CA CRAFT BEER SUMMIT 2019

CALIFORNIA CRAFT BREWERS ASSOCIATION CCBA 30th ANNIVERSARY

Break Down Your Barriers to Brewery Sustainability

California Craft Brewers Association
Craft Beer Summit 2019

September 12, 2019

Presented By

John Stier

Brewers Association Sustainability Mentor

What's On Tap?

- Introduction
- What is sustainability?
- Benefits
- Barriers
- Breaking Down Barriers
- Resources Available
- Q&A

Who Is This Guy?

- Thirty years at Anheuser-Busch: Senior Director Global Sustainability
- Seven years global food and beverage sustainability leader within Antea Group: Coca-Cola, Heineken, Diageo, Beam Global Spirits and Brown Forman
- Four years at Brewers Association: Sustainability Mentor

Sustainability Mentor

- Primary author of the Sustainability Best Practices and Benchmarking Reports
- Keeper of the Sustainability Benchmarking Tools
- Technical Hot Line to assist Brewer Association members brew more sustainably

INDUSTRY UPDATES

BREWERS ASSOCIATION ANNOUNCES NEW SUSTAINABILITY MENTOR

October 19, 2016

The Brewers Association (BA) is pleased to announce the appointment of industry expert John Stier to the newly created position of sustainability mentor.

In his role, Stier will spearhead the BA Benchmarking Project. His responsibilities will include soliciting data collection for the annual BA Benchmarking Report, data verification and input in developing the report. Most importantly, Stier will assist BA members as they learn to utilize the new BA Benchmarking Tools. The Benchmarking Tools include iEHS Mobile Metrics, software that allows data input from both a desk top computer and mobile device, and the Sustainability Dashboard, interactive software that allows brewers to track energy and water use as well as compare their performance to other breweries with similar annual production. In addition, Stier will help BA members to identify simple, quick and sustainable return-on-investment projects in their breweries.

Stier has over three decades of experience in the brewing sector, including time spent leading the global sustainability efforts for Anheuser-Busch (AB). Since leaving AB in 2008, Stier has worked with a number of leading global beverage companies to develop sustainability strategies and implementation plans that create measurable business value. He has been active with the Brewers Association over the last three years as a member of the BA sustainability subcommittee and is the primary author of the BA Sustainability Manuals.

Sustainability Ambassador

- Engage state brewer guilds
- Increase participation in the Sustainability Benchmarking Project
- Advocate for the Sustainability Manuals and Tools

BREWERS ASSOCIATION ANNOUNCES NEW SUSTAINABILITY AMBASSADOR MATT GACIOCH

February 28, 2019

The Brewers Association (BA) has announced that Matt Gacioch will fill the position of Sustainability Ambassador, replacing former ambassador Ian Hughes. Gacioch will work in conjunction with Quality Ambassador Neil Witte and Safety Ambassador Matt Stinchfield to bring attention to BA resources in their areas of expertise.

Sustainability Ambassador

As Sustainability Ambassador, Gacioch will promote the mission of the BA Sustainability Subcommittee to "help current members and future generations to brew the highest quality beers in a manner that strengthens the value of their businesses, increases the resiliency of the natural environment and agricultural systems that provide brewing ingredients, and enhances the lives of our workforce and their communities."

> "The same way that the craft beer industry has reinvented the role of beer in society, it has the incredible opportunity to help reinvent the role of business in creating a positive impact," said Gacioch. "It's a great honor to join the Brewers Association and its members to help create a new model for our common future!"

Gacioch has spent his career exploring the nuance and opportunity of sustainability within the craft beer industry, the built environment, and communities around the world. As the former Director of Sustainability and Marketing for Short's Brewing Company in Michigan, he created programs and executed sustainable design initiatives on energy, water, and waste, all while working to tell an authentic story of successes and (plenty of) road bumps. He has also worked in sustainability at Left Hand Brewing Company and in the Craft Beer Program at the Brewers Association. He holds an MBA in Strategy & Finance, an MS in Environmental Policy & Planning, and a BS in Environmental Science, all from the University of Michigan. In his day job at stok, an integrated real estate services firm that provides sustainable design and engineering services, he explores business cases and develops strategies for sustainability and wellness in commercial real estate.

Sustainability Subcommittee

BREWERS ASSOCIATION
POWER HOUR

brewers association
CRAFT BREWERS conference
& BrewExpo America®

CERTIFIED BREWERS ASSOCIATION INDEPENDENT CRAFT

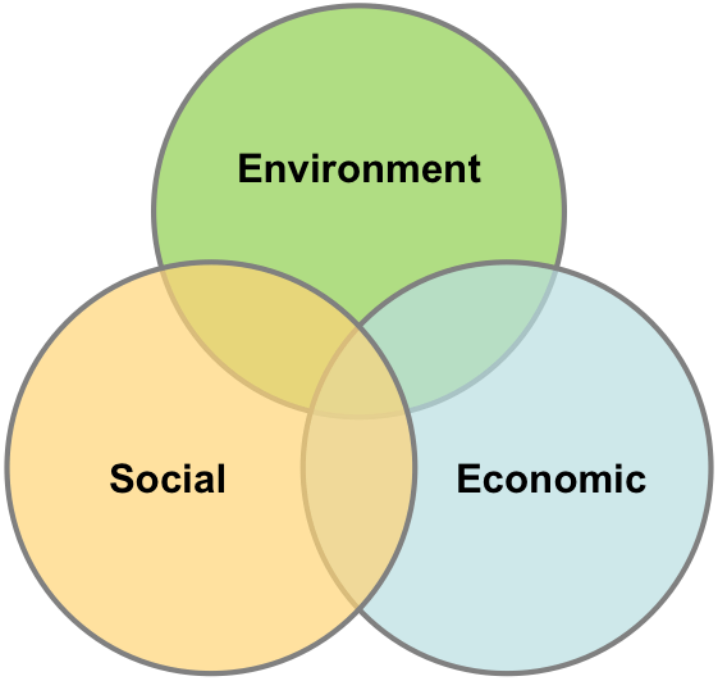
BA BREWERS ASSOCIATION


What Is
Sustainable
Brewing?

Defining Sustainability

“Meeting the needs of the present without compromising the ability of future generations to meet their own needs.”

-Our Common Future Report, 1987



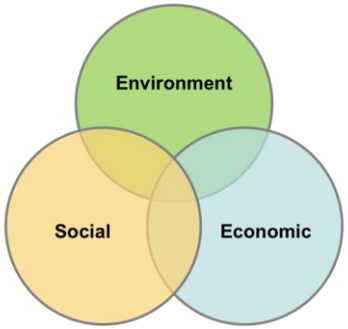
The Perfect Pint

How can I produce the highest quality beers in a profitable manner that also:

- Minimizes natural resource usage
- Lessens my environmental footprint
- Provides a safe working environment
- Attracts and retains the best employees
- Creates value in the community
- Protects my supply chain ingredients
- Enhances my image as a responsible brewer
- Helps me sell more beer
- Other?

Benefits

Economic Benefits



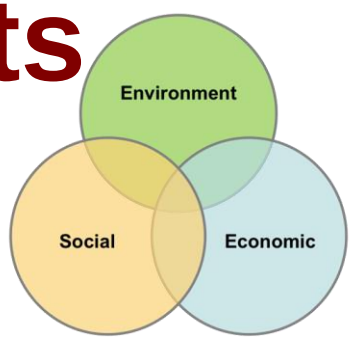
$$\text{Profitability} = \frac{\text{Revenue} - \text{Cost of Goods Sold}}{\text{Revenue}}$$

Cost of Goods Sold = Raw Materials + Labor + Overhead

Overhead is the ancillary items that are needed to produce beer (utilities, rent, maintenance, materials, waste, etc)

Increased efficiencies + ***Reduced Business Disruption Risks*** + ***Enhanced Brand Image*** → ***Long Term Profitability***

Environmental Benefits



Climate Change

CO_2 is one of several man-made greenhouse gases that trap heat in the atmosphere and is suspected of contributing to adverse climate change.

Water Availability

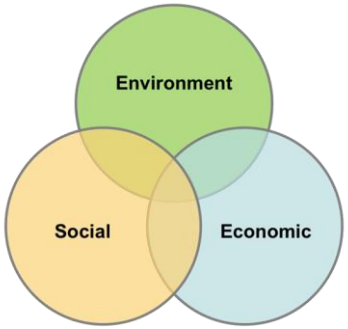
The severity and frequency of drought is increasing in the U.S. and lakes/streams continue to battle water pollution.

Groundwater and Land Contamination

Landfilling of solid waste materials have the potential to contaminate both soil and groundwater.

