Qualifying Explanatory Statement According to PAS 2060:2014

Achievement of and Commitment to Product Carbon Neutrality for Fat Tire® Amber Ale

Prepared for:
New Belgium Brewing Company

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1.0 Introduction

New Belgium Brewing Company (New Belgium), maker of Fat Tire® Amber Ale (Fat Tire®) and many other beers, is a leading craft brewing company headquartered in Fort Collins, Colorado with breweries in Fort Collins, Colorado and Asheville, North Carolina. Founded in 1991, New Belgium is an early leader in corporate sustainability, having commissioned the first carbon footprint study for beer in 2007, focused on a 6-pack of Fat Tire®. In 2022 the company purchased Bell's Brewery and has more than 1,300 employees nationwide. The combined company is owned by Lion Little World, a subsidiary of Kirin Holdings

Since its founding, New Belgium has included environmental stewardship as a core value and key aim. As the effects of climate change are starting to appear in the supply chain and general marketplace, accelerating carbon neutral goals is a top priority for New Belgium. Voluntary commitments include: (1) carbon neutral certification for all beers by 2030, (2) sourcing 100% renewable electricity by 2030 or sooner (under Kirin and listed in RE100), and (3) an absolute reduction in GHG emissions in alignment with the Science Based Targets Initiative limiting warming to 1.5° C (under Kirin listed in the SBTI registry).

This document forms the PAS 2060 Qualifying Explanatory Statement to demonstrate that Fat Tire® Amber Ale products have achieved carbon neutrality in accordance with PAS 2060:2014 on January 1, 2021 for calendar year 2021, with commitment to maintain carbon neutrality through December 31, 2022. All information provided within this report has been reviewed and certified by a third party.

This document will be updated at least every 12 months to reflect New Belgium's status toward its carbon neutrality targets. The report is publicly available at www.newbelgium.com

2.0 Declaration of commitment to carbon neutrality

New Belgium is fully committed to achieving carbon neutrality for our Fat Tire® product line, in all formats as of 2019 and to maintain this commitment through 2022. We are pleased to have reached this goal through a variety of high-impact carbon offset projects, as documented and independently certified below.

PAS 2060: 2014 Other Party Validation Requirement	Response
Individual responsible:	Katie Wallace, Chief Environmental Social and Governance Officer
Entity making declaration:	New Belgium Brewing Company
Subject of PAS 2060 declaration:	Fat Tire® Amber Ale
Description of subject:	See Table 2
Function of Subject:	Serve as an alcoholic beverage
Rationale for selection of the subject:	The scope and subject of this PAS 2060 includes entire product life cycle emissions including the following: (i) raw material extraction and processing (ii) production and packaging and (iii) product distribution, retail and consumption and (iv) end-of-life.
Boundaries of the subject	The scope and subject of this PAS 2060 includes entire product life cycle emissions including the following: (i) raw material extraction and processing (ii) production and packaging and (iii) product distribution, retail and consumption and (iv) end-of-life.
What type of conformity assessment has been undertaken?	OPV-3: Other party validation- unified (achievement and commitment)
Confirmation that methodology was applied in conformance with PAS 2060:2014	The application of the methodology conforms to principles set out in clause 6.1.2 of PAS 2060:2014.
Baseline period for PAS 2060: 2014 program:	1st January 2019- 31st December 2019
Achievement period:	1st January 2021- 31st December 2021
Commitment period:	1st January 2022- 31st December 2022
Standard for assessment of GHG emissions	GHG Protocol Product Life Cycle Accounting and Reporting Standard; The Beverage Industry Greenhouse Gas Emissions Sector Guidance.
Justification of assessment method	The methodology prescribed in the guidelines aligns with WRI's Product Life Cycle Accounting and Report Standard, meets PAS 2060 requirements, and is specific to the product sector.
Product Carbon Footprint Results	See Table 3A in Section 3 Fat Tire® 2021 Carbon Footprint
Executive Signature: Katie Wallace Chief ESG Officer	

3.0 Fat Tire® Amber Ale Carbon Footprint

3.1 Introduction

The foundation of a carbon neutral certification is a full lifecycle carbon footprint analysis. This section describes the carbon footprint for Fat Tire® for calendar year 2021. Analysis of the carbon footprint allows prioritization of key action areas for greenhouse gas emissions reduction in both the short term and long term.

The terms "carbon emissions" and "greenhouse gas (GHG) emissions" are used interchangeably throughout the report.

3.2 Methodology

The methodology for the product carbon footprint accounting followed WRI GHG Protocol Product Standard[1], in conformance with the requirements of PAS 2060:2014[2]. The Beverage Industry Environmental Roundtable (BIER) Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance[3] was also instrumental in guiding the modeling of greenhouse gas emissions. The system boundary and calculation methodology for product carbon footprints were based on the BIER guidance[4]. The methodology for quantifying product footprints in the underlying assessment meets the accounting requirements and the publication of this document on the New Belgium website meets the communication requirements of WRI's Product Life Cycle Accounting and Report Standard a GHG assessment standard approved by PAS 2060:2014[5].

The assessment includes GHG emissions across the product life cycle for the following phases: (i) raw material extraction and processing, (ii) production and packaging, and (iii) product distribution, retail and consumption and (iv) end-of-life. These calculations were made and reported prior to the purchase of any carbon offsets by New Belgium.

The Scope 1-3 categorization of the WRI GHG Protocol does not apply to product carbon footprints. This PCF takes into account all emissions, direct and indirect, with the exception of those related to exclusions, see section 3.4.6, across the product life cycle.

The Fat Tire ® carbon footprint was verified by James Salazar, an independent LCA expert from Coldstream Consulting[6].

Table 2. *General information and scope of the PCF.*

Product Assessed	Fat Tire® Amber Ale
Product Description	Fat Tire® Amber is an easy-drinking Amber Ale Visual: Clear, amber and bright with white lacing. Flavor: Toasty malt, gentle sweetness, flash of fresh hop bitterness. The malt and hops are perfectly balanced. Aroma: Sweet biscuity and caramel malts, subtle notes of fresh fennel and green apple. Mouthfeel: Carbonation and light sweetness finish clean on your palate. Medium body. ABV: 5.2% IBU: 22

[1] Greenhouse Gas Protocol. Product Life Cycle Accounting and Reporting Standard. World Resources Institute, and World Business Council for Sustainable Development. 2013.

[2] The British Standards Institution. (2014). PAS 2060:2014: Specification for the demonstration of carbon neutrality.

[3] Beverage Industry Environmental Roundtable (BIER). (2019) "Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance."

[4] Beverage Industry Environmental Roundtable (BIER) (2018). "The Beverage Industry Greenhouse Gas Emissions Sector Guidance. Version 4.0" https://www.bieroundtable.com/publication/greenhouse-gas-emissions-sector-guidance/

[5] See Appendix A in WRI's Product Life Cycle Accounting and Report Standard.

[6] http://www.coldstreamconsulting.com/

Unit of Analysis	12-fl oz of beer packaged in different packaging types: 12-fl oz glass bottle 12-fl oz aluminum can 16-fl oz aluminum can 1 standard size keg (15.5 U.S. gallons - for commercial consumption) 1 slim keg (1/6 bbl or 5.17 US gallons – also for commercial consumption)
Reference Flow	12-fl oz (355 mL) of packaged Fat Tire ®
Type of GHG Inventory	Cradle-to-Grave
Time Period	2021, calendar year

Emissions are reported in MT CO_2e, in line with PAS 2060, and includes the emissions of all applicable Kyoto protocol pollutants, namely Carbon Dioxide, Methane, Nitrous Oxide, Sulfur Hexafluoride and refrigerants.

3.2.1 The Product System under Study

New Belgium Fat Tire® Amber Ale is the flagship beer of New Belgium Brewery produced in their brewing facilities located in Fort Collins, Colorado and Asheville, North Carolina. The product system was modeled based on primary data and information provided by New Belgium. The study included several key data requirements:

- Purchased material inputs to Fat Tire®,
- Material weights per product for primary packaging,
- Scrap generated during the packaging process for fiberboard and corrugated packaging,
- Transportation data for Fat Tire® raw materials,
- Primary data for New Belgium operations, including energy use and waste generation,
- Primary data on product distribution,

Representative inventory data for many unit processes was selected using secondary data from the Ecoinvent[7] life cycle database with a prioritization for data with the highest degree of representativeness of the actual material or process.

Life cycle modeling of Fat Tire® was divided into the following distinct life cycle phases:

- Material acquisition and pre-processing: This stage begins with agricultural production of the main ingredients, barley and hops. Barley production has been found to be a major contributor to the carbon footprint of beer in previous PCFs[8], by requiring the use of seed production, irrigation, agricultural machinery, pesticide and herbicide use and production and tillage. Once barley has been harvested it is

[7] Ecoinvent Centre (2018) Ecoinvent data from v3.5. Swiss Center for Life Cycle Inventories, Dübendorf, 2017 http://www.Ecoinvent.org

[8] State of Oregon Department of Environmental Quality (2017). *Food Product Environmental Footprint Literature Summary: Beer.* https://www.oregon.gov/deq/FilterDocs/PEF-Beer-FullReport.pdf

transferred to a malting facility where it is germinated and dried to produce malt, a process that requires water and energy. This stage includes GHG impacts associated with the transportation of these material inputs to the facilities in Fort Collins, CO and Asheville, NC, and ends when the product components enter the gate of the respective production facilities. Additionally, included in this stage is the extraction of resources from nature for production components and packaging materials. Packaging has also been found to be a significant contributor to the overall product carbon footprint[9], depending upon the material used. Purchased CO_2 transportation is included in the scope, but the production of CO_2 is excluded as per the BIER guidelines because of the particular CO_2 is a byproduct of a biogenic process.

- Production: The production stage begins when the product components enter the breweries and ends when the packaged beverage leaves the production gate for distribution. The functional unit is the packaged beer. It includes GHG emissions from energy use and emissions associated with brewing and packaging of the finished Fat Tire® products, as well as the management of wastes produced.

- Product Distribution and Retail: This stage begins when the finished product leaves the gate of the Fort Collins or Asheville breweries and ends with retail. It represents the greenhouse gas emissions associated with transport of the finished product from the breweries to various distributors. The retail modeling includes the hotel load, or the proportion of building lighting and energy allocated to the product, and cooling, the use of energy required to control the temperature of the product before purchase.

- Product Use: The use stage includes the transportation from retailer to consumer and cooling while in consumer storage prior to consumption. Note - the hotel load for on-premise consumption is included in the Product Distribution and Retail stage.

- End-of-Life: This stage includes greenhouse gas emissions from transport of product packaging to waste treatment facilities and from waste treatment activities, landfill or incineration, from product packaging. Recycling processes are not included due to the recycled content cut-off assumption. For on-premise consumption, kegs are collected and may be reused 100 times or more. Previous studies have modeled keg re-use 70 times[6]. New Belgium notes that their kegs are re-used hundreds of times but unable to measure the number with certainty.

3.2.2 Allocation Procedures

Allocation is required when a single product system produces more than one product. Allocation addresses the problem of how to divide resource use, energy use and emissions between multiple products produced at the same production facility. Allocation guidelines in ISO 14044, the GHG Protocol Product Standard and PAS 2060, state that wherever possible, the use of allocation should be minimized. However, if allocation is

[9] Cimini and Moresi (2016). *Carbon footprint of a pale lager packed in different formats: assessment and sensitivity analysis based on transparent data*. Journal of Cleaner Production 112: 4196- 4213.

required, ISO 14044 states that mass-based allocation should be used preferentially over economic allocation, and for this reason, a mass-based allocation approach was used where necessary. Mass-based allocation takes a physical approach by partitioning inputs and outputs in the product system, based on relative mass of products and co-products generated.

Primary data for the facilities were obtained from New Belgium. A mass-based allocation method was applied to determine the amount of energy and resource inputs relative to one 12 oz serving of Fat Tire® produced at the Fort Collins and Asheville facilities. The Fort Collins and Asheville facilities brew multiple types of beer, and in cases where the data was available specifically for Fat Tire® production, this data was used. In cases where only facility-level data was available, resource use was allocated to the beers by the proportion of Fat Tire® to total beer production at that facility on a mass basis. The final results for Fat Tire® were calculated based upon a production weighted average of the amount of the respective beers produced at the Fort Collins and Asheville facilities.

