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BREWING A GREENER FUTURE

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The coronavirus pandemic has turned the entire world upside down. The global hospitality and travel industries are on their knees while sectors like e-commerce are booming. And yet, while much has changed, the wellbeing of our dear earth is just as paramount today as it was pre-COVID. Indeed, the modern consumer's concern for the earth's wellbeing is increasingly informing their purchasing behaviour.

A recent report by Mintel shows that brand ethics are important to two thirds of US consumers,¹ and that younger generations are more willing to research brands' practices before they commit to a purchase. On a similar note, UK-based consumer organisation Ethical Consumer highlights the recent phenomenal growth of the 'ethical consumer' market*, which went up from \$14.9bn in 1999 to a whopping \$54.6bn in 2019. Interestingly for brewers, ethical food and drinks remains the largest segment of this market, with an annual spend of \$16bn.²

Moreover, greener businesses are increasingly more attractive to investors, too. The US Forum for Sustainable and Responsible Investment claims that the size of the country's sustainable and responsible investment universe has skyrocketed over the past few years, with the most recent figures (2020) hitting \$17.1 trillion, a remarkable increase from 2018's \$12 trillion and 1995's 'mere' \$639 billion.³

In response to fast-changing consumer dynamics, the world's largest beer producers have been upping their sustainability game by adopting a holistic approach to responsible brewing and implementing sustainability programmes that encompass the entire supply chain, as well as the social and economic implications of their business.

From plastic to water

For some global brands', the most intriguing 'sustainable' innovations have come in the form of new, environment-friendly packaging. Solutions to get rid of plastic rings range from simple cardboard toppers, to AB Inbev-owned Corona's stackable cans, or Carlsberg's innovative recyclable glue which holds cans together. But green innovation means new containers, too. Last year, Carlsberg made the headlines for its praiseworthy paper bottle project. The brewing giant is currently working on two prototypes and claims that the final bottle will be fully biodegradable and fully recyclable, made from wood fibres and have a waterproof inner barrier, either made with a PET polymer or a bio-based PEF.

Meanwhile, due to their very nature, small- or medium-sized breweries have often only limited capital and human resources available for sustainable development. Indeed, building a comprehensive sustainable programme isn't always practical nor financially viable. However, taking the steps to improve sustainability doesn't necessarily need to cost a fortune, and it might even unveil an unexpected return on investment.

But what are the best approaches and immediate solutions for brewers to reduce their environmental impacts and appeal to the growing green-conscious consumer segment while remaining competitive?

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Rethink waste

One simple solution to become more sustainable is to be mindful about waste. From water to energy consumption, and from paper towels to spent grain, it's more straightforward than it sounds to improve green credentials by cutting down on waste.

Many breweries are already trying to reduce their water-to-beer ratio. A means to do this is by designing a smart incoming water treatment process that produces the right water chemistry for the beer style(s) that will be brewed, while minimizing the amount of treatment needed (e.g. reverse osmosis, although effective, is an energy and water intensive technology). Another option is that of reusing some of the water. A couple of examples of these efforts include, California's Bear Republic which reuses 25% of its cleaning water thanks to its on-site bio-electrically enhanced wastewater pre-treatment plant; while Canada's Village Brewery uses treated wastewater for brewing. Others, like Pizza Port Brewing Company, in Carlsbad, California, have focused on how to better ways to deal with the various effluents or streams of waste that can impact the BOD and TSS load of the wastewater generated.⁴

"Often, minimizing waste leads to improved yield and productivity" says Dr. Hugo Patiño, Director of Technical Services at First Key Consulting. "Examples include the recovery of wort from the trub pile in the whirlpool, or the recovery of beer from spent yeast. Likewise, optimized packaging line scheduling can lead to fewer beer changes, and with that, a smaller amount of beer waste created."

As for the energy waste, UK's lower-ABV beer specialist Small Beer captures the heat from the boil into the exact amount of water required for the next brew to reduce its electricity bill.

Other simple precautions to reduce energy and water waste are: shutting down equipment when it's not used and shutting off lighting in areas where it's not required; replacing incandescent bulbs with CFL or LED lamps; and, in general, being on top of any cleaning, repairing or replacing that might be required (a simple leaky valve can waste large volumes of fresh water).