Less Utility Usage + ***Less Waste Creation*** → ***Lighter Footprint***

Social Benefits



Employees

Attracting and retaining the best employees is influenced by several factors, including your approach to sustainability.

Consumers

The target market group for craft beer is very vocal and aligned with breweries that are considered sustainable and “doing the right thing”.

Community

Craft breweries can become an integral part of the community, versus an industry that pollutes and treats the workforce unfairly.

Engaged Employees + ***Loyal Consumers*** + ***Supportive Community*** → ***Successful Business***

Testimonials

Some things I have heard from craft brewers ….

- *I believe operating efficiently and responsibly will keep us profitable a long time.*
- *I have never tracked our utility billings. We just pay them. After entering the data I noticed billing errors that resulted in over $20,000 in refunds.*
- *My employees are thoroughly engaged and excited this is an environmental initiative that saves money.*
- *We are starting to see lower utility billings and we have yet to spend any capital.*

What are the Barriers?

Photo by Joshua Earle on Unsplash

Common Challenges

Taking on new initiatives is always limited by:

- Time
- Money
- Understanding

What are your barriers?

Some things I have heard from craft brewers ….

- *Sounds good, but I am way too busy now – call me later*
- *I don't care how inefficient I operate now – I need to make more beer to keep up with demand*
- *I don't have money for solar panels*
- *I need to invest any capital I have in production equipment, not efficiency improvements*
- *I already recycle and plan to add more recycling bins*

What is stopping you?

Breaking Down Barriers

Where do I start?

Economic

Environment

Social

Create a Plan of Attack

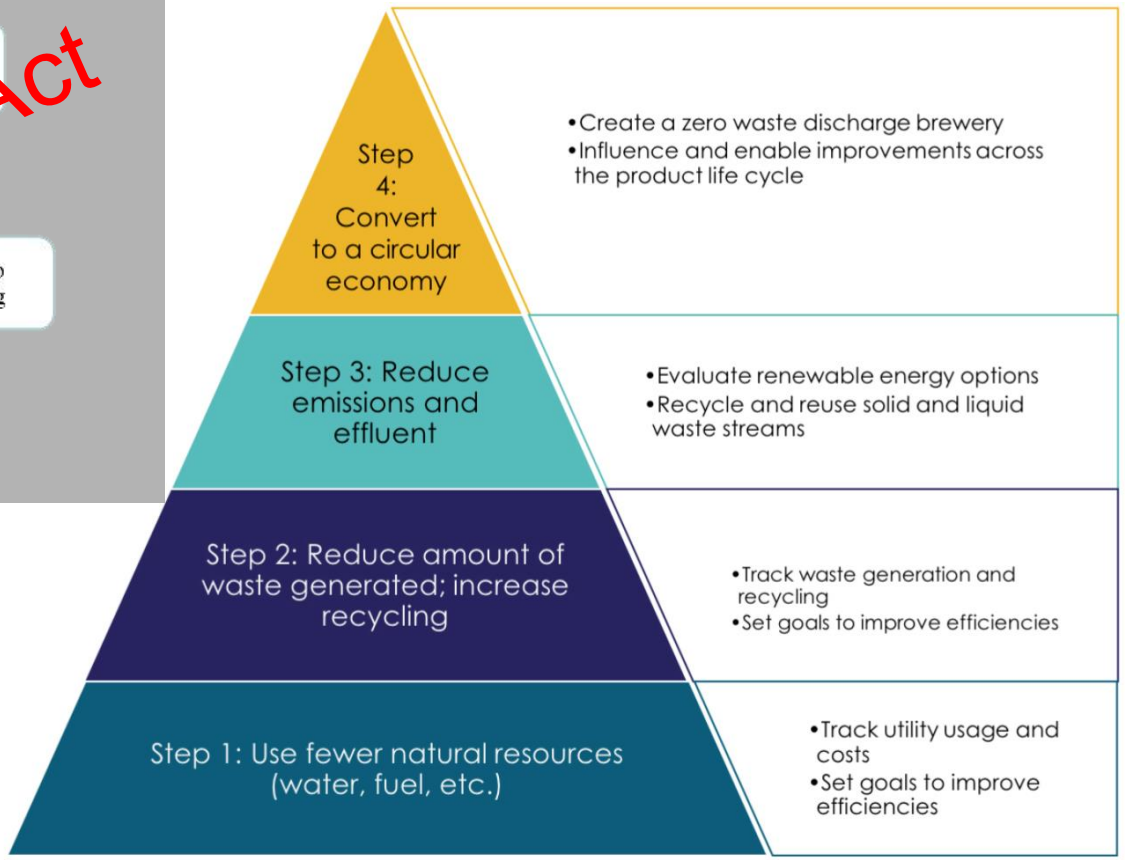
Would you invest in a brewery without creating a detailed business plan?

Would banks make you a loan without one?

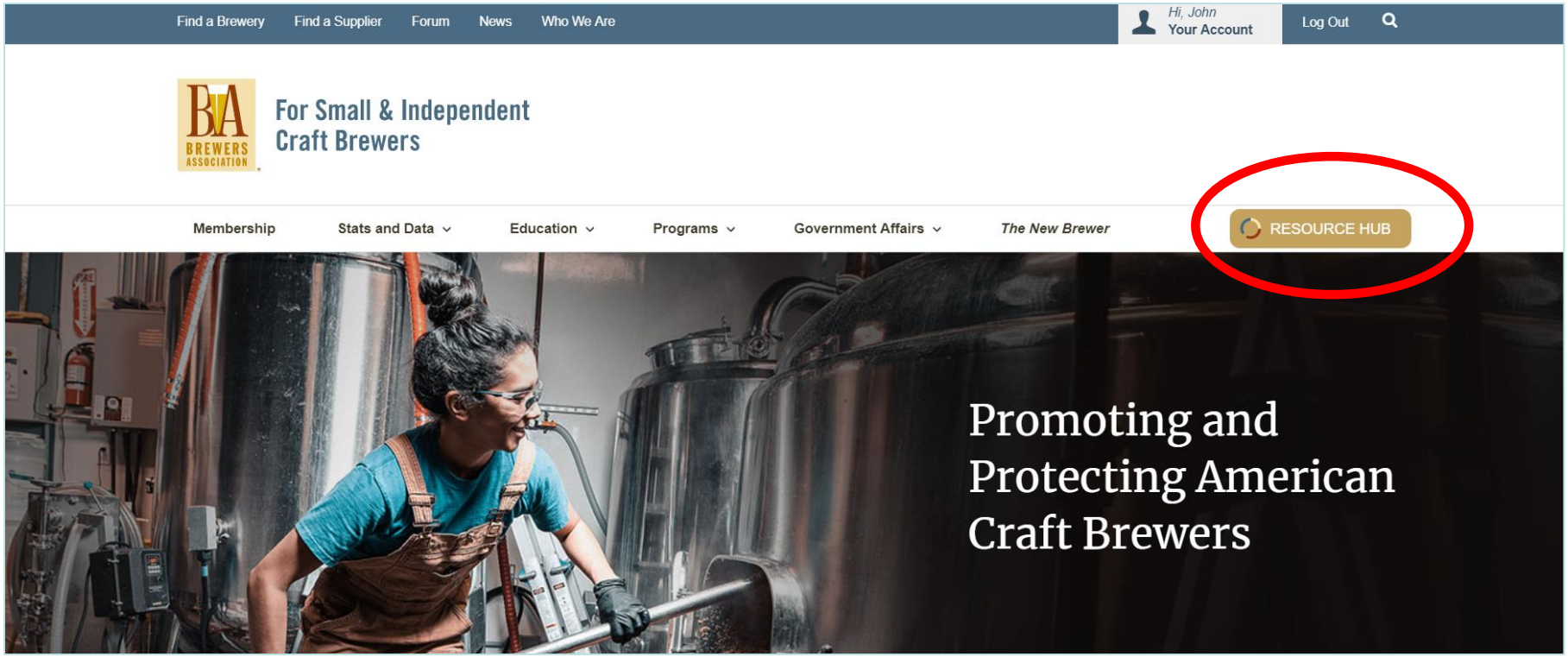
Why should we approach sustainability any differently?

Start with data – what gets measured gets improved

Use Process Thinking



Resources Available


Find a Brewery
Find a Supplier
Forum
News
Who We Are
Hi, John
Your Account
Log Out
For Small & Independent
Craft Brewers
Membership
Stats and Data
Education
Programs
Government Affairs
The New Brewer
RESOURCE HUB
Promoting and
Protecting American
Craft Brewers

RESOURCE HUB

Browse Resource Hub Categories

Explore the Brewers Association's most high-value resources and tools in one click.