The electricity supply mixes for the breweries are modeled using electricity generation mixes provided by the local utilities for each brewery and with ecoinvent datasets. For electricity use at processes downstream of the breweries (e.g., refrigeration), a U.S. average electricity supply mix was used.

Allocation used within the secondary databases utilized for the system is primarily based on physical relationships. Impacts from transportation were allocated based on the mass of material and distance transported.

3.2.3 Cut-off Criteria

All significant inputs and outputs relevant to the Fat Tire® product system were included in the PCF calculations with the exception of some materials which represent less than 1% of total impact. All known materials and processes contributing greater than 1% of the total environmental impact indicator for each impact were included in the life cycle inventory. Notable omissions include yeast, minor brewing additives, and packaging adhesives and shrink wrap.

3.2.4 Carbon Footprint Methodology and Interpretation Used

Greenhouse gas indicators are calculated as the product of the 100-year GWP and the mass of greenhouse emission, summed over all contributing greenhouse gases and for all sources and sinks within the life cycle system boundary for the assessed product. Results are reported in units of grams (g) CO2 eq across the life cycle, as well as by contributing life cycle phase. Greenhouse gas emissions are also summarized separately for fossil and biogenic carbon sources and sinks. Additionally, GHG emissions arising from changes in land use and carbon uptake by soil, are reported. The method of accounting for biogenic CO_2, CO_2 from land use

change, and CO_2 uptake are taken from the GHG Protocol method in openLCA LCIA methods v2.0.3[10] in Ecoinvent. All results are calculated. The IPCC 2021 metrics are used for calculation of results.

3.3 Product lifecycle boundaries

This footprint includes "cradle-to-grave" GHG emissions associated with Fat Tire® in all forms and packaging, brewed at the Fort Collins, Colorado and Asheville, NC facilities. Shown below is a process map for the entire lifecycle of Fat Tire® beer from raw ingredients through final consumption by consumers.

The process map in Figure 1 defines the life cycle stages and illustrates the key processes contributing measurably to category indicator results for the greenhouse gas indicators specified in the GHG Protocol Product Standard. Impacts associated with capital goods (e.g., machinery, trucks, infrastructure), overhead operations (e.g., office lighting), corporate activities (e.g. research and development, travel) are defined as non-attributable processes and are not included in the PCF.

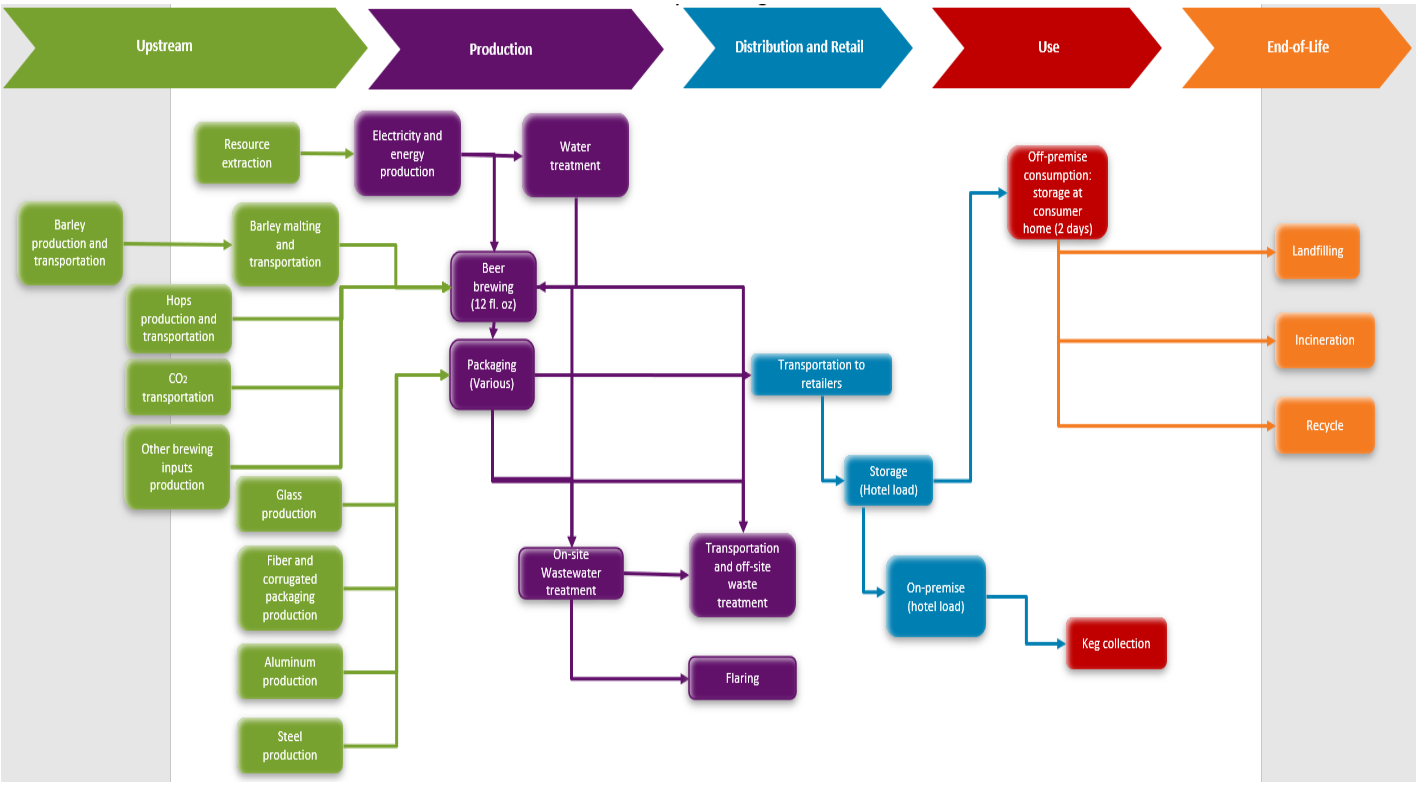


Figure 1. *Process map illustrating the key processing included by life cycle stage of 12-fl oz of Fat Tire® beer.*

[10] openLCA LCIA methods v.2.0.3 https://nexus.openlca.org/database/openLCA%20LCIA%20methods

3.4 Total carbon footprint

The GHG emissions for all Fat Tire® products produced between January 1, 2021 and December 31, 2021 equals 25,356 MT CO2e. Comparing these results to the baseline year (2019) shows on an absolute basis, the GHG emissions for Fat Tire decreased from 35,600 MT CO2e in 2019 to 25,356 MT CO2e in 2021. The number of 12-fl oz services of Fat Tire in 2019 was 90,000,000 compared to 65,871,380 in 2021. Using the total 12-fl oz servings to convert the GHG emissions for 2019 and 2021 to an intensity-based figure, results in .40 Kgs CO2e per 12-fl oz serving in 2019 versus .38 Kgs CO2e per 12 ounce serving in 2021. On an intensity basis, this equates to a 3% decrease in GHG emissions in 2021. Table 3A and 3B summarize the GHG emission results for 2021 and 2019 respectively. Tables 4A through 4E summarize the GHG emissions for 2021 by the individual products.

Table 3A. Summary of cradle-to-grave product carbon for Fat Tire® Amber Ale, and the total Cradle to Grave for Fat Tire® products, as calculated using 2021 packaged data. Calculations done prior to rounding. *Note – annual totals are expressed in metric tons CO2e.*

Product	Cradle-to-Grave per serving (g CO_2e)	Total servings (12-fl oz/ 355mL) by packaged product	Cradle-to-Grave Total 2021) (MT CO2e)	Cradle-to-Grave Total (Kgs CO2e/12-fl oz)
12-fl oz can	281	8,735,973	2,456	-
16-fl oz can	289	867,339	251	-
12-fl oz bottle	425	50,952,384	21,645	-
Standard keg	189	4,642,275	879	-
Slim keg	190	673,409	128	-
TOTAL		**65,871,380**	**25,356**	**.38**

**** Some totals may not add up due to rounding.***

Table 3B. Summary of cradle-to-grave product carbon for Fat Tire® Amber Ale, and the total Cradle to Grave carbon footprint for Fat Tire® products, as calculated using 2019 packaged data. Calculations done prior to rounding. *Note – annual totals are expressed in metric tons CO2e.*

Product	Cradle-to-Grave per serving (g CO_2e)	Total servings (12-fl oz/ 355mL) by packaged product	Cradle-to-Grave Total (2019) (MT CO2e)	Cradle-to-Grave Total (Kgs CO2e/12-fl oz)
12-fl oz can	340	8,100,000	2,700	-
16-fl oz can	330	1,400,000	470	-
12-fl oz bottle	460	58,000,000	27,000	-
22-fl oz bottle	500	250,000	120	-
Standard keg	250	15,000,000	3,800	-
Slim keg	260	5,900,000	1,500	-
TOTAL	-	**90,000,000**	**35,600**	**.40**

**** Some totals may not add up due to rounding.***

Table 4A. Summary of cradle-to-grave product carbon footprint results for 12-fl oz (355 mL) of Fat Tire® in a 12-fl oz aluminum can, calculated using IPCC 2021 metrics.*

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (Packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**281**	**170**	**54.6**	**49.7**	**6.51**	**0.109**
Fossil CO_2 eq	g CO_2 eq	293	185	52.0	49.7	6.51	0.108
Biogenic CO_2 eq	g CO_2 eq	30.3	27.7	2.60	$7.00x10^{-4}$	0.00	0.00117
CO_2 eq from land transformation	g CO_2 eq	0.0146	0.0144	$7.80x10^{-5}$	$8.29x10^{-5}$	0.00	$8.05x10^{-7}$
CO_2 uptake	g CO_2 eq	42.5	42.5	0.0236	$7.66x10^{-4}$	0.00	$2.75x10^{4}$

Table 4B. Summary of cradle-to-grave product carbon footprint results for 12-fl oz (355 mL) of Fat Tire®, packaged in a 16-fl oz aluminum can, calculated using **IPCC 2021** metrics.*

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**289**	**178**	**54.6**	**49.8**	**6.50**	**0.0972**
Fossil CO_2 eq	g CO_2 eq	297	189	52.0	49.8	6.50	0.0964
Biogenic CO_2 eq	g CO_2 eq	24.1	21.5	2.60	$7.00x10^{-4}$	0.00	0.00102
CO_2 eq from land transformation	g CO_2 eq	0.0111	0.0110	$7.80x10^{-5}$	$8.29x10^{-5}$	0.00	$7.28x10^{-7}$
CO_2 uptake	g CO_2 eq	32.4	32.4	0.0236	$7.66x10^{-4}$	0.000	$2.51x10^{-4}$

Table 4C. Summary of cradle-to-grave product carbon footprint results for 12-fl oz (355 mL) of Fat Tire®, packaged in a 12-fl oz glass bottle, calculated using IPCC 2021 metrics.*

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**425**	**309**	**54.6**	**53.1**	**7.21**	**1.54**
Fossil CO_2 eq	g CO_2 eq	452	338	52.0	53.1	7.21	1.53
Biogenic CO_2 eq	g CO_2 eq	51.2	48.6	2.60	$7.00x10^{-4}$	0.00	0.0154
CO_2 eq from land transformation	g CO_2 eq	0.0235	0.0233	$7.80x10^{-5}$	$8.29x10^{-5}$	0.00	$1.19x10^{-5}$
CO_2 uptake	g CO_2 eq	78.4	78.4	0.0236	$7.66x10^{-4}$	0.000	0.00415

Table 4D. Summary of cradle-to-grave product carbon footprint results for 12-fl oz (355 mL) of Fat Tire®, packaged in a keg (1/2 bbl), calculated using IPCC 2021 metrics.*

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**189**	**72.0**	**54.6**	**62.7**	**0.00**	**$8.00x10^{-3}$**
Fossil CO_2 eq	g CO_2 eq	186	71.7	52.0	62.7	0.00	$7.96x10^{-3}$
Biogenic CO_2 eq	g CO_2 eq	3.04	0.441	2.60	$7.00x10^{-4}$	0.00	$6.46x10^{-5}$

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
CO_2 eq from land transformation	g CO_2 eq	$5.34x10^{-3}$	$5.18x10^{-3}$	$7.80x10^{-5}$	$8.29x10^{-5}$	0.00	$6.96x10^{-8}$
CO_2 uptake	g CO_2 eq	0.0736	0.0492	0.0236	$7.66x10^{-4}$	0.000	$2.57x10^{-5}$

Table 4E. Summary of cradle-to-grave product carbon footprint results for 12-fl oz (355 mL) of Fat Tire®, packaged in a slim keg (1/6 bbl), calculated using IPCC 2021 metrics.*

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**190**	**72.6**	**54.6**	**62.7**	**0.00**	**0.00507**
Fossil CO_2 eq	g CO_2 eq	187	72.2	52.0	62.7	0.00	0.00505
Biogenic CO_2 eq	g CO_2 eq	3.05	0.457	2.60	$7.00x10^{-4}$	0.00	$4.10x10^{-5}$
CO_2 eq from land transformation	g CO_2 eq	$5.34x10^{-3}$	$5.18x10^{-3}$	$7.80x10^{-5}$	$8.29x10^{-5}$	0.00	$4.41x10^{-8}$
CO_2 uptake	g CO_2 eq	0.0882	0.0638	0.0236	$7.66x10^{-4}$	0.000	$1.63x10^{-5}$

Results are rounded to three or more significant figures. Some totals may not add up due to rounding.

