



2018
Sustainability
Report



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From the Chief Executive Optimist

Though "optimist" is literally the final word in my job title, I'm also by nature a realist. That's why, since starting Fullsteam seven years ago, I've been hesitant to call our brewery "sustainable." I didn't want to make any claims on a term that is, all too often, used indiscriminately.

After all, we're a small brewery -- and rather inefficient, at that. We crank out 8,000 barrels, twelve barrels at a time. And while our "plow to pint" brewery is passionate about sourcing local ingredients, that's only one component of the triple bottom line.

I'm now proud to say that we are a sustainable brewery. And that's really because of the leadership and sheer willpower of our Lead Brewer, Amanda Richardson. Amanda has quietly lead the brewery to be a better steward of our planet and our community. The results are impressive: lower water usage. Reduced energy. Green certifications. A record amount of local sourcing. Fair wages. Engaged, informed employees...all working together to do even more in 2018 and beyond.

We started in 2010 with a mission: to pioneer a post-tobacco Southern Beer Economy. I hope you can see from this report that our mission -- and our impact -- goes far beyond buying local. Thanks to Amanda's leadership, vision, and passion, we've set our benchmarks. We can see the positive impact of our investments and choices. We can track our social, economic, and environmental good. We can, and we will, do even more in the years ahead.

There's a certain satisfaction that comes when your initial business idea comes to fruition: when you realize a crazy idea actually has some merit. But that sense of fulfillment pales in comparison to the feeling you get when you realize your staff is way ahead of you. That they're the ones paving the way. That's how I feel when I read the accomplishments in the pages ahead -- innovations that are so beyond my initial vision.

This report -- and the people behind it -- is why I'm an optimist.

Sean Lilly Wilson
Chief Executive Optimist
Fullsteam Brewery

About Fullsteam

Located in Durham, North Carolina, Fullsteam Brewery's mission is to craft distinctly Southern beer that celebrates the farm and food traditions of the American South. We seek to do so by crafting a Southern Beer Economy, supporting local farmers, foragers, and agricultural entrepreneurs through the act of commerce. We follow through on this mission by buying local ingredients, creating jobs and wealth for North Carolina farmers and food producers, and creating an inviting community that passes this Southern Beer Economy along to others.

Since opening our doors in 2010, Fullsteam's production has steadily grown. Between 2015 and 2018, production numbers increased by 50%. In 2017, we expanded our services by adding a kitchen, allowing us to provide a Southern comfort food menu to complement our beer offerings.

Sustainability Overview

Since our founding, we have focused on sustainability by sourcing local ingredients, treating employees fairly, and building a strong local community. While sustainability has always been built into our mission, a formal sustainability program was initiated in 2015 due to the realization of how much waste our brewery was creating. This awareness prompted our employees to do more to reduce our environmental impact. We were already composting our biodegradable waste, but we started to look at our resource consumption by having waste, water, and energy audits done by Waste Reduction Partners. In 2016, we performed an LED retrofit, reducing our electricity consumption per barrel brewed by 27%. Since then, we have installed lighting motion sensors, electric hand dryers and dual-flush toilets, started using knock out water for cleaning, and partnered with local organizations such as Don't Waste Durham.



2018 Sustainability Goals

Every year, Fullsteam seeks to become more sustainable by lowering our energy and water use, reducing the amount of waste we landfill, sourcing more local ingredients, and forming partnerships that foster sustainability in our community. In April 2017, we set annual goals to reduce our energy use, water use, and waste in an attempt to quantify our efforts and progress. Our specific goals for each sector are laid out below.

Brewery Energy

Between April 2017 and March 2018, we sought a 10% reduction in brewery energy use. Our energy use refers to both electricity and natural gas use and is measured in kWh (electricity) and therms (natural gas) per barrel brewed. To report total energy use, therms were converted to kWh and added to electricity.

Water

Between April 2017 and March 2018, we sought to reduce water consumption by 20%. Our water use is measured in gallons of water per barrel brewed, but the Brewer's Association reports in barrels of water per barrel brewed. Gallons are converted to barrels when comparing our use to the industry average.

Waste Management

Between April 2017 and March 2018, we aimed to reduce our solid waste generation by 30%. This is measured by weight. We also sought to reduce the number of missorting events by 30%.

Transportation Energy

Between April 2017 and April 2018, we sought to implement a no idling policy for our fleet and deliveries, incorporate bike parking into any improvements made on our Rigsbee property, and retrofit any company vehicles.