Last but not least, whatever means are chosen to reduce waste, remember it's crucial to meter and audit water and energy use in the brewery in order to improve results. Metering can help to identify where water or energy is being wasted, or energy and water-intensive processes which might simply benefit from a rethink.

Rethink supply chain

But don't just think inside the walls of the brewery. Choosing a greener packaging supplier or packaging solution, or perhaps a low-carbon footprint delivery service are also options.

Iconic Scottish craft brewery BrewDog for instance, is working with integrated transportation ecosystem brand Arrival to replace all of its fossil fuel delivery trucks with fully electric ones.

Being mindful when choosing ingredients can also make a significant difference. Sustainably grown hops and malt can go a long way to earning green credentials, and so will sourcing locally grown supplies wherever possible. Highly aromatic American hops are in huge demand across the globe, being the ideal ingredient for hop-forward pale ales. Their carbon footprint however, will vary considerably according to location. Washington State brewers are fortunate enough to have plenty next door, while Europeans need to ship them from across the Atlantic. Perhaps bittering hops could be a more local alternative, if any is available. And using hops products that are more shelf-stable (e.g. extracts instead of cone hops) can lead to lower losses and thus a smaller amount of hops used in total. The use of better technologies to add hops for dry hopping can lower the amount of hops needed to achieve the same great flavour and aroma. Innovative work is underway studying the reuse of spent hops used in dry hopping.⁵

The same point can be made in relation to the rising popularity of adjuncts in beer. Are the coffee beans, vanilla pods, mangoes, or guavas ethically farmed? How much have they travelled to get here? Are they really needed? Ask these questions before planning the next experiment: market demand is obviously paramount for the viability of any business, but brewers should always seek to reach a balance between commercial needs and the ethical implications of each beer produced. Once again, a local alternative might turn out to be cheaper and will add a sense of place to the product.

Lastly, with the malting process itself being very water-intensive why not consider experimenting with some unmalted raw materials? There are a number of commercially available enzymes that make the partial substitution of malted barley by unmalted barley a feasible option, for instance.

Rethink community

For many, sustainability has become synonymous with the natural environment. It's important not to forget, an ethical business needs to be acting on a socio-economic level, too. Michigan's Brewery Vivant for instance, donates 1% of their sales to local charities, and invites local non-profit organizations to their venue to collect donations. Indeed, breweries can be virtuous (and many are) by proactively fostering a positive social and economic environment and contributing to the local economy by supporting local enterprises or disadvantaged communities through hiring.

Whether a brewery decides to act on energy waste or on supply chain, adopting a more ethical approach to brewing by implementing any of these simple solutions is certainly set to pay dividends in the future.

Considering next steps?

This article has outlined some good reasons and means for brewers to improve their sustainability. But, what kinds of challenges might a brewery face? Upslope Brewing Company, in Boulder, Colorado, shared their story⁶ and the challenges that they faced and continue to face in this journey of improved sustainability, such as: a) the use of benchmarking (one good resource being the five-year study⁷ and a tool⁸ made available by the Brewers Association), b) setting and meeting goals (which involves balancing priorities, and designating some of these as key performance indicators or KPIs), and c) employee engagement (as people's buy-in is key). At First Key, we can help you with this process and get your brewery on track to a greener and more sustainably profitable future.

By Dr. Jacopo Mazzeo

[1] Mintel, Attitudes Toward Brand Ethics US, January 2020.

[2] Ethical Consumer, Markets Report 2019.

[3] US Sustainable and Responsible Investment Foundation, Trends Report 2020.

[4] A. R. Spevacek and E. J. Ritchson, "The Effect of Waste Side-Streaming on Brewery Effluent Strength", MBAA TQ vol. 57, no. 4 · 2020 · pp. 213–217

[5] O. Oladokun et. al. "Characterisation of spent hop slurry from different dry hopping processes and their potential application in the brewhouse", MBAA Calgary Conference, 2019.

[6] E. Waters, "Lessons Learned Implementing a Sustainability Program in a Craft Brewery", MBAA TQ vol. 57, no. 4 · 2020 · pp. 206–208.

[7] Brewers Association 2014 -2018 Sustainability Benchmarking

[8] Brewers Association: <https://www.brewersassociation.org/educational-publications/sustainability-benchmarking-tool/>

*Defined as personal allocation of funds, including consumption and investment, where choice has been informed by a particular issue – be it human rights, social justice, the environment or animal welfare.