3.4.1 Upstream Emissions

The processes covered in the Upstream Materials life cycle phase include both cultivation of ingredients and raw material processing for the agricultural products, transportation of raw materials and transportation from material processing sites to New Belgium breweries, and the production and transportation of packaging materials. Barley cultivation consists of the seed production, irrigation, fertilizer and pesticide use, soil emissions, and agricultural machinery for agricultural products. Raw material processing consists of barley malting and transportation from the malting facility or distribution center to New Belgium breweries. Carbon dioxide is purchased as a byproduct from a fertilizer producer and used to barrier between the beer and oxygen all throughout the process except for fermentation. It is also used to push draft beer from the keg to the tap.

Other minor components of the manufacturing process, such as yeast, and other ingredients were used in small amounts, and assumed to contribute less than 1% of environmental impact and no more than 5% when summed together.

3.4.2 Production Emissions

Included in manufacturing life cycle stage are emissions related to processes which occur at New Belgium Breweries for Fat Tire®, packaging, energy use, and manufacturing waste treatment, and allocated to Fat Tire® products by volume, including (a) electricity use at New Belgium breweries, (b) fugitive emissions at

the breweries, including the purchased CO_2 purged from tanks and refrigerant leakage, (c) natural gas used to run boilers at the breweries, and (d) flaring of methane-rich biogas from the onsite process water treatment plants in Fort Collins, Colorado and Asheville, North Carolina, (e) the transportation of recycled, composted, byproduct and landfilled manufacturing waste, as well as the emissions from landfilling manufacturing waste. See Section 4 on the plans to mitigate and offset these emissions.

- *Natural gas combustion.* Data calculated based on natural gas purchases for Fort Collins and Asheville breweries. Includes natural gas used at all buildings at both locations (FTC: Main brewery, PWTP, Distribution Center; AVL: Main Brewery, Distribution Center and PWTP). The natural gas for facilities outside of the brewing scope is assumed to be insignificant.

- *Flaring,* from biogas produced during anaerobic digestion of organic manufacturing wastes. Data calculated by New Belgium using the flow rate of flaring and amount of time flaring took place. The methane content of the biogas was determined to be 75.3% by New Belgium in previous analyses, and the flaring efficiency was 98% and 99% for FTC and AVL, respectively, based upon GHG Protocol Documentation and the Manufacturer specifications.

- *Fugitive emissions,* calculated from charged refrigerant purchases, and calculated CO2 losses while assisting beer pushing.

- *Purchased electricity,* for the Fort Collins, Colorado and Asheville, North Carolina breweries equivalent to the Fat Tire® reference flow, calculated from monthly meter readings. See Section 4 on the plans to mitigate and offset these emissions.

- *Manufacturing wastes*, which includes consideration of transportation for recycling, transportation to and emissions from landfilling, and transportation and emissions from composting of wastes generated at the breweries. Transportation of recycling and wastes were included, based upon an assumed average 20-mile distance by truck to waste treatment as estimated for the EPA Warm model[11].

- *Manufacturing byproducts*, Transportation for three manufacturing byproducts: spent grains which are sold to agricultural applications, spent yeast which are also sold; and land-applied sludge produced as a byproduct of anaerobic digestion.

[11] "*WARM Model Transportation Research - Draft*." Memorandum from ICF Consulting to United States Environmental Protection Agency. September 7, 2004.
http://epa.gov/epawaste/conserve/tools/warm/SWMGHGreport.html#background.

3.4.3 Distribution Emissions

Fat Tire® is produced in Fort Collins, CO and Asheville, NC and is shipped across North America by truck, and shipped internationally. A small amount of product is transferred between Fort Collins and Asheville, as needed. Distribution is based upon the assumption that 95 beer barrels (bbls), or approximately 2,950 gallons, are contained in a shipment, an assumption made by New Belgium. Product is shipped domestically by truck transport, and approximately 1.2% of all Fat Tire® is shipped internationally by marine transport.

3.4.4 Retail and Product Use Emissions

Products are sold from third parties for consumption on or off-premise. On-premise consumption refers to the hotel load and cooling of kegs for draught beer at hotels, bars, restaurants, etc. Off-premise consumption refers to the hotel load and cooling required for bottles and cans at a liquor store, convenience store, or supermarket and final consumption by the consumer at home. Retail scenarios are based on input from the manufacturer and BIER documentation guidelines[12,13]. Assumptions about the average electricity use and average retail size are based on the EIA Consumer Building Energy Consumption Survey (CBECS). The breakdown of product sold at convenience stores and larger, supermarket-type retailers is taken from primary data obtained from NBB.

Once consumers arrive at home with their product, additional refrigeration and energy are often required prior to final consumption. Assumptions and calculations for at-home refrigeration are based on the BIER documentation. Emissions from electricity used for both on-premise and off-premise retail and use are based upon the national average electricity supply mix derived from eGRID because Fat Tire® is purchased and consumed throughout the US. It is assumed that retail and product use in international locations is significantly similar to that in the US given that much of consumption is in European and OECD countries, and international consumption consists of 1.2% of total consumption.

3.4.5 End-of-Life Emissions

At end-of-life the packaging materials are disposed of. No specific data are available regarding the specific waste processing of Fat Tire® packaging materials. It is assumed that after consumption, the packaging materials are transported to a waste treatment facility. The type of waste treatment, by packaging material type, is taken from the US Environmental Protection Agency[14] data for packaging materials.

[12] Beverage Industry Environmental Roundtable (BIER). (2019) “Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance.”
[13] Beverage Industry Environmental Roundtable (BIER). (2012) "Research on the Carbon Footprint of Beer.”
[14] US Environmental Protection Agency. 2020. “Advancing Sustainable Materials Management: 2018 Fact Sheet.” https://www.epa.gov/sites/production/files/2019-11/documents/2017_facts_and_figures_fact_sheet_final.pdf

Table 5. Assumed management for Fat Tire® packaging materials at end of life by material type.

Packaging	Landfilled	Incinerated	Recycled
Glass	55%	13%	31%
Aluminum	52%	13%	35%
Fiberboard	15%	4%	81%
Steel	21%	5%	74%

Transportation at end of life assumes a 20-mile average distance to disposal, consistent with assumptions used in the US EPA WARM model[15].

3.4.6 Exclusions

All significant inputs and outputs relevant to the Fat Tire® product system are included in the product carbon footprint calculations with the exception of some materials which represent less than 1% of total impact. All known materials and processes contributing greater than 1% of the total environmental impact indicator for each impact were included in the life cycle inventory. Notable omissions of less than 1% of total impact include yeast, minor brewing ingredients, packaging adhesives, and shrink wrap.

4.0 Fat Tire® Amber Ale Carbon Management Plan

4.1 Introduction

New Belgium Brewing Company, maker of Fat Tire® Amber Ale (Fat Tire®), Mountain Time® Lager and a host of other brands is headquartered in Fort Collins, Colorado with an east coast brewery in Asheville, NC. Since its founding in 1991, New Belgium has been a leader in sustainability, becoming the first wind-powered brewery in 1999, commissioning the first carbon footprint study for a beer in 2008 and becoming the first craft brewer in the United States to achieve carbon neutral certification in 2019 for its flagship beer, Fat Tire®. In 2022 the company purchased Bell's Brewery and has more than 1,300 coworkers nationwide. The combined company is owned by Lion Little World, a subsidiary of Kirin Holdings.

For over 30 years, New Belgium has prioritized environmental stewardship as a core value and key aim. With the effects of climate change already impacting the craft brewing supply chain and being felt across the globe, accelerating action to avert the worst impacts is a top priority for New Belgium. Voluntary commitments include (1) carbon neutral certification for all beers by 2030, (2) sourcing 100% renewable electricity by 2030 (under our parent company Kirin listed in RE100), and (3) absolute reduction in GHG

[15] "*WARM Model Transportation Research - Draft*." Memorandum from ICF Consulting to United States Environmental Protection Agency. September 7, 2004. http://epa.gov/epawaste/conserve/tools/warm/SWMGHGreport.html#background.

emissions in alignment with the Science-Based Targets Initiative, limiting warming to 1.5 Celsius. A 55% reduction in Scopes 1-2, 30% reduction in Scope 3 (under our parent company Kirin listed in the SBTi registry).

This document will be updated at least every 12 months to reflect New Belgium's status toward its carbon neutrality targets. The report is publicly available at www.newbelgium.com

4.2 Fat Tire® Amber Ale base year carbon footprint

The carbon footprint as described in section 3 used primary data from calendar year 2021 as the baseline for this carbon neutral achievement and commitment.

4.3 Historic and ongoing reduction in emissions

For 30+ years New Belgium has been targeting resource conservation and GHG emissions reductions. Beginning in the original basement brewhouse the company's cofounder rigged a rudimentary heat exchanger onto the kettle capturing and reusing heat energy from the boil. In the 1990s and with every expansion, energy efficiency was designed into buildings and multiple heat capture and reuse technologies were implemented wherever possible. In 1999, coworkers offered up annual profit sharing to help bring wind power to the City of Fort Collins, making New Belgium the first wind-powered brewery in the United States. In the 2000s, a project to light-weight glass bottles reduced emissions from the production and shipping of these containers. Eliminating cardboard dividers in 12-packs has also saved both weight and space on trucks. The Fort Collins, CO brewery has achieved platinum-level certification by TRUE Zero Waste and the Asheville, NC brewery is pursuing this certification in 2022. In 2002 an onsite process water treatment plant began capturing methane-rich biogas and the addition of combined heat and power (CHP) engines converts the biogas to electricity helping power brewing operations. With a recent upgrade, our 500 KW CHP engine is producing roughly 1,000,000 KWs per year and about 2 million gallons of heated brewing water from waste heat. In the 2010s, New Belgium installed – what was at the time – the largest privately-owned solar array in Colorado. In 2011, company sales reps moved to 100% electric vehicles and hybrid delivery trucks. Onsite charging stations are available for both coworkers and guests. Instead of locating our large-scale expansion at our current site in Colorado, we chose North Carolina to reduce the emissions from cross-country shipping. The buildings on this new campus are all LEED-certified at Silver, Gold, or Platinum levels. In 2022 the Asheville brewery installed a 446 KW solar array estimated to produced 620,000 kWh of electricity annually. The new solar array along with several other capital expenditures representing $1+ million in investments will reduce CO_2e emissions by an estimated 700 metric tons/year.