Production
- Brewhouse
- Cleaning
- Fermentation
- Filtration
- Cellaring
- Packaging
- Sanitation

Ingredients
- Barley
- Hops
- Malt
- Water
- Yeast

Brewing Supplies
- Kegs
- Cans
- Glass
- Process Aids

Quality
- Analysis
- Lab
- Microbiology
- Sensory
- Food Safety

Safety
- Training
- Hazards
- Prevention
- OSHA

Sustainability
- Benchmarking
- Energy
- Green Building
- Solid Waste
- Wastewater
- Water Usage

Best Practices
- Beer Styles
- Draught Beer
- Engineering
- Maintenance
- Record Keeping

Business Model
- Brewpub
- Taproom
- Small Production
- Planning

Business
- Charitable Giving
- Finance & Accounting
- Management & Leadership
- Statistics & Trends

Sales & Marketing
- Beer & Food
- Distribution
- Marketing & Social Media
- Off-Premise Sales
- On-Premise Sales

Laws & Regulation
- Government Affairs
- FDA
- FSMA (Food Safety Modernization Act)
- TTB

Human Resources
- Employee & Mental Health
- Benefits & Compensation
- Hiring & Training
- Company Culture
- Diversity

RESOURCE HUB

Benchmarking

Environmental stewardship is a top priority for both craft brewers and craft beer enthusiasts. Maintaining a healthy balance between stewardship, social enrichment, and economic vitality is important to the future success of craft brewing. Through its benchmarking work, the Brewers Association and sustainability subcommittee encourages conscientious brewing practices that will ensure the long-term success of the craft beer industry.

FILTER RESULTS

(●) All ( ) Seminars ( ) Power Hour ( ) Educational Publications ( ) Articles ( ) The New Brewer

Refine Results

Displaying results -9-5 of 5

Educational Publications

Sustainability Benchmarking Tool

Member Exclusive

The Sustainability Benchmarking Tool is an easy to use spreadsheet-based template designed to help brewers track and decrease their use of natural resources. **Read More ›**

ASSOCIATION NEWS

Brewers Association Releases New Sustainability Benchmarking Tool

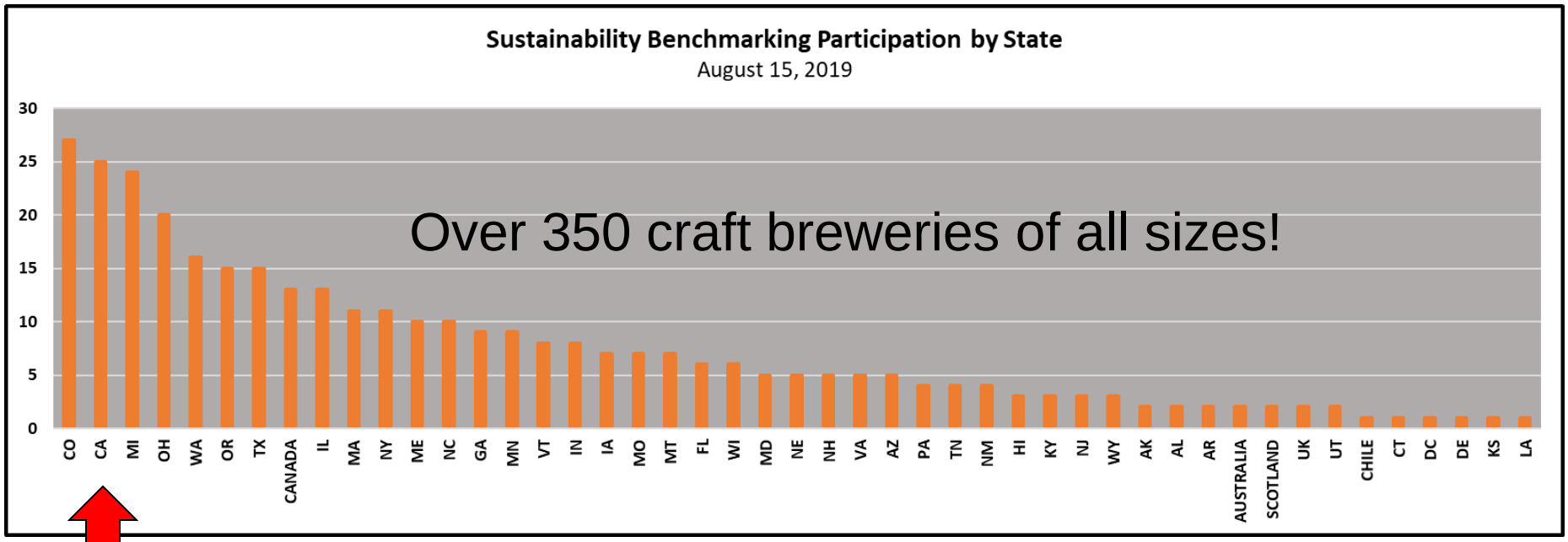
The Brewers Association today released the latest version of its Sustainability Benchmarking tool in a new spreadsheet-based format. This tool will enable brewers to track and reduce their resource use.

Read More ›

CERTIFIED BREWERS ASSOCIATION INDEPENDENT CRAFT

BA BREWERS ASSOCIATION

Benchmarking Participants



California Contributors

Taking this Seriously

Taking a Look

Angry Horse Brewing Company
Blaker Brewing Company
Discretion Brewing
Faction Brewing Company
Mike Hess Brewing
Modern Times Beer
Pizza Port Brewing Company
Seismic Brewing Company
SLO Brewery
Smog City Brewing Company
Societe Brewing Company
Steel Bonnet Brewing Company
Stone Brewing Co
Sudwerk Brewing Company
Woodcreek Brewing Company

Start Tracking Your Sustainability Efforts

The Sustainability Benchmarking Tool is an easy to use spreadsheet-based template and is available in two different versions: basic or advanced.

Fill out the form below to gain access to the Sustainability Benchmarking Tool Excel templates. After completing the form, you will receive an email with links to download both versions of the tool.