FULLSTEAM BREWERY 2018 SUSTAINABILITY GOALS

ENERGY USE

2016 Energy Use: 123 kWh/barrel
Goal: 10% reduction
Target: 111 kWh/barrel

WATER USE

2016 Water Use: 270 gal/barrel
Goal: 20% reduction
Target: 243 gal/barrel

WASTE MANAGEMENT

Collect weight of waste produced
Reduce landfilled waste by 30%
Reduce missorted items by 30%

TRANSPORTATION

Implement no idling policy
Incorporate more bike parking
Retrofit fleet vehicles

Energy

In September of 2016, we underwent our first energy efficiency initiative, an LED retrofit. The initiative lowered our average monthly electricity use by 27%. Due to this retrofit and other initiatives, our overall electricity use in 2017 was lower than our overall electricity use in 2015, despite a 53% increase in production during that period.

Electricity

In order to continue the electricity savings from the LED retrofit, and to meet our 2018 sustainability goals, we installed occupancy sensors in the public bathrooms in March of 2017. Additionally, we started educating our staff on the importance of turning off lights and running pumps for the appropriate amounts of time. We also made an effort to better insulate our climate controlled tasting room and to monitor the thermostat so as to reduce energy use.

During this time, we have also added to our electricity use with the addition of a kitchen and electric hand dryers in the bathrooms.

From April 2017 to March 2018, our electricity use was 35.9 kWh per barrel brewed. This is a **22.33%** reduction in electricity use when compared to our previous year's use of 46.22 kWh/BBL. While the goal of a 10% reduction was for total energy use, not just electricity use, this reduction far exceeds our goal.



Industry average refers to the median of similarly sized breweries (1,000 - 10,000 barrels/year) as reported in the Brewers Association 2016 Sustainability Benchmarking Update.

Energy

Natural Gas

Natural gas is used for brewing, and space heating in the seating area. While no major natural gas retrofits were done between April 2017 and March 2018, we made a conscious effort to reduce our natural gas use through staff education, efficient use, and lowering our seating area temperature in the winter.

From April 2017 to March 2018, our total natural gas use was 2.48 Therms/BBL, giving us a **5.36%** reduction. While this reduction does not meet the 10% goal, the goal was set for overall energy use, not just natural gas use.

Brewery Energy Use Totals

Combining the electricity and gas use for March 2017-April 2018, we were able to reduce our brewery total energy use by **11.7%**. This exceeds our goal of a 10% reduction.

Transportation Energy

Between April 2017 and March 2018, we implemented a no idling policy for all of our fleet vehicles and trucks delivering to our facility. Additional bike parking and retrofitting existing fleet vehicles remain goals, but have not yet been completed.



Industry average refers to the median of similarly sized breweries (1,000 - 10,000 barrels/year) as reported in the Brewers Association 2016 Sustainability Benchmarking Update.

Water

Water is not only used to make the beer we brew, it is also used for cooling, cleaning, kitchen use, and by our customers. Due to this, we use a lot of water, and it is very important that we focus on reducing our use. Between April 2017 and March 2018, our total water use was 1,694,753 gallons, giving us an average use of 270 gallons/BBL. To meet our 20% reduction goal, we had to lower our water use to 216 gallons/BBL.

To limit our brewing water use, we began using knockout water for cleaning purposes in March 2017. The next phase of water reduction will be to use this water for brewing. We also started training and requiring our staff to look for and report water leaks.

In the taproom, low flow, dual-flush toilets were installed in July of 2017 to reduce our customer's water use. From April 2017 to March 2018, our total water use was 1,163,706 gallons, giving us an average use of 147.14 gallons/BBL. This means we had a **46%** reduction in relative water use, exceeding our goal by 26%.



Industry average refers to the median of similarly sized breweries (1,000 - 10,000 barrels/year) as reported in the Brewers Association 2016 Sustainability Benchmarking Update.

Waste Management

Over the past year, we have implemented numerous initiatives to reduce the amount of waste we send to the landfill. We installed energy efficient hand dryers to eliminate paper towel use, began purchasing refillable products (e.g. Fillaree soap products), explored ways to divert items from the landfill (e.g. plastic films), and encouraged our customers to engage in waste reducing behavior (e.g. bring water bottles). In addition, we have worked to reduce the number of items that are incorrectly sorted. We have done this through both staff and customer education. In February 2018, a new waste station was constructed that has separate bins for trash, recycling and compost. Instructional signage is posted above each bin, helping customers decide how to dispose of their waste.

Unfortunately, we were unable to receive weights from our waste management provider. As a result, we are uncertain whether we met our 30% reduction goal. While we cannot report the weight of our waste, we were able to avoid increasing our dumpster size or frequency of pickups despite a 26% increase in production from the previous year.