To drive GHG reductions in our value chain, New Belgium's philanthropy program has provided grants to barley breeders to support the development of more climate-friendly and climate-resilient barley varieties. In 2015 we co-founded the Glass Recycling Coalition, a value-chain-led organization that seeks to improve glass recycling in the United States, a necessary step in reducing GHG emissions from glass bottles. Partially as a result of our efforts in 2018, the City Council in Fort Collins adopted its own 100% renewable electricity by 2030 goal. As we're certain 100% renewable electricity is most efficiently achieved at scale, New Belgium is active in policy advocacy at local, state, and national levels. In 2020 we brewed Torched Earth Ale to demonstrate what the future of beer could taste like if climate change continues unchecked. We followed this up by publishing the entirety of our carbon neutral blueprint for businesses to help others take action to reduce their GHG emissions and join us on the road to carbon neutrality (drinksustainably.com).

Each of the initiatives listed above and more are ongoing at New Belgium targeting emissions reductions related to Fat Tire® Mountain Time® and every other beer we brew.

4.4 Future emissions reduction plan

We've allocated over $3 million for capital expenditures in 2023 to be used in decarbonizing our breweries. We'll add systems to capture fermentative CO_2 for reuse, invest in renewables, and increase operational efficiencies while we continue to evaluate emerging technologies and low to no carbon energy sources.

As 86% of New Belgium's annual GHG emissions are a result of upstream and downstream activities, i.e., non-manufacturing related emissions, we also recognize a need to reduce emissions within our value chain. In 2022 New Belgium launched a Sustainable Supplier Program aimed at helping suppliers reduce emissions related to our top three sources. One element of the program is an interactive supplier portal providing guidance and resources to help suppliers decarbonize. Through the portal suppliers will provide annual plant-level emissions data for the facilities that supply our breweries, increasing our understanding of New Belgium's Scope 3 impact and helping demonstrate progress on our decarbonization goals.

Carbon neutral certification for Fat Tire® and Mountain Time® in 2021 has been achieved through historical GHG reductions and the purchase of carbon offsets and will be followed by a continued effort to reduce actual GHG emissions throughout the lifecycle of these and other beers.

4.5 The use of carbon offsets

For unavoidable GHG emissions with the lifecycle of Fat Tire®**,** New Belgium will purchase carbon offsets to satisfy requirements for carbon neutral certification. The credits will be sourced from projects that meet the following criteria: 1) create genuine, additional reductions in GHG emissions free of double-counting, (2) ensure a high level of confidence in permanence, (3) avoid and fully account for leakage and error, (4)

verified by an independent, certified third party verifier, (5) issued after the emission reduction has taken place, (6) meet nationally recognized standards established by credible organizations and stored and retired within their registries with publicly available documentation, (7) align with our source of emissions and value chain.

5.0 Declaration of achievement of carbon neutrality for 2021

PAS 2060: 2014 Other Party Validation Requirement	Response
Achievement period	1st January 2021- 31st December 2021
Carbon footprint of the subject during the achievement period	.38 Kgs CO_2e per 12-fl oz serving (intensity basis)
Means by which reductions have been achieved	Carbon offsetting
Standard and methodology used to achieve carbon offset	See Section 6.
Carbon offsetting information required to comply with clause 9.1.2	See Section 6
What type of conformity assessment has been undertaken?	OPV-3: Other party validation- unified (achievement and commitment)
Achievement period:	1st January 2021- 31st December 2021
Standard for assessment of GHG emissions	The Beverage Industry Greenhouse Gas Emissions Sector Guidance. The methodology prescribed in the guidelines aligns with WRI's Product Life Cycle Accounting and Report Standard.
Date	
Executive Signature: Katie Wallace Chief ESG Officer	

6.0 Carbon offsetting

Carbon offsets equivalent to 25,356 MT CO_2e have been purchased from the following projects to achieve carbon neutral certification for Fat Tire® for the calendar year of 2021. Note that the total number of offsets purchased by New Belgium Brewing exceeds the product carbon footprint of the subject during the achievement period.

Project 1
Project Title and ID Number: Hudson Technologies HFC Reclamation Project Champaign 2020; ACR-US-629-2020-1368-268587 to 290982
Country: United States
Project Type: Industrial Process Emissions

Project Standard: American Carbon Registry
Methodology Used: Use of Certified Reclaimed HFC Refrigerants
Vintage: 2020
Project documentation database link:
https://acr2.apx.com/mymodule/rpt/CertificateInfo.asp?rhid=7562&ftType=PRO&r=206&ad=Prpt&act=update&type=PRO&aProj=icrt&tablename=doc
Alignment with New Belgium selection criteria: Supporting recovery and reuse of HFC refrigerants used in refrigeration of beer.

Project 2
Project Title and ID Number: Indigo U.S. Project No. 1; CAR-1-US-1459-47-1002-MA-2019-6949-2901 to 5900 and CAR-1-US-1459-47-1002-MA-2020-6947-3001 to 5000
Country: United States
Project Type: Soil Enrichment
Project Standard: Climate Action Reserve
Methodology Used: U.S. Soil Enrichment Protocol V 1.0
Vintage: 2019 & 2020
Project documentation database link:
https://thereserve2.apx.com/mymodule/rpt/CertificateInfo.asp?rhid=12529&ftType=PRO&r=206&ad=Prpt&act=update&type=PRO&aProj=icrt&tablename=doc and
https://thereserve2.apx.com/mymodule/rpt/CertificateInfo.asp?rhid=12530&ftType=PRO&r=206&ad=Prpt&act=update&type=PRO&aProj=icrt&tablename=doc
Alignment with New Belgium selection criteria: Supporting sequestration of emissions related to fugitive emissions, transportation, and fiber packaging.

Appendix A: Secondary Data and Emissions Factors

Component	Dataset/ Emission Factor	Source	Publication Date
FAT TIRE and MOUNTAIN TIME			
Barley	barley production | barley grain | Cutoff, U	Ecoinvent v3.7.1	2021
Malt	Malting emissions per serving	BIER Carbon Footprint[16]	2012
Hops	Hops production per serving	BIER Carbon Footprint	2012
PACKAGING			
Glass	packaging glass production, brown, without cullet | packaging glass, brown | Cutoff, U	Ecoinvent v3.7.1	2021
Aluminum	aluminium ingot, primary, to aluminium, cast alloy market | Cutoff, U – GLO sheet rolling, aluminium | Cutoff, U - RoW	Ecoinvent v3.7.1	2021
Steel kegs	market for steel, low-alloyed | steel, low-alloyed | Cutoff, U	Ecoinvent v3.7.1	2021
Fiberboard	folding boxboard carton production | folding boxboard carton | Cutoff, U	Ecoinvent v3.7.1	2021
Corrugated	corrugated board box production | corrugated board box | Cutoff, U	Ecoinvent v3.7.1	2021
PRODUCTION			
Electricity	Ecoinvent datasets edited to reflect electricity mix of providers: market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - SERC market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - WECC, US only	Grid mixes for PVREA, City of Fort Collins in FCT, and Duke Energy in Asheville; Ecoinvent v3.7.1	2022 2021
Natural Gas	Natural Gas Combustion	US EPA *Inventory of US Greenhouse Gas Emissions and Sinks*	2022
Flaring	Primary data from New Belgium; 2% efficiency assumption from WRI, 2016[17]	New Belgium	2022
PRODUCT USE			
Use and Retail	Cooling and hotel load calculated with assumptions from BIER[18], NBB assumptions on refrigerator size, bottles per refrigerator and related factors, data on electricity consumption and sq ft for retail from EIA electricity emissions from US Grid, eGRID2019	BIER Carbon Footprint EIA CBECS eGRID2019	2012 2012 2022
TRANSPORTATION			
Truck	Medium and Heavy Duty Truck, Upstream Transportation and Distribution and Downstream Transportation	Table 9, US EPA *Inventory of US Greenhouse Gas Emissions and Sinks*	2021

[16] Note: BIER documentation is from 2012 and references IPCC 2006 document that uses IPCC Third Assessment Report. Methane emissions may be underestimated using TAR report. Product CFs remain unchanged with increased methane emission factor.

[17] World Resources Institute (WRI) (2016) "https://ghgprotocol.org/sites/default/files/standards/WRI16_WorkingPaper_FF.pdf

[18] Beverage Industry Environmental Roundtable (BIER). (2012) "Research on the Carbon Footprint of Beer."

Component	Dataset/ Emission Factor	Source	Publication Date
Rail	Rail, Upstream Transportation and Distribution and Downstream Transportation	Table 9, *US EPA GHG Emissions Inventory*	2022
Shipping	transport, freight, sea, transoceanic ship | transport, freight, sea, transoceanic ship | Cutoff, U	Ecoinvent v3.7.1	2021
END-OF-LIFE			
Landfill	process-specific burdens, residual material landfill | process-specific burdens, residual material landfill | Cutoff, U	Ecoinvent v3.7.1	2021
Incineration	process-specific burdens, municipal waste incineration | process-specific burdens, municipal waste incineration | Cutoff, U	Ecoinvent v3.7.1	2021
Compost	Mixed Organics, Net Emissions for Food Waste and Mixed Organics under each Materials Management Option	WARM Documentation	2020

Appendix B: Carbon Footprint Assurance Statement

Carbon Footprint Assurance Statement

Report Title: Carbon Footprint of New Belgium Brewery Fat Tire® Amber Ale and Mountain Time® Lager
Report Author: SCS Global Services
Third Party Reviewer: James Salazar, Coldstream Consulting
Date: January 28, 2023

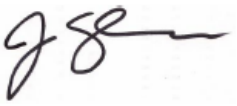
Coldstream Consulting recently completed a third-party review of SCS Global's *New Belgium Brewery Fat Tire® Amber Ale and Mountain Time® Lager, Dated January 25, 2023*. This statement summarizes the outcome of the review. Our detailed findings and recommendations were submitted to SCS Global Services in a separate "checklist" document that considered the conformance of the report to the requirements of the reference standard: *Greenhouse Gas Protocol: Product Life Cycle Accounting and Reporting Standard, September 2011*.

Level of Assurance: We are able to assign a reasonable assurance to the carbon footprint results Fat Tire® Amber Ale and Mountain Time® Lager based on the document provided for review. The project report clearly documented the system model, including all data sources and assumptions, and results. We found that the project report contained sufficient appropriate evidence for us to conclude that the carbon footprint conforms in all material respects with the WRI GHG Protocol for Products.

Independence and Competence: Coldstream Consulting is an independent third party with no affiliation to the project proponents beyond serving as an external reviewer. Coldstream Consulting are considered leaders in the field of product life cycle assessment and carbon footprinting and have conducted hundreds of such studies and reviews over the past 10 years.

Assurance process: Coldstream Consulting first prepared a checklist of all requirements in the reference standard: *Greenhouse Gas Protocol: Product Life Cycle Accounting and Reporting Standard, September 2011*. SCS then provided Coldstream Consulting with a draft report which we reviewed against the standard for conformance. The modeling parameters were also considered against similar research and known data sources to ensure the feasibility of the results.

Third Party Reviewer:



James Salazar

Phone: 250-306-0638 Email: james.salazar@coldstreamconsulting.com

Coldstream Consulting

Appendix C: Qualifying explanatory statements (QES) checklists

In accordance with PAS 2060: 2014 requirements, the QES checklist to support declaration of commitment to carbon neutrality is provided in the table below.

Table C1. Checklist for QES supporting declaration of commitment to carbon neutrality (based on Table B.1 of the PAS 2060: 2014 standard).