Access the Sustainability Benchmarking Templates

Name *

First Last

Email Address *

Brewery Name *

Submit

Menu Driven Excel File

Easy Data Entry

Sustainability Benchmarking
Basic Data Input

Main Menu

XYZ Brewery

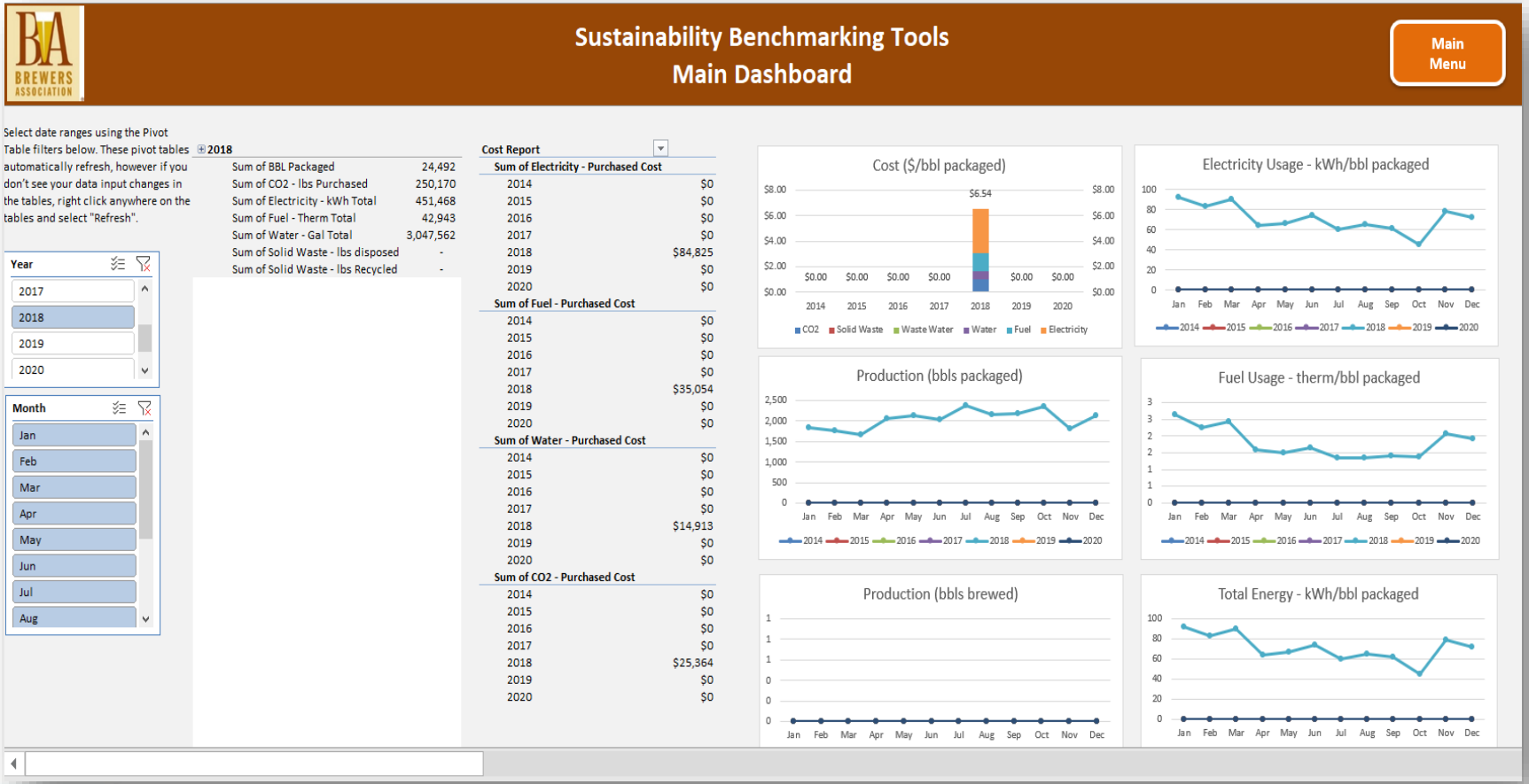
Resource Key Performance Indicators (KPI's)	Units	2018 Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18
BBL Packaged (Default Normalizing Factor)	bbl	1,836	1,766	1,655	2,063	2,127	2,035	2,376	2,157	2,181	2,363	1,813
Electricity - Total Purchased Usage	kWh	26,734	30,802	31,630	35,558	47,376	52,365	49,060	55,321	44,902	10,511	33,301
Electricity - Total Purchased Cost	$	5,162	5,936	5,931	6,989	8,763	9,754	9,031	10,153	8,397	1,961	5,218
Electricity - Solar Generated On-site (if applicable)	kWh											
Fuel - Total Purchased Usage	therm	4,868	3,947	4,008	3,294	3,211	3,375	3,218	2,903	3,062	3,279	3,735
Fuel - Total Purchased Cost	$	4,885	3,936	4,246	3,671	2,881	1,886	1,826	1,641	1,746	1,865	2,510
Fuel - Biogas Generated On-site (if applicable)	therm											
Water - Total Purchased Usage	gal	249,849	249,849	249,849	230,649	230,649	230,649	267,055	267,055	267,055	268,301	268,301
Water - Total Purchased Cost	$	1,226	1,226	1,226	1,132	1,132	1,132	1,297	1,297	1,297	1,316	1,316
Water - Groundwater Pumped On-site (if applicable)	gal											
Wastewater - Municipal/Private Treatment Works Disposal Cost	$											
Off-site Waste Disposal Quantity (typically estimated)	lb											
Off-site Waste Disposal Cost	$											
Off-site Waste Recycling Quantity (typically estimated)	lb											
Off-site Waste Recycling Revenue	$											
CO2 - Total Purchased Quantity	lb	17,520	9,260	20,480	18,600	8,100	25,990	20,000	51,390	19,500	21,980	18,200
CO2 - Total Purchased Cost	$	1,796	949	2,099	1,907	830	2,664	2,050	5,267	1,901	2,143	1,774

You have selected to use the Basic Data Input Sheet. The majority of breweries will use this sheet to enter their key sustainability related data. Determine which month to start entering data. It is always good to start with January and go back at least two years from the current year. However, there is no right or wrong month to select. Just get started!

BREWERS ASSOCIATION CERTIFIED INDEPENDENT CRAFT

BREWERS ASSOCIATION

Intuitive Dashboards



Progress Reports

Sustainability Benchmarking Tools
Monthly Scorecard

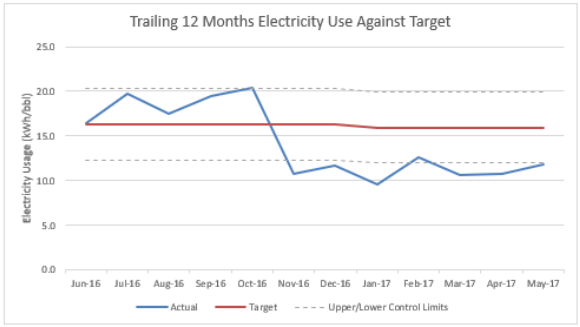
Main Menu

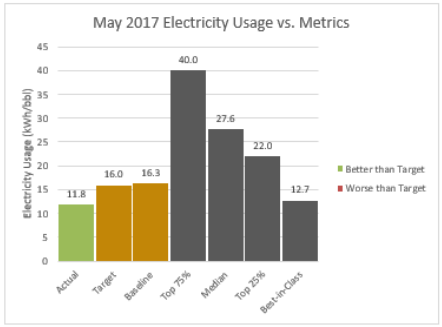
Select Year
2017

Select Month
May

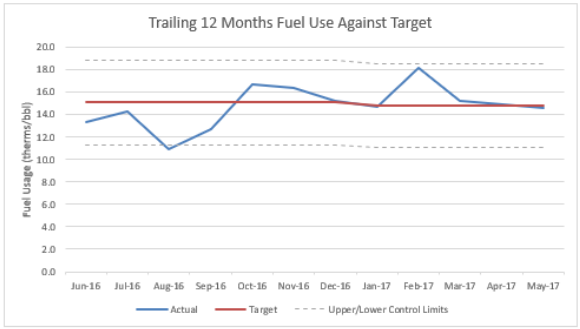
Control Limit
25%

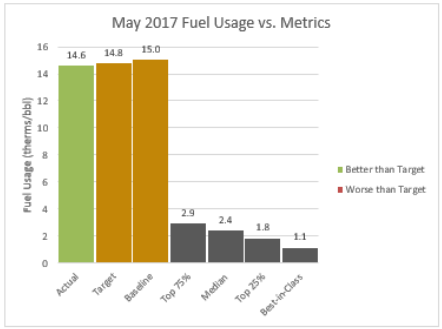
This Month: $5,165 saved
(vs. Baseline)
Past 12 Months: $25,139 saved
(vs. Baseline)