To track the number of missorting events, we administered a ten week survey consisting of weekly sampling. This returned a 76% missorting rate, which means we were unable to meet our 30% reduction goal. The new waste station was installed at the end of the survey period, and we hope that this addition will reduce the number of missortings in the future.



Local Sourcing

As part of our mission, we use as many local ingredients as possible in order to support our local farmers and reduce our environmental impact. In 2017, we purchased over 77,000 pounds of locally farmed and locally value-added ingredients (we define "local" as "within North Carolina," and value-added ingredients includes coffee and some grain that was not farmed locally.) These ingredients alone contributed over \$75,000 to the local economy.

At a minimum, every beer we brew is at least 10% local by weight.

Last year, we purchased 53,408 pounds of grains from a business located three miles from the brewery..

By purchasing these grains locally, we saved over seven tonnes of carbon dioxide from being emitted, along with supporting our local economy.

We brewed two beers in collaboration with Triangle Land Conservancy (TLC). One of the ingredients, autumn olive, is an invasive species that the community foraged on one of TLC's properties. We donated a portion of proceeds from these beers to TLC.

Community Partnerships

We are also working to promote sustainability within the community by supporting and partnering with local organizations and by educating customers in the brewery. For example, Fullsteam works with Triangle Ecycling to collect computers and cell phones to be recycled. We were also a corporate sponsor of Don't Waste Durham's reusable take-out container kickstarter, GreenToGo. Through this program, customers are able to check out reusable take-out containers at participating restaurants.

Our new waste station has a separate bin for these take-out containers, increasing the connectivity of Durham's sustainability-minded local businesses. The brewery also co-hosted a tree planting event with Keep Durham Beautiful, The Durham Originals, and the Urban Forestry Division. Over 200 trees were planted in the Durham community during this event. Lastly, our spent grain is donated to farmers and dog biscuit makers, ensuring a circular economy for Fullsteam's ingredients.

Used items and materials are donated to the Scrap Exchange, TROSA, and individual community members for reuse. Fullsteam partnered with members of the North Carolina Department of Environment Quality to try and find a way to recycle plastic films, such as grain bags, mylar and stretch wrap, that can't be recycled in Fullsteam's current system.



This partnership resulted in the identification of a facility that can process those plastic films and we are now figuring out feasibility of accumulating minimum amounts of the materials and finding a place to store them. Within the larger North Carolina brewery community, we proposed and participated on a panel discussing initial steps that craft brewers across the state can take to become more sustainable. Our staff does periodic clean ups of the storm drains and street behind the brewery, using supplies provided by Keep Durham Beautiful. At the clean up pictured at the left, we picked up 160 pounds of trash and recycling. This prevents it from going down the storm drain and into surrounding bodies of water, including drinking water sources.

Certifications and Awards

- Fullsteam achieved silver standing in the Durham Sustainability Office Bull City Workplace Challenge.
- We also received the Stormwater STAR Business certification "for being a shining example of environmental stewardship in the area of water pollution prevention."
- NC Green Travel recognized Fullsteam in March of 2018.
- We maintained our standing as a Durham Living Wage employer.



Future Aspirations

Though we increased our barrelage 40% from 2016 to 2017, we're close to capacity. Thus, we expect our beer production in 2018 to approximate 2017's. We will, however, expand our kitchen and possibly add some climate control in the tavern.

With that in mind, our goal is to reduce energy consumption (from non-renewable energy sources) by 5% per barrel brewed through continued staff education, as well as an audit of our boiler and nature gas use. We're also exploring the feasibility of solar energy, which would help exceed this goal.

Over the coming year, we aim to reduce water consumption by 10% per barrel brewed by reusing close to 100% of our knock-out water for cleaning and brewing. Because we'll need less natural gas to heat the water, this change will also lower our gas consumption.

For solid waste, our goal is to reduce missortings by 30%. We are also going to continue to investigate recycling plastic films in collaboration with fellow breweries and with the help of the North Carolina Department of Environmental Quality.

Our transportation goals include revisiting our tavern bike parking options and a retrofitting of our oldest delivery vehicle.



New Leadership

In April of 2018, Amanda Richardson, the founder of the Fullsteam's Green Team, departed for a colder climate. Although we're sad to see Amanda move on, we're thrilled that Fullsteam's new lead brewer, Daniel Pearce, will resume the role of Fullsteam's Sustainability Leader. Daniel's primary goal will be to focus on the goals outlined above, allowing Fullsteam to become even more sustainable as we grow.