QES Checklist Requirements	Response
1) Identify the individual responsible for the evaluation and provision of data necessary for the substantiation of the declaration including that of preparing, substantiating, communicating and maintaining the declaration.	Refer to Section 2
2) Identify the entity responsible for making the declaration.	Refer to Section 2
3) Identify the subject of the declaration.	Refer to Section 2
4) Explain the rationale for the selection of the subject.	Refer to Section 2
5) Define the boundaries of the subject.	Refer to Section 2
6) Identify all characteristics (purposes, objectives or functionality) inherent to that subject.	Refer to Section 2
7) Identify and take into consideration all activities material to the fulfilment, achievement or delivery of the purposes, objectives or functionality of the subject.	Refer to Sections 2 and 3
8) Select which of the 3 options within PAS 2060 you intend to follow.	Refer to section 2
9) Identify the date by which the entity plans to achieve the status of “carbon neutrality” of the subject and specify the period for which the entity intends to maintain that status.	Refer to section 2
10) Select an appropriate standard and methodology for defining the subject, the GHG emissions associated with that subject and the calculation of the carbon footprint for the defined subject.	Refer to section 2
11) Provide justification for the selection of the methodology chosen.	Refer to section 2
12) Confirm that the selected methodology was applied in accordance with its provisions and the principles set out in PAS 2060.	Refer to section 2
13) Describe the actual types of GHG emissions, classification of emissions (Scope 1, 2 or 3) and size of carbon footprint of the subject exclusive of any purchases of carbon offsets.	Refer to section 3
a) All greenhouse gases shall be included and converted into tCO2e.	Refer to section 3
b) 100% Scope 1 (direct) emissions relevant to the subject shall be included when determining the carbon footprint.	Refer to section 3. Scope categorization not applicable to product footprint
c) 100% Scope 2 (indirect) emissions relevant to the subject shall be included when determining the carbon footprint.	Refer to section 3. Scope categorization not applicable to product footprint.
d) Where estimates of GHG emissions are used in the quantification of the subject carbon footprint (particularly when associated with scope 3 emissions) these shall be determined in a manner that precludes underestimation.	Refer to section 3. Scope categorization not applicable to product footprint.
e) Scope 1, 2 or 3 emission source estimated to be more that 1% of the total carbon footprint shall be taken into consideration unless evidence can be provided to demonstrate that such quantification would not be technically feasible or cost effective.	Refer to section 3.
f) The quantified carbon footprint shall cover at least 95% of the emissions from the subject.	Refer to section 3.
g) Where a single source contributes more than 50% of the total emissions, the 95% threshold applies to the remaining sources of emissions.	No source contributes over 50% of emissions. Refer to section 3.
h) Any exclusion and the reason for that exclusion shall be documented.	Refer to section 3.

QES Checklist Requirements	Response
14) Where the subject is an organization/company or part thereof, ensure that:	Subject is not an organization.
a) Boundaries are a true and fair representation of the organization's GHG emissions (i.e., shall include all GHG emissions relating to core operations including subsidiaries owned and operated by the organization).	Subject is not an organization.
b) Either the equity share or control approach has been used to define which GHG emissions are included. Under the equity share approach, the entity accounts for GHG emissions from the subject according to its share of equity in the subject. Under the control approach, the entity shall account for 100% of the GHG emissions over which it has financial and/or operational control.	Subject is not an organization.
15) Identify if the subject is part of an organization or a specific site or location and treat as a discrete operation with its own purpose, objectives and functionality.	Subject is not an organization.
16) Where the subject is a product or service, include all Scope 3 emissions (as the lifecycle of the product/service needs to be taken into consideration).	Refer to section 3. Scope categorization not applicable to product footprint.
17) Describe the actual methods used to quantify GHG emissions (e.g. use of primary or secondary data), the measurement unit(s) applied, the period of application and the size of the resulting carbon footprint.	Refer to section 3.
18) Provide details of, and explanation for, the exclusion of any Scope 3 emissions.	Refer to section 3. Scope categorization not applicable to product footprint.
19) Document all assumptions and calculations made in quantifying GHG emissions and in the selection or development of greenhouse gas emission factors.	Section 3 and Appendix C
20) Document your assessments of uncertainty and variability associated with defining boundaries and quantifying GHG emissions including the positive tolerances adopted in association with emission estimates.	Section 3 and Appendix C
21) Document carbon footprint management plan:	Refer to section 4.
a) Make a statement of commitment to carbon neutrality for the defined subject.	Section 2 and 4.
b) Set timescales for achieving carbon neutrality for the defined subject.	Section 4.
c) Specify targets for GHG reduction for the defined subject appropriate to the timescale for achieving carbon neutrality including the baseline date, the first qualification date and the first application period.	Section 4.
d) Document the planned means of achieving and maintaining GHG emissions reductions including assumptions made and any justification of the techniques and measures to be employed to reduce GHG emissions.	Section 4.
e) Specify the offset strategy including an estimate of the quantity of GHG emissions to be offset, the nature of the offsets and the likely number and type of credits.	Section 4.5 and 6
22) Implement a process for undertaking periodic assessments of performance against the Plan and for implementing corrective action to ensure targets are achieved.	Section 1.
23) Where the subject is a non-recurring event such as weddings or concert, identify ways of reducing GHG emissions to the maximum extent commensurate with enabling the event to meet its intended objectives before the event takes place and include post event review to determine whether or not the expected minimization in emissions has been achieved.	Not applicable
24) For any reductions in the GHG emissions from the defined subject delivered in the period immediately prior to the baseline date and not otherwise taken into account in any GHG emissions quantification (historic reductions), confirm: • the period from which these reductions are to be included; • that the required data is available and that calculations have been undertaken using the same methodology throughout;	Not applicable

QES Checklist Requirements	Response
• that assessment of historic reduction has been made in accordance with this PAS, reporting the quantity of historic reductions claimed in parallel with the report of total reduction.	
25) Record the number of times that the declaration of commitment has been renewed without declaration of achievement.	Not applicable
26) Specify the type of conformity assessment: a) independent third party certification; b) other party validation; c) self-validation.	Other party validation
27) Include statements of validation where declarations of commitment to carbon neutrality are validated by a third party certifier or second party organizations	Validated by SCS Global Services (other party/second party)
28) Date the QES and have it signed by the senior representative of the entity concerned (e.g. CEO of a corporation; Divisional Director, where the subject is a division of a larger entity; the Chairman of a town council or the head of the household for a family group).	Section 2
29) Make QES publicly available and provide a reference to any freely accessible information upon which substantiation depends (e.g. via websites).	Final QES to be made publicly available via the New Belgium Brewing Company website
30) Update the QES to reflect changes and actions that could affect the validity of the declaration of commitment to carbon neutrality.	Not Applicable

Table C2. Checklist for QES supporting declaration of achievement to carbon neutrality (based on Table B.2 of the PAS 2060: 2014 standard).

QES Checklist Requirements	Response
1) Define standard and methodology used to determine its GHG emissions reduction	Beverage Industry Environmental Roundtable (BIER). (2019) "Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance" in accordance with WRI GHG Protocol
2) Confirm that the methodology used was applied in accordance with its provisions and the principles set out in PAS 2060 were met.	Refer to Section 2
3) Provide justification for the selection of the methodologies chosen to quantify reductions in the carbon footprint, including all assumptions and calculations made and any assessment of uncertainty.	The methodology prescribed in the BIER guidelines aligns with WRI's Product Life Cycle Accounting and Report Standard and is specific to the product sector.
4) Describe the means by which reductions have been achieved and any applicable assumptions or justifications	Section 4.
5) Ensure that there has been no change to the definition of the subject.	Section 2 and 5
6) Describe the actual reductions achieved in absolute and intensity terms and as a percentage of the original carbon footprint.	Section 3
7) State the baseline/qualification date.	Section 5.
8) Record the percentage economic growth rate for the given application period used as a threshold for recognizing reductions in intensity terms	Section 3
9) Provide an explanation for circumstances where a GHG reduction in intensity terms is accompanied by an increase in absolute terms for the determined subject.	Not Applicable
10) Select and document the standard and methodology used to achieve carbon offset.	Section 6
11) Confirm that	

QES Checklist Requirements	Response
a) Offsets generated or allowance credits surrendered represent genuine, additional GHG emission reductions elsewhere	Section 6
b) Projects involved in delivering offsets meet the criteria of additionality, permanence, leakage and double counting.	Section 6
c) Carbon offsets are verified by an independent third party verifier.	Section 6
d) Credits from carbon offset projects are only issued after the emission reductions	Section 6
e) Credits from carbon offset projects are retired within 12 months from the date of the declaration of achievement	Section 6
f) Provision for event related option of 36 months to be added here	Not applicable
g) Credits from carbon offset projects are supported by publicly available project documentation on a registry which shall provide information about the offset project, quantification methodology and validation and verification procedures	Section 6
h) Credits from carbon offset projects are stored and retired in an independent credible registry	Section 6
12) Document the quantity or GHG emissions credits and the type and nature of credits actually purchased including the number and type of credits used and the time period over which credits were generated	
a) Which ghg emissions have been offset	Section 4 and 6.
b) The actual amount of carbon offset	Section 6
c) The type of credits and projects involved	Section 6
d) The number and type of carbon credits used and the time period over which the credits have been generated	Section 6
e) For events, a rationale to support any retirement of credits in excess of 12 months including details of any legacy emission savings, taken into account	Not applicable
f) Information regarding the retirement/cancellation of carbon credits to prevent their use by others including a link to the registry or equivalent publicly available record, where the credit has been retired	Section 6
13) Specify the type of conformity assessment	Other party validation , OPV-3
14) include statements of validation where declarations of achievement of carbon neutrality are validated by a third party certifier or second party organizations	Validated by SCS Global Services (other party/second party).
15) Date the QES and have it signed by the senior representative of the entity concerned	Section 4 of this document
16) Make QES publicly available and provide a reference to any freely accessible information upon which substantiation depends (e.g. via websites).	Final QES to be made publicly available via the New Belgium Brewing Company website

Qualifying Explanatory Statement According to PAS 2060:2014

Achievement of and Commitment to Product Carbon Neutrality for Mountain Time® Lager

Prepared for:
New Belgium Brewing Company

Date Completed:
September 22, 2022
Date Revised:
January 23, 2023

Prepared by:
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Reviewed by:
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Table of Contents

1.0 Introduction

New Belgium Brewing Company (New Belgium), maker of Mountain Time® Lager (Mountain Time®) and many other beers, is a leading craft brewing company headquartered in Fort Collins, Colorado with breweries in Fort Collins, Colorado and Asheville, North Carolina. Founded in 1991, New Belgium is an early leader in corporate sustainability, having commissioned the first carbon footprint study for beer in 2007, focused on a 6-pack of Fat Tire® Amber Ale. In 2022 the company purchased Bell's Brewery and has more than 1,300 employees nationwide. The combined company is owned by Lion Little World, a subsidiary of Kirin Holdings.

Since its founding, New Belgium has included environmental stewardship as a core value and key aim. As the effects of climate change are starting to appear in the supply chain and general marketplace, accelerating carbon neutral goals is a top priority for New Belgium. Voluntary commitments include: (1) carbon neutral certification for all beers by 2030, (2) sourcing 100% renewable electricity by 2030 or sooner (under Kirin and listed in RE100), and (3) An absolute reduction in GHG emissions in alignment with the Science Based Targets Initiative limiting warming to 1.5° C (under Kirin and listed in the SBTI registry).

This document forms the PAS 2060 Qualifying Explanatory Statement to demonstrate that Mountain Time® Lager products have achieved carbon neutrality in accordance with PAS 2060:2014 on January 1, 2021 for calendar year 2021, with commitment to maintain carbon neutrality through December 31, 2022. All information provided within this report has been reviewed and verified by a third party.

This document will be updated at least every 12 months to reflect New Belgium's status toward its carbon neutrality targets. The report is publicly available at www.newbelgium.com

2.0 Declaration of commitment to carbon neutrality

New Belgium is fully committed to achieving carbon neutrality for our Mountain Time® product line, in all formats as of 2019 and to maintain this commitment through 2022. We are pleased to have reached this goal through a variety of high-impact carbon offset projects, as documented and independently certified below.

