Water Usage in the Brewery
  - Processes
  - Value
- Evolution of Water Reduction
- 2013 Water Reduction Projects
- Water Re-Use
- Results
- Conclusions
Corporate Sustainability Goals

- Energy Usage of 120 MJ/HL by 2015
  - Electricity
  - Steam
  - Vehicle Fuel
- Water Usage of 3.18 HL/HL by 2012
- Zero Waste to Landfill by 2015
- CO₂ Self-Sufficiency of 85% by 2015
- 50% Reduction in Green House Gas by 2020

BHAG – 4th Brewery or Better in MillerCoors
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**Monthly Indicator**

- **High Usage**
- **Typical Usage**
- **Reduced Usage**

**Monthly/YTD/Budget KPI**

- Above Upper Target
- Between Stretch & Upper Target
- Stretch Reduction

**EWER - People/ Process & Technology**

- <60%
- 60-80%
- >80%
Brewery Process Overview

- Malting
- Brewing
- Fermenting
- Conditioning
- Packaging
- Warehousing
Brewery Water Value

- Value of Water
  - Temperature
  - Treatment
  - Chemicals

- Beer!
- Condensate – Hot/RO
- Hot CIP water
- Ambient water – A Water, B Water
- Chemicals
- Cooling Water
- Wastewater
- “Clean” Wastewater

High $ → Low $
Evolution of Water Reduction

Where do we Start??

I. Stop the Bleeding
   - Leaks
   - Turn it off

II. Process Changes
    - Simple
    - Complex

III. Focus on Energy
     - Water Will Follow

IV. Capital Projects
    - Metering
    - CO2 Scrubber
    - Condensate/Flash Steam Recovery

V. Water Re-Use
Savings Opportunities – Water and Wastewater

Golden Brewery Total Water Usage 2014 vs 2013

Flow Rate, gal/day

22-Nov-13 11-Jan-14 02-Mar-14 21-Apr-14 10-Jun-14 30-Jul-14 18-Sep-14 07-Nov-14 27-Dec-14
Savings Opportunities – Water and Wastewater

PACKAGING SEWER LINE FLOW RATES

FLOW RATE, gal/min

Nov-11 Dec-11 Feb-12 Apr-12 May-12 Jul-12 Aug-12 Oct-12 Dec-12 Jan-13 Mar-13

East Line
West Line
WH3
WH1
TOTAL
Golden Brewery Water Reduction - 2013

- Reduce Kettle Evaporation – 0.03 HL/HL
- Packaging Shut off B Water to Full Can Rinser – 0.023 HL/HL
- C14 Fire Pump Seal Water Leak Repair – 0.02 HL/HL
- Aging Recovery of CIP Rinse – 0.015 HL/HL
- Brewing Shut off Dead Leg Bleeders DA Manifold – 0.004 HL/HL
- UOPS Correct Condensate Leak to GBL – 0.015 HL/HL
- Prevent Hot A Water Overflow – 0.11 HL/HL
- 4-Can Condensate Recovery – 0.001 HL/HL
- Facilities Turf Reduction Water Savings – 0.006 HL/HL
- Facilities Evaporative Cooling Reduction – 0.023 HL/HL
- Brewing FIT Water Savings – 0.059 HL/HL
- PWTP Waterless Dechlorination – 0.003 HL/HL
- C12 Hot Water Heater for Liquid Adjunct Pump – 0.016 HL/HL
- UOPS B1 Cooling Water Evap Reduction – 0.044 HL/HL
- C11 Cold Sanitization – 0.011 HL/HL
- YDP CIP Re-Use of Still Bottoms – 0.005 HL/HL
- Packaging Vacuum Pump Seal Water Reclalm – 0.005 HL/HL
- Gov Cellar – re-use sanitization water for flushing tanks and headers – 0.00057 HL/HL
- Brewing Hot Water Cycle Time Reduction – 0.025 HL/HL
- Brewing Reduce Wort Cooler CIP Flush Rates – 0.0028 HL/HL
- 7-Bottle Warmer Reduced Water Changes – 0.0005 HL/HL
- Fermenting CIP Pulse Cleaning – 0.024 HL/HL
- YDP B-Water Overflow Valve Corrected – 0.019 HL/HL
- C12 Basement Hot Water Heater Replacement – 0.01 HL/HL
- UOPS C1 Cooling Tower Evap Reduction – 0.15 HL/HL

1 HL/HL = 300 MG/Year
600 gpm
Water Re-Use/Recovery Considerations

• Food Plant Hygiene
• Simple Projects First
• “Clean” Re-Use First
• Look for “Dirty” Sinks
• Distance to Process
• Cooling Water
• Consider Energy
Water Re-Use/Recovery

- YDP use of still bottoms
- Liquid Adjunct Pump Recirculation
- Vac Pump seal water recirc
- CIP Pre-rinse
- Packaging Reclaim Cascade
- CO2 Scrubber Water – Re-Use for Regen Steam Cooling Water
Water Re-Use/Recovery

Packaging Cascade

Empty Can/Bottle Rinser

Full Bottle Rinser
Seal Water or Warmers

Can Crusher

Sewer

Clean Use

Dirty Use

Can crusher Dirty Use

Clean Use
Water Re-Use/Recovery

Packaging Water - Warmers - 2014

Water Usage, gal/day

- Warmers B-Water
- Warmers Recycled Water
Water Re-Use/Recovery

CO2 Scrubber Cooling Water

Chilled Water

Scrubbers

Condenser

Steam Out

Carbon Towers

Steam In

Sewer
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Conclusions

1. Leadership
2. Scorecarding
3. Shared Learnings
4. Start Simple – Build Momentum
5. Process Changes
   • Minimum Cost
   • High Impact
6. Capital Projects
   • High Cost
   • Impact Depends on Culture
“NEVER DOUBT THAT A SMALL GROUP OF THOUGHTFUL, COMMITTED PEOPLE CAN CHANGE THE WORLD. INDEED, IT IS THE ONLY THING THAT EVER HAS.”

Margaret Mead