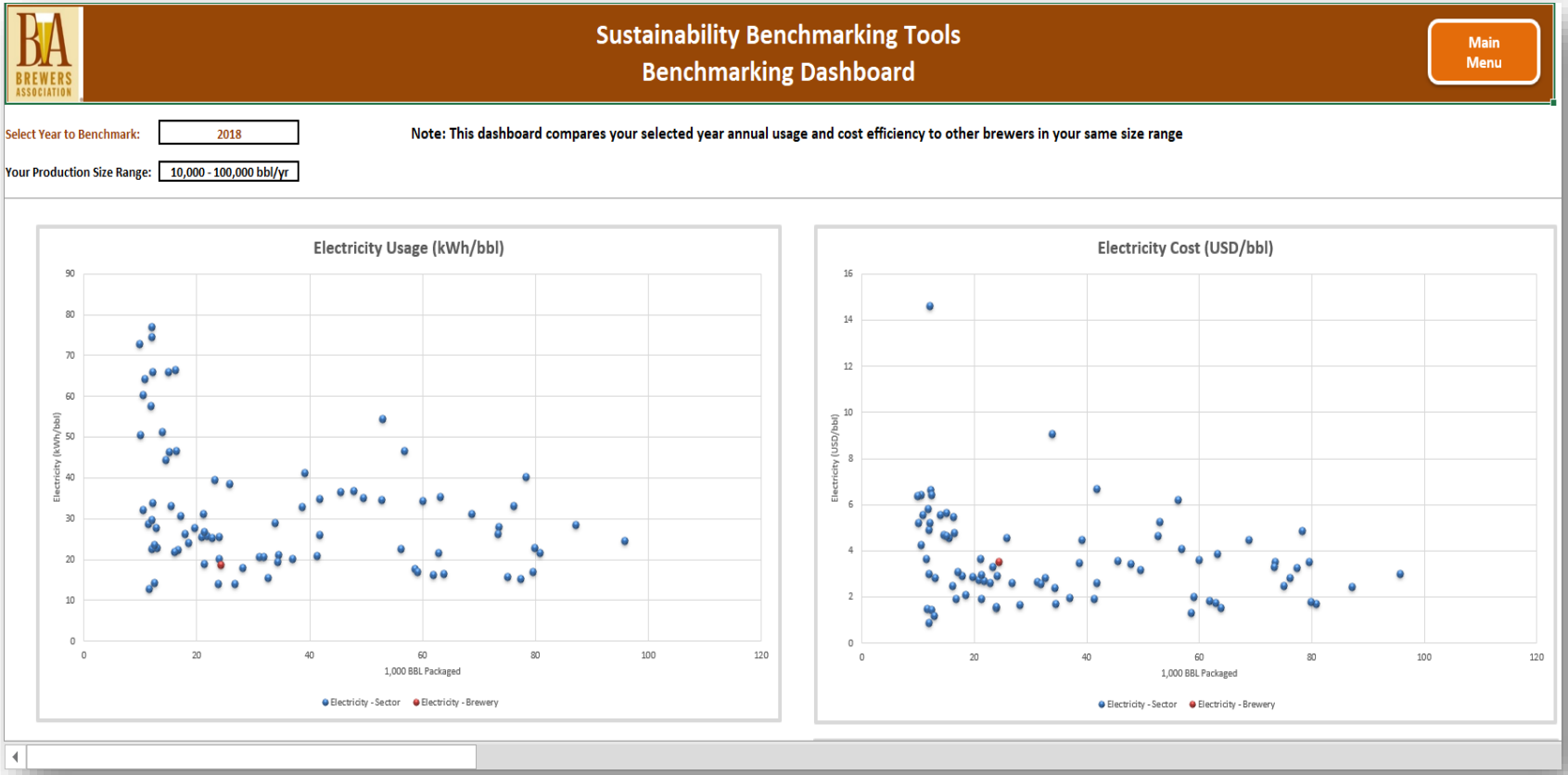


This Month: $416 saved
(vs. Baseline)
Past 12 Months: $9,737 saved
(vs. Baseline)

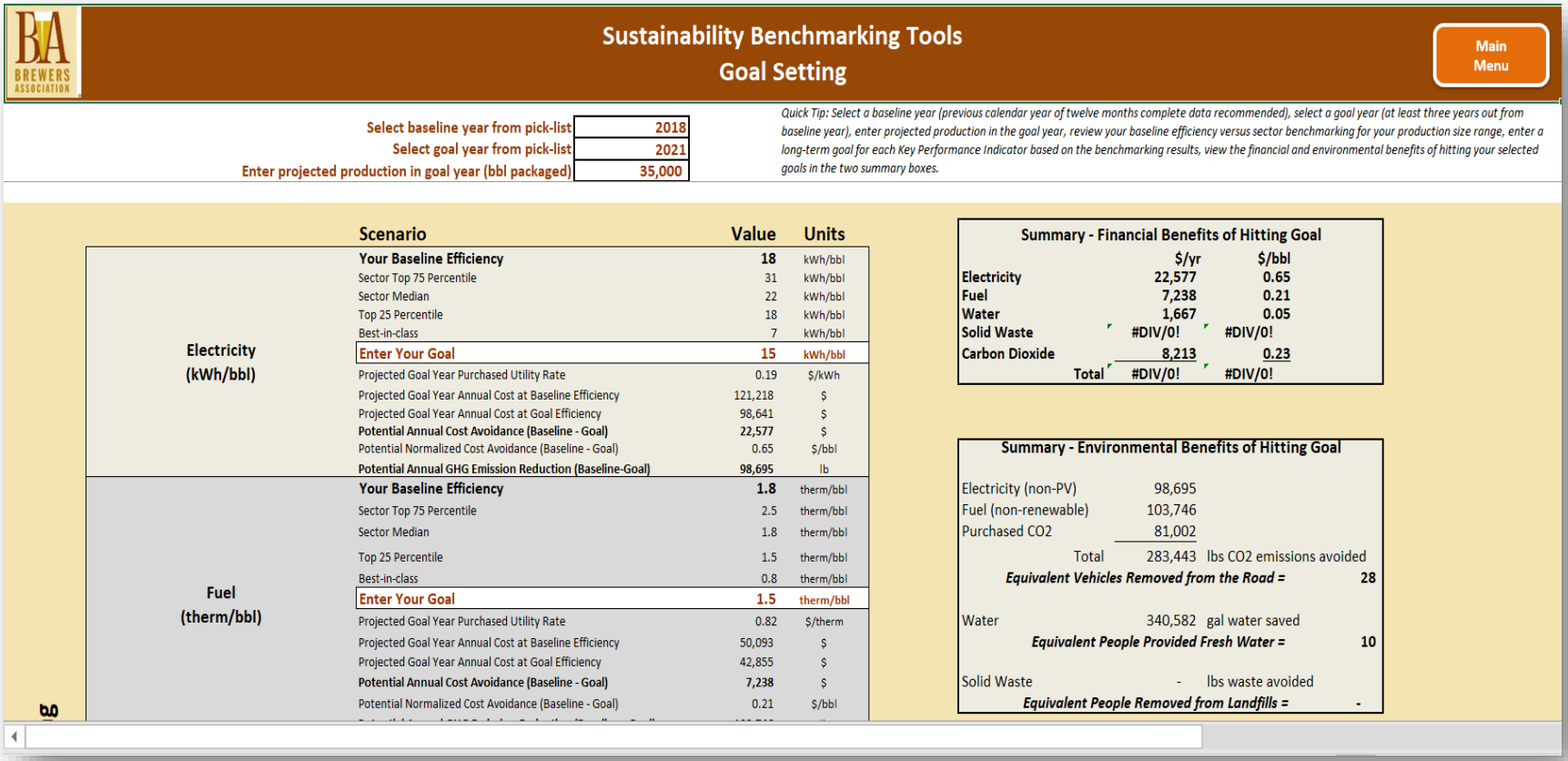




Comparisons to Others



Scenario Planning



Sustainability Benchmarking Tools
Goal Setting

Main Menu

Select baseline year from pick-list	2018
Select goal year from pick-list	2021
Enter projected production in goal year (bbl packaged)	35,000

Quick Tip: Select a baseline year (previous calendar year of twelve months complete data recommended), select a goal year (at least three years out from baseline year), enter projected production in the goal year, review your baseline efficiency versus sector benchmarking for your production size range, enter a long-term goal for each Key Performance Indicator based on the benchmarking results, view the financial and environmental benefits of hitting your selected goals in the two summary boxes.

	Scenario	Value	Units
Electricity (kWh/bbl)	**Your Baseline Efficiency**	**18**	kWh/bbl
	Sector Top 75 Percentile	31	kWh/bbl
	Sector Median	22	kWh/bbl
	Top 25 Percentile	18	kWh/bbl
	Best-in-class	7	kWh/bbl
	Enter Your Goal	**15**	kWh/bbl
	Projected Goal Year Purchased Utility Rate	0.19	$/kWh
	Projected Goal Year Annual Cost at Baseline Efficiency	121,218	$
	Projected Goal Year Annual Cost at Goal Efficiency	98,641	$
	Potential Annual Cost Avoidance (Baseline - Goal)	**22,577**	$
	Potential Normalized Cost Avoidance (Baseline - Goal)	0.65	$/bbl
	Potential Annual GHG Emission Reduction (Baseline-Goal)	**98,695**	lb
Fuel (therm/bbl)	**Your Baseline Efficiency**	**1.8**	therm/bbl
	Sector Top 75 Percentile	2.5	therm/bbl
	Sector Median	1.8	therm/bbl
	Top 25 Percentile	1.5	therm/bbl
	Best-in-class	0.8	therm/bbl
	Enter Your Goal	**1.5**	therm/bbl
	Projected Goal Year Purchased Utility Rate	0.82	$/therm
	Projected Goal Year Annual Cost at Baseline Efficiency	50,093	$
	Projected Goal Year Annual Cost at Goal Efficiency	42,855	$
	Potential Annual Cost Avoidance (Baseline - Goal)	**7,238**	$
	Potential Normalized Cost Avoidance (Baseline - Goal)	0.21	$/bbl

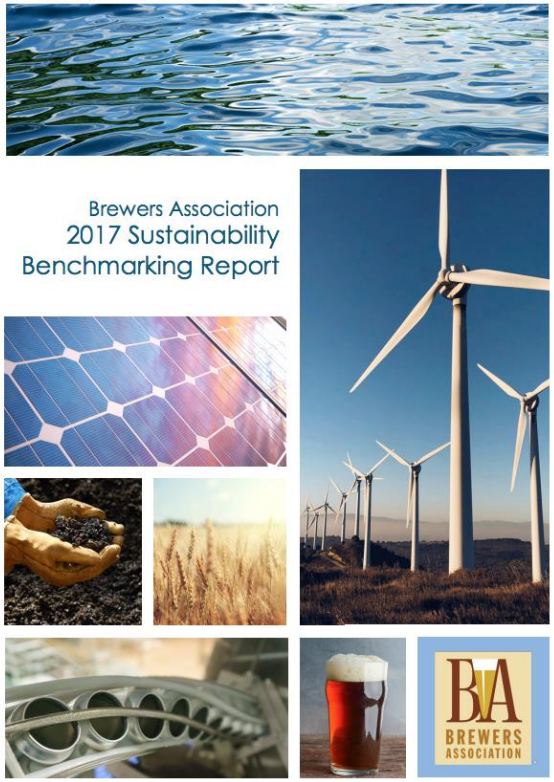
Summary - Financial Benefits of Hitting Goal