CARBON NEUTRAL CERTIFIED BY SCS GLOBAL SERVICES

PAS 2060: 2014 Other Party Validation Requirement	Response
Individual responsible:	Katie Wallace, Chief ESG Officer
Entity making declaration:	New Belgium Brewing Company
Subject of PAS 2060 declaration:	Mountain Time® Lager
Description of subject:	See Table 2
Function of Subject:	Serve as an alcoholic beverage
Rationale for selection of the subject:	The scope and subject of this PAS 2060 includes entire product life cycle emissions including the following: (i) raw material extraction and processing (ii) production and packaging and (iii) product distribution, retail and consumption and (iv) end-of-life.
Boundaries of the subject	The scope and subject of this PAS 2060 includes entire product life cycle emissions including the following: (i) raw material extraction and processing (ii) production and packaging and (iii) product distribution, retail and consumption and (iv) end-of-life.
What type of conformity assessment has been undertaken?	OPV-3: Other party validation- unified (achievement and commitment)
Confirmation that methodology was applied in conformance with PAS 2060:2014	The application of the methodology conforms to principles set out in clause 6.1.2 of PAS 2060:2014.
Baseline period for PAS 2060: 2014 program:	1st January 2019- 31st December 2019
Achievement period:	1st January 2021- 31st December 2021
Commitment period:	1st January 2022- 31st December 2022
Standard for assessment of GHG emissions	GHG Protocol Product Life Cycle Accounting and Reporting Standard; The Beverage Industry Greenhouse Gas Emissions Sector Guidance.
Justification of assessment method	The methodology prescribed in the guidelines aligns with WRI's Product Life Cycle Accounting and Report Standard, meets PAS 2060 requirements, and is specific to the product sector.
Product Carbon Footprint Results	See Table 3A in Section 3 Mountain Time® 2021 Carbon Footprint
Executive Signature: Katie Wallace Chief ESG Officer	

3.0 Mountain Time® Lager Carbon Footprint

3.1 Introduction

The foundation of a carbon neutral certification is a full lifecycle carbon footprint analysis. This section describes the carbon footprint for Mountain Time® for calendar year 2021. Analysis of the carbon footprint allows prioritization of key action areas for greenhouse gas emissions reduction in both the short term and long term.

The terms "carbon emissions" and "greenhouse gas (GHG) emissions" are used interchangeably throughout the report.

3.2 Methodology

The methodology for the product carbon footprint accounting followed WRI GHG Protocol Product Standard[1], in conformance with the requirements of PAS 2060:2014[2]. The Beverage Industry Environmental Roundtable (BIER) Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance[3] was also instrumental in guiding the modeling of greenhouse gas emissions. The system boundary and calculation methodology for product carbon footprints were based on the BIER guidance[4]. The methodology for quantifying product footprints in the underlying assessment meets the accounting requirements and the publication of this document on the New Belgium website meets the communication requirements of WRI's Product Life Cycle Accounting and Report Standard a GHG assessment standard approved by PAS 2060:2014[5].

The assessment includes GHG emissions across the product life cycle for the following phases: (i) raw material extraction and processing, (ii) production and packaging, and (iii) product distribution, retail and consumption and (iv) end-of-life. These calculations were made and reported prior to the purchase of any carbon offsets by New Belgium.

The Scope 1-3 categorization of the WRI GHG Protocol does not apply to product carbon footprints. This PCF takes into account all emissions, direct and indirect, with the exception of those related to exclusions, see section 3.4.6, across the product life cycle.

The Mountain Time ® carbon footprint was verified by James Salazar, an independent LCA expert from Coldstream Consulting[6].

Table 2. *General information and scope of the PCF.*

Product Assessed	Mountain Time® Lager
Product Description	Mountain Time® Lager is produced with a variety of malts and hops and 4.4% alcohol by volume. Mountain Time® Lager is available in 12- and 19.2-fl oz cans, 12-fl oz bottles and in refillable kegs (standard size, 1/2 bbl).

[1] Greenhouse Gas Protocol. Product Life Cycle Accounting and Reporting Standard. World Resources Institute, and World Business Council for Sustainable Development. 2013.

[2] The British Standards Institution. (2014). PAS 2060:2014: Specification for the demonstration of carbon neutrality.

[3] Beverage Industry Environmental Roundtable (BIER). (2019) "Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance."

[4] Beverage Industry Environmental Roundtable (BIER) (2018). "The Beverage Industry Greenhouse Gas Emissions Sector Guidance. Version 4.0" https://www.bieroundtable.com/publication/greenhouse-gas-emissions-sector-guidance/

[5] See Appendix A in WRI's Product Life Cycle Accounting and Report Standard.

[6] http://www.coldstreamconsulting.com/

Unit of Analysis	12-fl oz of beer available in different packaging types: 12-fl oz aluminum can 19.2-fl oz aluminum can 12-fl oz glass bottles 1 standard size keg (1/2 bbl or 15.5 U.S. gallons - for commercial consumption)
Reference Flow	12-fl oz (355 mL) of packaged Mountain Time® Lager
Type of GHG Inventory	Cradle-to-Grave
Time Period	2021, calendar year

Emissions are reported in MT CO_2e, in line with PAS 2060, and includes the emissions of all applicable Kyoto protocol pollutants, namely Carbon Dioxide, Methane, Nitrous Oxide, Sulfur Hexafluoride and refrigerants.

3.2.1 The Product System under Study

New Belgium Mountain Time® is a craft beer of New Belgium Brewery produced in their brewing facilities located in Fort Collins, Colorado and Asheville, North Carolina. The product system was modeled based on primary data and information provided by New Belgium. The study included several key data requirements:

- Purchased material inputs to Mountain Time®,
- Material weights per product for primary packaging,
- Scrap generated during the packaging process for fiberboard and corrugated packaging,
- Transportation data for Mountain Time® raw materials,
- Primary data for New Belgium operations, including energy use and waste generation,
- Primary data on product distribution,

Representative inventory data for many unit processes was selected using secondary data from the Ecoinvent[7] life cycle database with a prioritization for data with the highest degree of representativeness of the actual material or process.

Life cycle modeling of Mountain Time® was divided into the following distinct life cycle phases:

- Material acquisition and pre-processing: This stage begins with agricultural production of the main ingredients, barley and hops. Barley production has been found to be a major contributor to the carbon footprint of beer in previous PCFs[8], by requiring the use of seed production, irrigation, agricultural machinery, pesticide and herbicide use and production and tillage. Once barley has been harvested it is transferred to a malting facility where it is germinated and dried to produce malt, a process that requires

[7] Ecoinvent Centre (2018) Ecoinvent data from v3.5. Swiss Center for Life Cycle Inventories, Dübendorf, 2017 http://www.Ecoinvent.org

[8] State of Oregon Department of Environmental Quality (2017). *Food Product Environmental Footprint Literature Summary: Beer.* https://www.oregon.gov/deq/FilterDocs/PEF-Beer-FullReport.pdf

water and energy. This stage includes GHG impacts associated with the transportation of these material inputs to the facilities in Fort Collins, CO and Asheville, NC, and ends when the product components enter the gate of the respective production facilities. Additionally, included in this stage is the extraction of resources from nature for production components and packaging materials. Packaging has also been found to be a significant contributor to the overall product carbon footprint[9], depending upon the material used. Purchased CO_2 transportation is included in the scope, but the production of CO_2 is excluded as per the BIER guidelines because of the particular CO_2 is a byproduct of a biogenic process.

- Production: The production stage begins when the product components enter the brewery and ends when the packaged beverage leaves the production gate for distribution. The functional unit is the packaged beer. It includes GHG emissions from energy use and emissions associated with brewing and packaging of the finished Mountain Time® products, as well as the management of wastes produced.

- Product Distribution and Retail: This stage begins when the finished product leaves the gate of the Fort Collins or Asheville breweries and ends with retail. It represents the greenhouse gas emissions associated with transport of the finished product from the breweries to various distributors. The retail modeling includes the hotel load, or the proportion of building lighting and energy allocated to the product, and cooling, the use of energy required to control the temperature of the product before purchase.

- Product Use: The use stage includes the transportation from retailer to consumer and cooling while in consumer storage prior to consumption. Note - the hotel load for on-premise consumption is included in the Product Distribution and Retail stage.

- End-of-Life: This stage includes greenhouse gas emissions from transport of product packaging to waste treatment facilities and from waste treatment activities, landfill or incineration, from product packaging. Recycling processes are not included due to the recycled content cut-off assumption. For on-premise consumption, kegs are collected and may be reused 100 times or more. Previous studies have modeled keg re-use 70 times[6]. New Belgium notes that their kegs are re-used hundreds of times but unable to measure the number with certainty.

3.2.2 Allocation Procedures

Allocation is required when a single product system produces more than one product. Allocation addresses the problem of how to divide resource use, energy use and emissions between multiple products produced at the same production facility. Allocation guidelines in ISO 14044, the GHG Protocol Product Standard and PAS 2060, state that wherever possible, the use of allocation should be minimized. However, if allocation is required, ISO 14044 states that mass-based allocation should be used preferentially over economic

[9] Cimini and Moresi (2016). *Carbon footprint of a pale lager packed in different formats: assessment and sensitivity analysis based on transparent data*. Journal of Cleaner Production 112: 4196- 4213.

allocation, and for this reason, a mass-based allocation approach was used where necessary. Mass-based allocation takes a physical approach by partitioning inputs and outputs in the product system, based on relative mass of products and co-products generated.

Primary data for the facilities were obtained from New Belgium. A mass-based allocation method was applied to determine the amount of energy and resource inputs relative to one 12 oz serving of Mountain Time® produced at the Fort Collins and Asheville facilities. The Fort Collins and Asheville facilities brew multiple types of beer, and in cases where the data was available specifically for Mountain Time® or Mountain Time ® production, this data was used. In cases where only facility-level data was available, resource use was allocated to the beers by the proportion of Mountain Time ® to total beer production at that facility on a mass basis. The final results for Mountain Time® were calculated based upon a production weighted average of the amount of Mountain Time® Fort Collins and Asheville facilities.

The electricity supply mixes for the breweries are modeled using electricity generation mixes provided by the local utilities for each brewery and with ecoinvent datasets. For electricity use at processes downstream of the breweries (e.g., refrigeration), a U.S. average electricity supply mix was used.

Allocation used within the secondary databases utilized for the system is primarily based on physical relationships. Impacts from transportation were allocated based on the mass of material and distance transported.

3.2.3 Cut-off Criteria

All significant inputs and outputs relevant to the Mountain Time® product system were included in the PCF calculations with the exception of some materials which represent less than 1% of total impact. All known materials and processes contributing greater than 1% of the total environmental impact indicator for each impact were included in the life cycle inventory. Notable omissions include yeast, minor brewing additives, and packaging adhesives and shrink wrap.

3.2.4 Carbon Footprint Methodology and Interpretation Used

Greenhouse gas indicators are calculated as the product of the 100-year GWP and the mass of greenhouse emission, summed over all contributing greenhouse gases and for all sources and sinks within the life cycle system boundary for the assessed product. Results are reported in units of grams (g) CO2 eq across the life cycle, as well as by contributing life cycle phase. Greenhouse gas emissions are also summarized separately for fossil and biogenic carbon sources and sinks. Additionally, GHG emissions arising from changes in land use and carbon uptake by soil, are reported. The method of accounting for biogenic CO_2, CO_2 from land use

change, and CO_2 uptake are taken from the GHG Protocol method in openLCA LCIA methods v2.0.3[10] in Ecoinvent. All results are calculated. The IPCC 2021 metrics are used for calculation of results.

3.3 Product lifecycle boundaries

This footprint includes "cradle-to-grave" GHG emissions associated with Mountain Time® in all forms and packaging, brewed at the Fort Collins, CO and Asheville, NC facilities. Shown below is a process map for the entire lifecycle of Mountain Time® beer from raw ingredients through final consumption by consumers.

The process map in Figure 1 defines the life cycle stages and illustrates the key processes contributing measurably to category indicator results for the greenhouse gas indicators specified in the GHG Protocol Product Standard. Impacts associated with capital goods (e.g., machinery, trucks, infrastructure), overhead operations (e.g., office lighting), corporate activities (e.g. research and development, travel) are defined as non-attributable processes and are not included in the PCF.

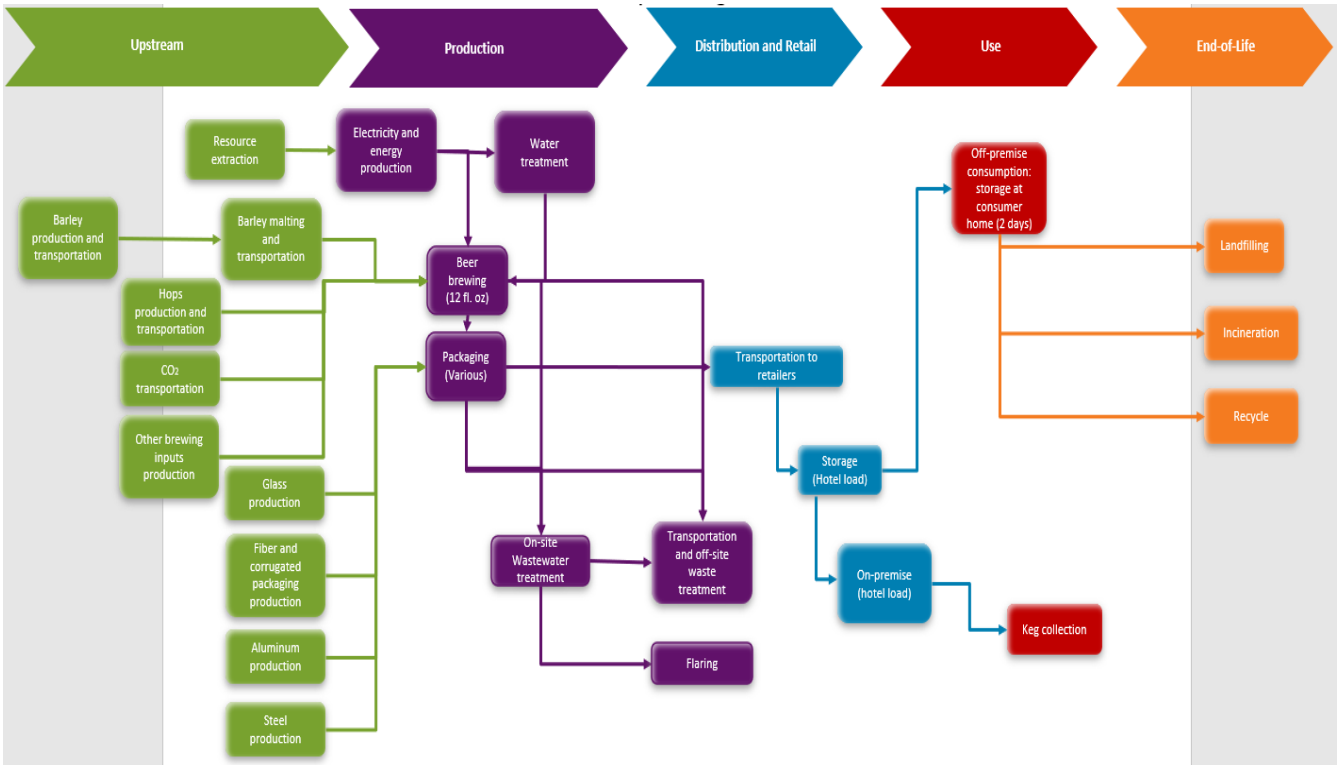


Figure 1. *Process map illustrating the key processing included by life cycle stage of 12-fl oz of Mountain Time® beer.*

[10] openLCA LCIA methods v.2.0.3 https://nexus.openlca.org/database/openLCA%20LCIA%20methods

3.4 Total carbon footprint

The GHG emissions for all Mountain Time® products produced between January 1, 2021 and December 31, 2021 equals 1,846 MT CO2e. Comparing these results to the baseline year (2019) shows on an absolute basis, the GHG emissions for Mountain Time increased from 597 MT CO2e in 2019 to 1,846 MT CO2e in 2021. This increase can be attributed to a 252% increase in the production of Mountain Time from 2019 to 2021. The number of 12-fl oz services of Mountain Time in 2019 was 2,805,048 compared to 7,347,744 in 2021. Using the total 12-fl oz servings to convert the GHG emissions for 2019 and 2021 to an intensity-based figure, results in .29 Kgs CO2e per 12-fl oz serving in 2019 versus .25 Kgs CO2e per 12 ounce serving in 2021. This equates to a 12% decrease in GHG emissions in 2021. Table 3A and 3B summarize the GHG emission results for 2021 and 2019 respectively. Tables 4A through 4D summarize the GHG emissions for 2021 by the individual products.

Table 3A. Summary of cradle-to-grave product carbon footprint for Mountain Time® Lager, and the total Cradle to Grave carbon footprint for Mountain Time® products, as calculated using 2021 packaged data. *Note – annual totals are expressed in metric tons CO2e.*

Product	Cradle-to-Grave per serving (g CO_2e)	Total servings (12-fl oz/ 355mL) by packaged product	Cradle-to-Grave Total (2021) (MT CO2e)	Cradle-to-Grave Total (Kgs CO2e/12-fl oz)
12-fl oz bottle	401	594,869	239	-
12-fl oz can	258	5,224,864	1,346	
19.2-fl oz can	239	44,309	11	-
Standard keg	169	1,483,701	251	-
TOTAL	**-**	**7,347,744**	**1,846**	**.25**

** Some totals may not add up due to rounding.*

Table 3B. Summary of cradle-to-grave product carbon footprint for Mountain Time® Lager, and the total cradle-to-grave carbon footprint for Mountain Time® products, as calculated using 2019 packaged data. *Note – annual totals are expressed in metric tons CO2e.*

Product	Cradle-to-Grave per serving (g CO_2e)	Total servings (12-fl oz/ 355mL) by packaged product	Cradle-to-Grave Total (2019) (MT CO2e)	Cradle-to-Grave Total (Kgs CO2e/12-fl oz)
12-fl oz can	320	1,373,904	441	-
19.2-fl oz can	270	124,656	33	-
Standard keg	210	586,488	123	-
TOTAL	**-**	**2,085,048**	**597**	**.29**

** Some totals may not add up due to rounding.*

Table 4A. Summary of cradle-to-grave product carbon footprint absolute results for 12-fl oz (355 mL) of Mountain Time® in a 12-fl oz aluminum can, calculated using IPCC 2021 metrics. *

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (Packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**258**	**177**	**52.5**	**21.8**	**6.51**	**0.109**
Fossil CO_2 eq	g CO_2 eq	263	185	49.9	21.8	6.51	0.108
Biogenic CO_2 eq	g CO_2 eq	20.5	17.9	2.61	0.00	0.00	0.00117
CO_2 eq from land transformation	g CO_2 eq	0.0112	0.0112	$3.87x10^{-5}$	0.00	0.00	$8.05x10^{-7}$
CO_2 uptake	g CO_2 eq	26.1	26.1	0.00326	0.00	0.00	$2.75x10^{-4}$

Table 4B. Summary of cradle-to-grave product carbon footprint absolute results for 12-fl oz (355 mL) of Mountain Time®, packaged in a 19.2-fl oz aluminum can, calculated using IPCC 2021 metrics. *

Greenhouse Gas Indicators	Units	Total (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**239**	**158**	**52.5**	**21.9**	**6.50**	**0.0972**
Fossil CO_2 eq	g CO_2 eq	238	159	49.9	21.9	6.50	0.0964
Biogenic CO_2 eq	g CO_2 eq	9.8	7.15	2.61	0.00	0.00	0.00102
CO_2 eq from land transformation	g CO_2 eq	0.0130	0.0130	$3.87x10^{-5}$	0.00	0.00	$7.28x10^{-7}$
CO_2 uptake	g CO_2 eq	8.76	8.76	0.00326	0.000	0.000	$2.51x10^{-4}$

Table 4C. Summary of cradle-to-grave product carbon footprint absolute results for 12-fl oz (355 mL) of Mountain Time®, packaged in a 12- fl oz glass bottle, calculated using IPCC 2021 metrics*

Greenhouse Gas Indicators	Units	Total* (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**401**	**315**	**52.5**	**25.2**	**7.21**	**1.54**
Fossil CO_2 eq	g CO_2 eq	427	345	49.9	25.2	7.21	1.53
Biogenic CO_2 eq	g CO_2 eq	51.0	48.4	2.61	0.00	0.00	0.0154
CO_2 eq from land transformation	g CO_2 eq	0.0239	0.0239	$3.87x10^{-5}$	0.00	0.00	$1.19x10^{-5}$
CO_2 uptake	g CO_2 eq	78.6	78.6	0.00326	0.00	0.00	0.00415

Table 4D. Summary of cradle-to-grave product carbon footprint absolute results for 12-fl oz (355 mL) of Mountain Time®, packaged in a keg (1/2 bbl), calculated using IPCC 2021 metrics*

Greenhouse Gas Indicators	Units	Total* (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
Cradle-to-Grave Carbon Footprint							
Total	**g CO_2 eq**	**169**	**82.1**	**52.5**	**34.9**	**0.00**	**$8.00x10^{-3}$**
Fossil CO_2 eq	g CO_2 eq	166	81.7	49.9	34.9	0.00	$7.96x10^{-3}$
Biogenic CO_2 eq	g CO_2 eq	3.13	0.526	2.61	0.00	0.00	$6.46x10^{-5}$

Greenhouse Gas Indicators	Units	Total* (cradle-to-grave)	Upstream Materials	Production	Distribution	Product Use	End-of-Life (packaging)
CO_2 eq from land transformation	g CO_2 eq	0.00576	0.00573	$3.87x10^{-5}$	0.00	0.00	$6.96x10^{-8}$
CO_2 uptake	g CO_2 eq	0.0825	0.0792	0.00326	0.00	0.00	$2.57x10^{-5}$

**Results are rounded to three significant figures. Some totals may not add up due to rounding.*

3.4.1 Upstream Emissions

The processes covered in the Upstream Materials life cycle phase include both cultivation of ingredients and raw material processing for the agricultural products, transportation of raw materials and transportation from material processing sites to New Belgium breweries, and the production and transportation of packaging materials. Barley cultivation consists of the seed production, irrigation, fertilizer and pesticide use, soil emissions, and agricultural machinery for agricultural products. Raw material processing consists of barley malting and transportation from the malting facility or distribution center to New Belgium breweries. Carbon dioxide is purchased as a byproduct from a fertilizer producer and used to barrier between the beer and oxygen all throughout the process except for fermentation. It is also used to push draft beer from the keg to the tap.

Other minor components of the manufacturing process, such as yeast, and other ingredients were used in small amounts, and assumed to contribute less than 1% of environmental impact and no more than 5% when summed together.

3.4.2 Production Emissions

Included in manufacturing life cycle stage are emissions related to processes which occur at New Belgium Breweries for Mountain Time®, packaging, energy use, and manufacturing waste treatment, and allocated to Mountain Time® products by volume, including (a) electricity use at New Belgium breweries, (b) fugitive emissions at the breweries, including the purchased CO_2 purged from tanks and refrigerant leakage, (c) natural gas used to run boilers at the breweries, and (d) flaring of methane-rich biogas from the onsite process water treatment plants in Fort Collins, Colorado and Asheville, North Carolina, (e) the transportation of recycled, composted, byproduct and landfilled manufacturing waste, as well as the emissions from landfilling manufacturing waste. See Section 4 on the plans to mitigate and offset these emissions.

- *Natural gas combustion.* Data calculated based on natural gas purchases for Fort Collins and Asheville breweries. Includes natural gas used at all buildings at both locations (FTC: Main brewery, PWTP, Distribution

Center; AVL: Main Brewery, Distribution Center and PWTP). The natural gas for facilities outside of the brewing scope is assumed to be insignificant.

- *Flaring,* from biogas produced during anaerobic digestion of organic manufacturing wastes. Data calculated by New Belgium using the flow rate of flaring and amount of time flaring took place. The methane content of the biogas was determined to be 75.3% by New Belgium in previous analyses, and the flaring efficiency was 98% and 99% for FTC and AVL, respectively, based upon GHG Protocol Documentation and the Manufacturer specifications.

- *Fugitive emissions,* calculated from charged refrigerant purchases, and calculated CO2 losses while assisting beer pushing.

- *Purchased electricity,* for the Fort Collins, Colorado and Asheville, North Carolina breweries equivalent to the Mountain Time® reference flow, calculated from monthly meter readings. See Section 4 on the plans to mitigate and offset these emissions.

- *Manufacturing wastes*, which includes consideration of transportation for recycling, transportation to and emissions from landfilling, and transportation and emissions from composting of wastes generated at the breweries. Transportation of recycling and wastes were included, based upon an assumed average 20-mile distance by truck to waste treatment as estimated for the EPA Warm model[11].