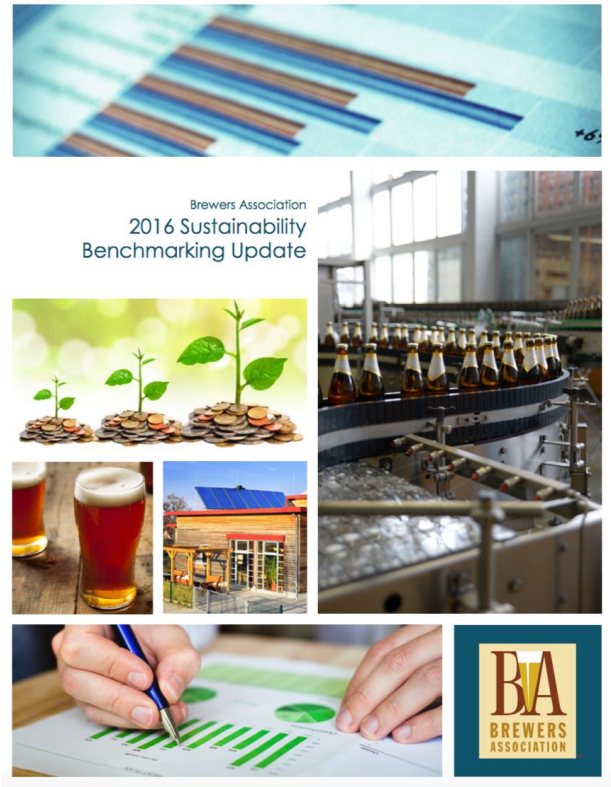
	$/yr	$/bbl
Electricity	22,577	0.65
Fuel	7,238	0.21
Water	1,667	0.05
Solid Waste	#DIV/0!	#DIV/0!
Carbon Dioxide	8,213	0.23
Total	#DIV/0!	#DIV/0!

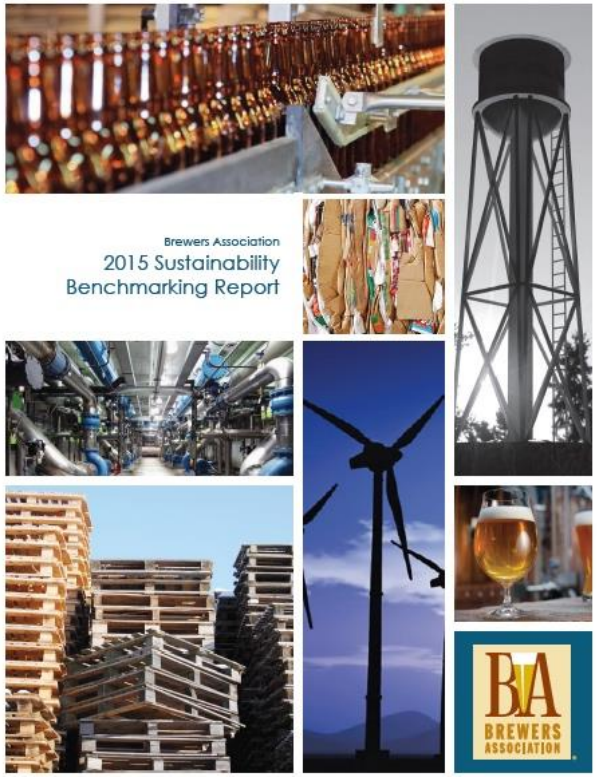
Summary - Environmental Benefits of Hitting Goal

Electricity (non-PV)	98,695	
Fuel (non-renewable)	103,746	
Purchased CO2	81,002	
Total	283,443	lbs CO2 emissions avoided
Equivalent Vehicles Removed from the Road =		28
Water	340,582	gal water saved
Equivalent People Provided Fresh Water =		10
Solid Waste	-	lbs waste avoided
Equivalent People Removed from Landfills =		-

Benchmarking Reports







CERTIFIED
BREWERS ASSOCIATION
INDEPENDENT CRAFT

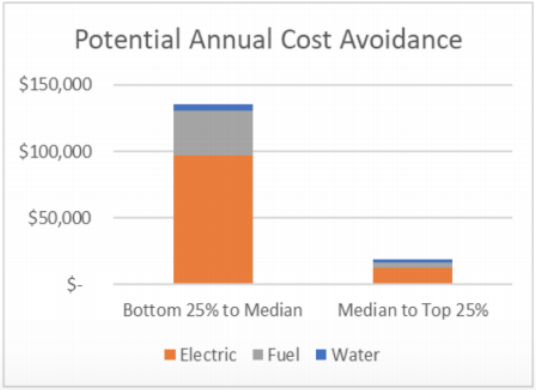
BA
BREWERS
ASSOCIATION

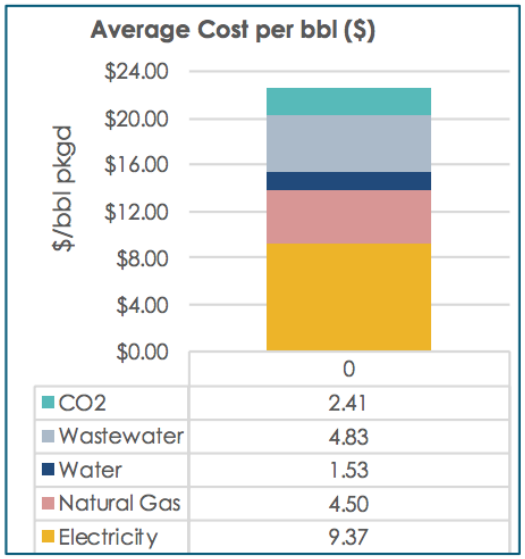
Benchmarking Insights

Production Volume (bbls/yr)	Participants	Membership
1 to 1,000	7 breweries	3,175 breweries
1,000 to 10,000	23 breweries	1,254 breweries
10,000 to 100,000	28 breweries	218 breweries
100,000 to 1,000,000	10 breweries	32 breweries

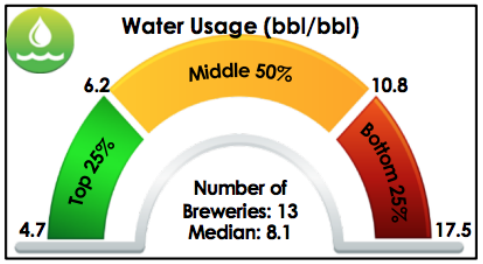
Potential Cost Avoidance by improving efficiencies and moving from the:

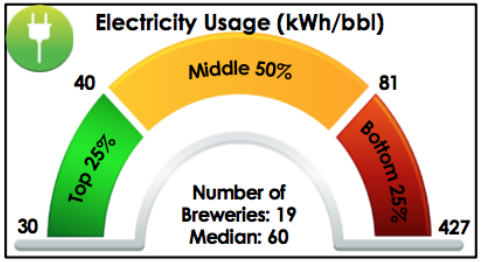
- **Bottom 25% to the Median; or**
- **Median to Top 25%**

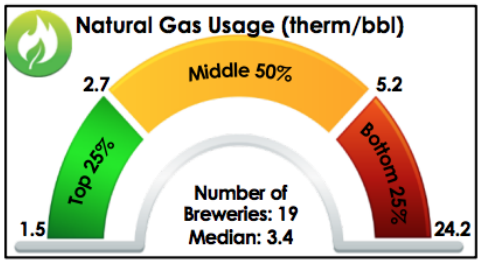


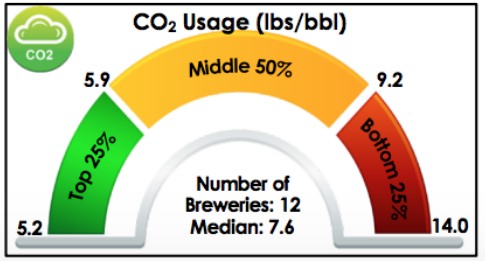


Usage Efficiency





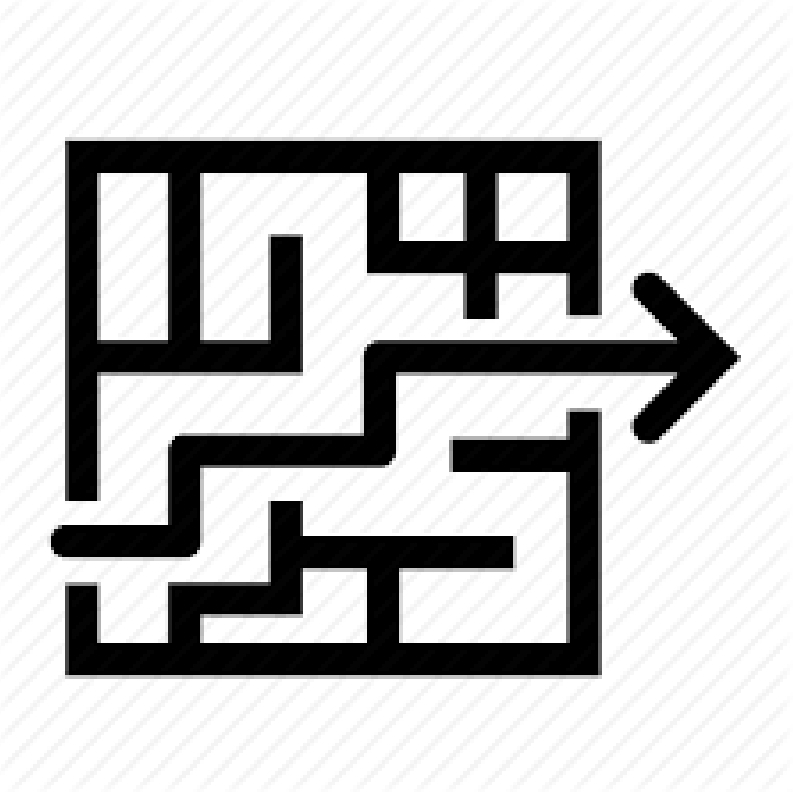




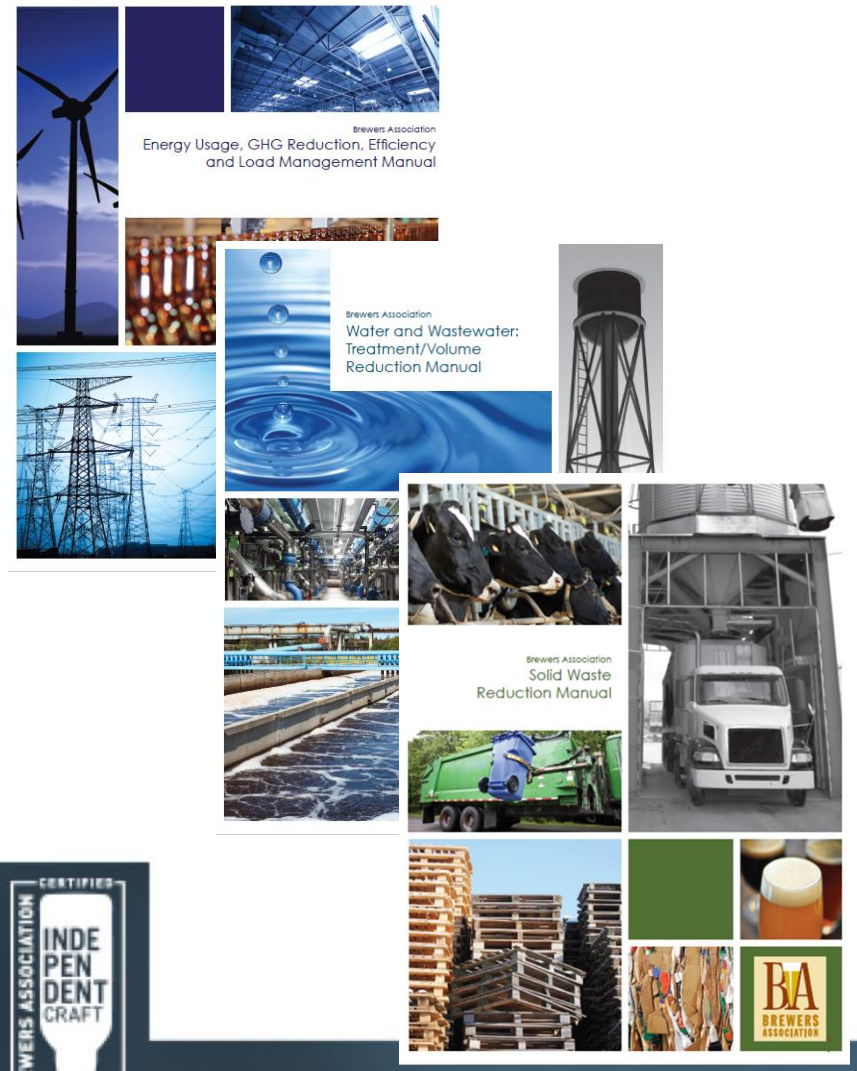
Execution

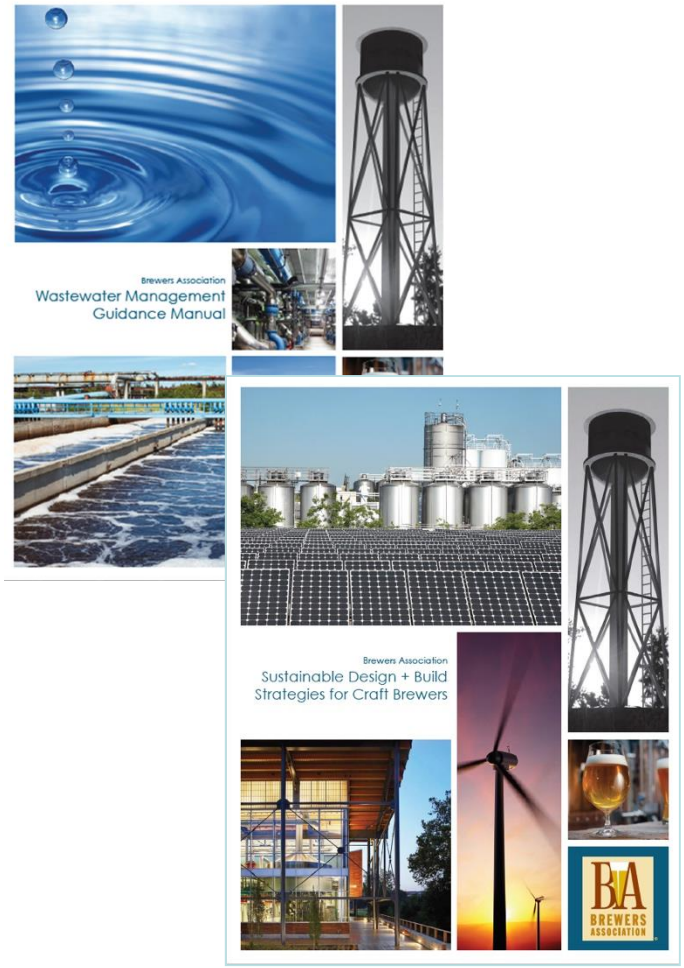
Using the benchmarking tool:

- I know where I am
- I know where I want to be
- But, how do I get there?



Best Practice Guidance





BREWERS ASSOCIATION CERTIFIED INDEPENDENT CRAFT

BA BREWERS ASSOCIATION

Best Practice Tools

Energy Toolkit

Energy Manual (6M)

Energy Management Handout

Guidance

Set-Points

Employee Engagement

Insulation

Lighting

Checklist

Energy Audit

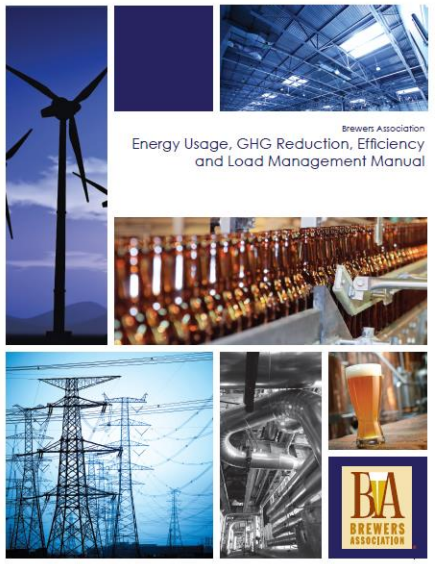
Future Design Tips

Spreadsheet Tools

Energy/GHG Data Collection

Renewable Energy Cost

Calculator



- Brewery Use Details
- Data Management
- Efficiency Best Practices
- On-site Strategies
- Brewery Case Studies

How are others getting there?

Rising Tide Brewing Co.

Rising Tide Brewing Co. has been continually improving its energy efficiency over the past few years through a number of equipment and process changes. The brewery reports that energy efficiency has continued to increase as production volume increases, and as discussed in this report, electricity is part of the baseload for operations at all breweries. Economies of scale do not necessarily play a part until production greatly increases. In line with the industry, Rising Tide Brewing Co. was experiencing overhead costs for electricity use, regardless of whether they were making beer at the time. This overhead cost added up over time. They noted efficiency improvement once their production began increasing.

In an effort to further increase their electrical efficiency, the entire facility is undergoing a lighting retrofit to LEDs. Because of their increased production, the brewery was also able to program their steam boiler to run 24 hours a day, seven days a week. With this new operation, the boiler gives off continual waste heat from the brewing process; however, the facility utilizes its waste heat in the winter to heat their building. Also, they've changed their brewing process to maintain the temperature of their hot liquor tank hot at all times, which eliminates the need to reheat the tank after three to four days of sitting idle. In 2016, they installed a high-efficiency air compressor with a 400-gallon storage tank for their canning operations. This set a wide tolerance range so that the compressor does not short-cycle. It cycles on and stays on until the system reaches the high set point, and then allows the pressure to drop to a low set point before turning back on. This runs a lot more efficiently than their old compressor, which ran constantly regardless of cycle length.

The biggest hurdle Rising Tide Brewing Co. faces is determining the impact modifications will have on their production process. Sometimes impacts are unknown and could be positive or negative; these unfamiliar results stem from data limitations and unidentified interdependent processes - it can be challenging to gather the appropriate measurements when a brewery is running at full tilt. Another hurdle is dealing with beer loss as it has a direct correlation to product volume, profitability, and KPIs. Rising Tide Brewing Co. has noted their losses primarily at the fermentation/brite tank stage and at packaging.

Location: *Portland, ME*

Market Segment: *Microbrewery*

Rising Tide Brewing Co. Production Team

Rising Tide Brewing Co. has implemented measures to reduce beer loss including:

- Sending clean beer to the fermenter with low hop/yeast residue qualifications so they can pull beer from the bottom of the tank instead of the top utilizing the racking arm, in turn saving 1 bbl/batch;
- Monitoring overfill of packaging and dissolved oxygen by using combined meters and tuning equipment;
- Training operators to view the packaging line as an instrument instead of a machine, which minimizes shutdowns and spills;
- Pre-chilling the line so that less beer is lost at the start of a batch; and,
- Monitoring the flow meter to determine the primary source of beer loss.

One area of focus for the next year is increasing CO_2 usage efficiency, as Rising Tide Brewing Co. experiences significant venting loss during filling. The brewery currently pays more than the industry average for CO_2, and minimizing CO_2 loss will prove more valuable from an environmental and cost-benefit perspective. They are installing new meters and looking to move to a bulk CO_2 system instead of their two 750 lb tanks.

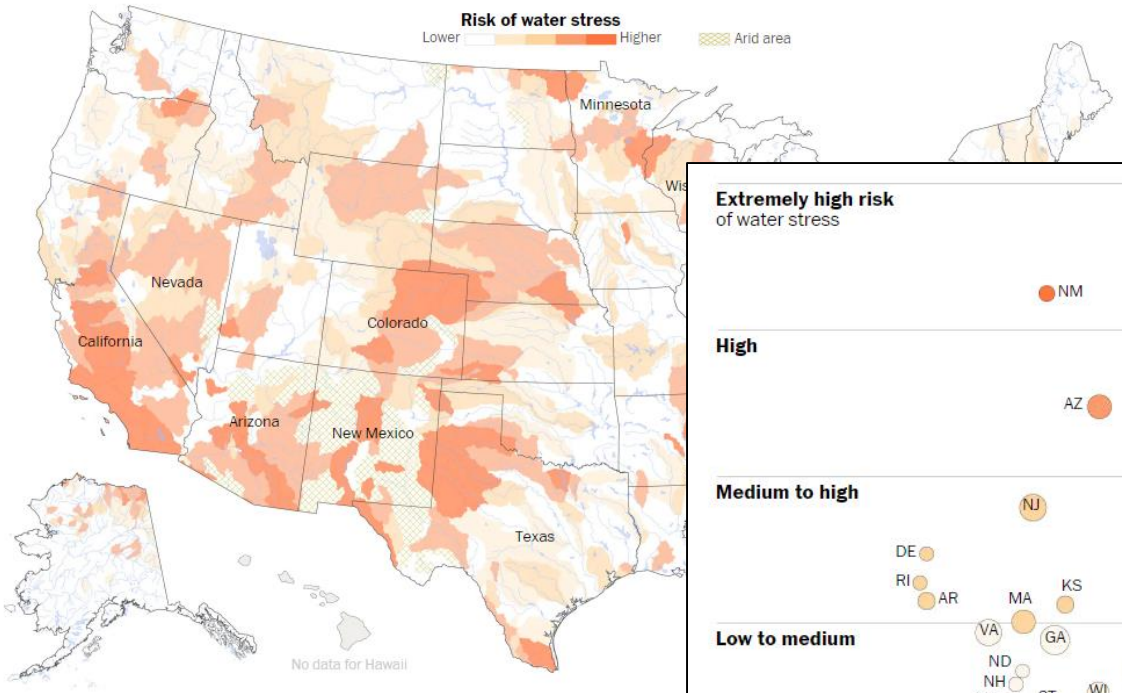
Rising Tide Brewing Co.'s culture has made sustainability a focus in every part of their operations. They have been working to empower their staff, who appreciate the focus on sustainability. The brewery has now formed an official sustainability team, and they are hoping for ideas, initiatives, and improved efficiency results to come out of this in-house group.

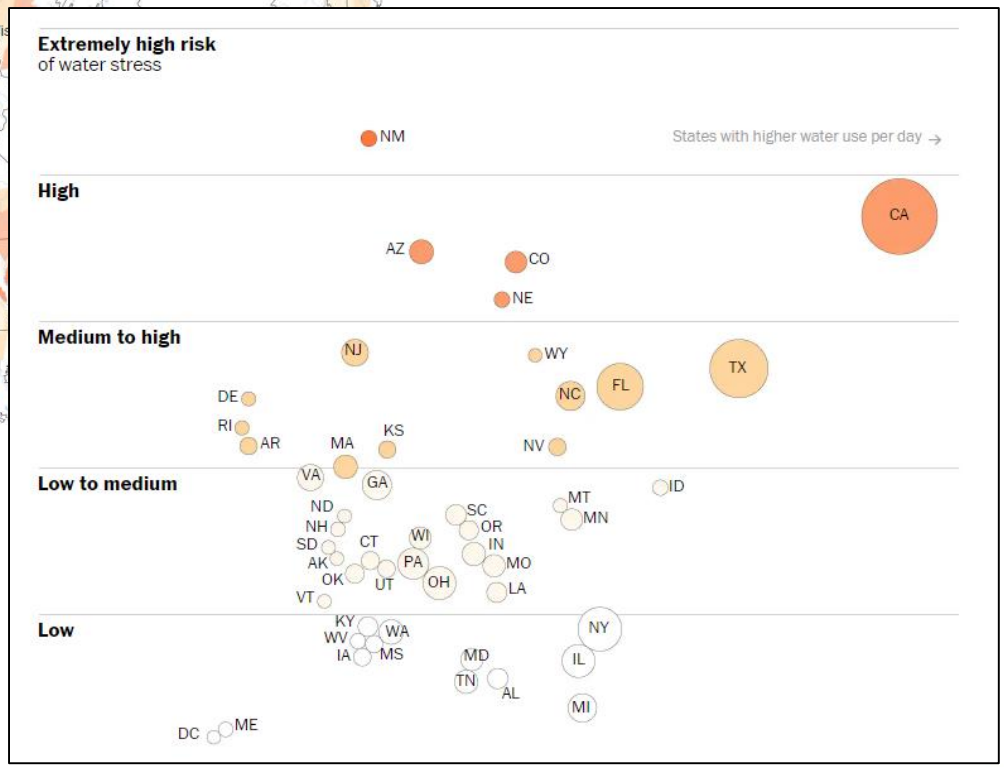
Show Me The Money

Size Category	Example Annual Production (bbls)	Average Cost per bbl	Best In Class Cost per bbl	Potential Cost Savings
0 – 1,000 bbls	900	$65.78	$32.31	$30,123
1,000 – 10,000 bbls	5,000	$22.80	$8.54	$71,300

- ✓ Do you know your costs?
- ✓ How do you compare to others?
- ✓ How much could you potentially save?

Show Me The Problem





Let's Get Through These Barriers Together!

- Benchmarking Tools
- Best Practice Guidance Manuals
- Best-in-Class Case Studies
- BA Technical Support Team

Questions?

- John Stier
  - SustainabilityMentor@BrewersAssociation.org
- Matt Gacioch
  - SustainabilityAmbassador@BrewersAssociation.org
- BA Sustainability Subcommittee