- *Manufacturing byproducts*, Transportation for three manufacturing byproducts: spent grains which are sold to agricultural applications, spent yeast which are also sold; and land-applied sludge produced as a byproduct of anaerobic digestion

3.4.3 Distribution Emissions

Mountain Time ® is produced in Fort Collins, CO and Asheville, NC and shipped to domestically by truck transport. Distribution is based upon the assumption that 95 beer barrels (bbls), or approximately 2,950 gallons, are contained in a shipment, an assumption made by New Belgium. Product is shipped domestically by truck transport.

3.4.4 Retail and Product Use Emissions

Products are sold from third parties for consumption on or off-premise. On-premise consumption refers to the hotel load and cooling of kegs for draught beer at hotels, bars, restaurants, etc. Off-premise consumption refers to the hotel load and cooling required for bottles and cans at a liquor store,

[11] "*WARM Model Transportation Research - Draft*." Memorandum from ICF Consulting to United States Environmental Protection Agency. September 7, 2004.
http://epa.gov/epawaste/conserve/tools/warm/SWMGHGreport.html#background.

convenience store, or supermarket and final consumption by the consumer at home. Retail scenarios are based on input from the manufacturer and BIER documentation guidelines[12,13]. Assumptions about the average electricity use and average retail size are based on the EIA Consumer Building Energy Consumption Survey (CBECS). The breakdown of product sold at convenience stores and larger, supermarket-type retailers is taken from primary data obtained from NBB.

Once consumers arrive at home with their product, additional refrigeration and energy are often required prior to final consumption. Assumptions and calculations for at-home refrigeration are based on the BIER documentation. Emissions from electricity used for both on-premise and off-premise retail and use are based upon the national average electricity supply mix derived from eGRID because Mountain Time® is purchased and consumed throughout the US. It is assumed that retail and product use in international locations is significantly similar to that in the US given that much of consumption is in European and OECD countries, and international consumption consists of 1.2% of total consumption.

3.4.5 End-of-Life Emissions

At end-of-life the packaging materials are disposed of. No specific data are available regarding the specific waste processing of Mountain Time® packaging materials. It is assumed that after consumption, the packaging materials are transported to a waste treatment facility. The type of waste treatment, by packaging material type, is taken from the US Environmental Protection Agency[14] data for packaging materials.

Table 5. Assumed management for Mountain Time® packaging materials at end of life by material type.

Packaging	Landfilled	Incinerated	Recycled
Glass	55%	13%	31%
Aluminum	52%	13%	35%
Fiberboard	15%	4%	81%
Steel	21%	5%	74%

Transportation at end of life assumes a 20-mile average distance to disposal, consistent with assumptions used in the US EPA WARM model[15].

[12] Beverage Industry Environmental Roundtable (BIER). (2019) “Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance.”
[13] Beverage Industry Environmental Roundtable (BIER). (2012) "Research on the Carbon Footprint of Beer.”
[14] US Environmental Protection Agency. 2020. “Advancing Sustainable Materials Management: 2018 Fact Sheet.” https://www.epa.gov/sites/production/files/2019-11/documents/2017_facts_and_figures_fact_sheet_final.pdf
[15] "*WARM Model Transportation Research - Draft*." Memorandum from ICF Consulting to United States Environmental Protection Agency. September 7, 2004. http://epa.gov/epawaste/conserve/tools/warm/SWMGHGreport.html#background.

3.4.6 Exclusions

All significant inputs and outputs relevant to the Mountain Time® product system are included in the product carbon footprint calculations with the exception of some materials which represent less than 1% of total impact. All known materials and processes contributing greater than 1% of the total environmental impact indicator for each impact were included in the life cycle inventory. Notable omissions of less than 1% of total impact include yeast, minor brewing ingredients, packaging adhesives, and shrink wrap.

4.0 Mountain Time® Lager Carbon Management Plan

4.1 Introduction

New Belgium Brewing Company, maker of Fat Tire® Amber Ale (Fat Tire®), Mountain Time® Lager and a host of other brands is headquartered in Fort Collins, Colorado with an east coast brewery in Asheville, NC. Since its founding in 1991, New Belgium has been a leader in sustainability, becoming the first wind-powered brewery in 1999, commissioning the first carbon footprint study for a beer in 2008 and becoming the first craft brewer in the United States to achieve carbon neutral certification in 2019 for its flagship beer, Fat Tire®. In 2022 the company purchased Bell's Brewery and has more than 1,300 coworkers nationwide. The combined company is owned by Lion Little World, a subsidiary of Kirin Holdings.

For over 30 years, New Belgium has prioritized environmental stewardship as a core value and key aim. With the effects of climate change already impacting the craft brewing supply chain and being felt across the globe, accelerating action to avert the worst impacts is a top priority for New Belgium. Voluntary commitments include (1) carbon neutral certification for all beers by 2030, (2) sourcing 100% renewable electricity by 2030 (under our parent company Kirin listed in RE100), and (3) absolute reduction in GHG emissions in alignment with the Science-Based Targets Initiative, limiting warming to 1.5 Celsius. A 55% reduction in Scopes 1-2, 30% reduction in Scope 3 (under our parent company Kirin listed in the SBTi registry).

This document will be updated at least every 12 months to reflect New Belgium's status toward its carbon neutrality targets. The report is publicly available at www.newbelgium.com

4.2 Mountain Time® Lager base year carbon footprint

The carbon footprint as described in section 3 used primary data from calendar year 2021 as the baseline for this carbon neutral achievement and commitment.

4.3 Historic and ongoing reduction in emissions

For 30+ years New Belgium has been targeting resource conservation and GHG emissions reductions. Beginning in the original basement brewhouse the company's cofounder rigged a rudimentary heat exchanger onto the kettle capturing and reusing heat energy from the boil. In the 1990s and with every expansion, energy efficiency was designed into buildings and multiple heat capture and reuse technologies were implemented wherever possible. In 1999, coworkers offered up annual profit sharing to help bring wind power to the City of Fort Collins, making New Belgium the first wind-powered brewery in the United States. In the 2000s, a project to light-weight glass bottles reduced emissions from the production and shipping of these containers. Eliminating cardboard dividers in 12-packs has also saved both weight and space on trucks. The Fort Collins, CO brewery has achieved platinum-level certification by TRUE Zero Waste and the Asheville, NC brewery is pursuing this certification in 2022. In 2002 an onsite process water treatment plant began capturing methane-rich biogas and the addition of combined heat and power (CHP) engines converts the biogas to electricity helping power brewing operations. With a recent upgrade, our 500 KW CHP engine is producing roughly 1,000,000 KWs per year and about 2 million gallons of heated brewing water from waste heat. In the 2010s, New Belgium installed – what was at the time – the largest privately-owned solar array in Colorado. In 2011, company sales reps moved to 100% electric vehicles and hybrid delivery trucks. Onsite charging stations are available for both coworkers and guests. Instead of locating our large-scale expansion at our current site in Colorado, we chose North Carolina to reduce the emissions from cross-country shipping. The buildings on this new campus are all LEED-certified at Silver, Gold, or Platinum levels. In 2022 the Asheville brewery installed a 446 KW solar array estimated to produced 620,000 kWh of electricity annually. The new solar array along with several other capital expenditures representing $1+ million in investments will reduce CO_2e emissions by an estimated 700 metric tons/year.

To drive GHG reductions in our value chain, New Belgium's philanthropy program has provided grants to barley breeders to support the development of more climate-friendly and climate-resilient barley varieties. In 2015 we co-founded the Glass Recycling Coalition, a value-chain-led organization that seeks to improve glass recycling in the United States, a necessary step in reducing GHG emissions from glass bottles. Partially as a result of our efforts in 2018, the City Council in Fort Collins adopted its own 100% renewable electricity by 2030 goal. As we're certain 100% renewable electricity is most efficiently achieved at scale, New Belgium is active in policy advocacy at local, state, and national levels. In 2020 we brewed Torched Earth Ale to demonstrate what the future of beer could taste like if climate change continues unchecked. We followed this up by publishing the entirety of our carbon neutral blueprint for businesses to help others take action to reduce their GHG emissions and join us on the road to carbon neutrality (drinksustainably.com).

Each of the initiatives listed above and more are ongoing at New Belgium targeting emissions reductions related to Mountain Time® Fat Tire® and every other beer we brew.

4.4 Future emissions reduction plan

We've allocated over $3 million for capital expenditures in 2023 to be used in decarbonizing our breweries. We'll add systems to capture fermentative CO_2 for reuse, invest in renewables, and increase operational efficiencies while we continue to evaluate emerging technologies and low to no carbon energy sources.

As 86% of New Belgium's annual GHG emissions are a result of upstream and downstream activities, i.e., non-manufacturing related emissions, we also recognize a need to reduce emissions within our value chain. In 2022 New Belgium launched a Sustainable Supplier Program aimed at helping suppliers reduce emissions related to our top three sources. One element of the program is an interactive supplier portal providing guidance and resources to help suppliers decarbonize. Through the portal suppliers will provide annual plant-level emissions data for the facilities that supply our breweries, increasing our understanding of New Belgium's Scope 3 impact and helping demonstrate progress on our decarbonization goals.

Carbon neutral certification for Fat Tire® and Mountain Time® in 2021 has been achieved through historical GHG reductions and the purchase of carbon offsets and will be followed by a continued effort to reduce actual GHG emissions throughout the lifecycle of these and other beers.

4.5 The use of carbon offsets

For unavoidable GHG emissions with the lifecycle of Mountain Time®, New Belgium will purchase carbon offsets to satisfy requirements for carbon neutral certification. The credits will be sourced from projects that meet the following criteria: 1) create genuine, additional reductions in GHG emissions free of double-counting, (2) ensure a high level of confidence in permanence, (3) avoid and fully account for leakage and error, (4) verified by an independent, certified third party verifier, (5) issued after the emission reduction has taken place, (6) meet nationally recognized standards established by credible organizations and stored and retired within their registries with publicly available documentation, (7) align with our source of emissions and value chain.

5.0 Declaration of achievement of carbon neutrality for 2021

PAS 2060: 2014 Other Party Validation Requirement	Response
Achievement period	1st January 2021- 31st December 2021
Carbon footprint of the subject during the achievement period	.25 Kgs CO_2e per 12-fl oz serving (intensity basis)
Means by which reductions have been achieved	Carbon offsetting
Standard and methodology used to achieve carbon offset	See Section 6.
Carbon offsetting information required to comply with clause 9.1.2	See Section 6

What type of conformity assessment has been undertaken?	OPV-3: Other party validation- unified (achievement and commitment)
Achievement period:	1st January 2021- 31st December 2021
Standard for assessment of GHG emissions	The Beverage Industry Greenhouse Gas Emissions Sector Guidance. The methodology prescribed in the guidelines aligns with WRI's Product Life Cycle Accounting and Report Standard.
Date	
Executive Signature: Katie Wallace Chief ESG Officer	

6.0 Carbon offsetting

Carbon offsets equivalent to 1,846 MT CO_2e have been purchased from the following projects to achieve carbon neutral certification for Mountain Time® for the calendar year of 2021. Note that the total number of offsets purchased by New Belgium Brewing exceeds the product carbon footprint of the subject during the achievement period.

Project 1

Project Title and ID Number: Hudson Technologies HFC Reclamation Project Champaign 2020; ACR-US-629-2020-1368-268587 to 290982
Country: United States
Project Type: Industrial Process Emissions
Project Standard: American Carbon Registry
Methodology Used: Use of Certified Reclaimed HFC Refrigerants
Vintage: 2020
Project documentation database link:
https://acr2.apx.com/mymodule/rpt/CertificateInfo.asp?rhid=7562&ftType=PRO&r=206&ad=Prpt&act=update&type=PRO&aProj=icrt&tablename=doc
Alignment with New Belgium selection criteria: Supporting recovery and reuse of HFC refrigerants used in refrigeration of beer.

Project 2

Project Title and ID Number: Indigo U.S. Project No. 1; CAR-1-US-1459-47-1002-MA-2019-6949-2901 to 5900 and CAR-1-US-1459-47-1002-MA-2020-6947-3001 to 5000
Country: United States
Project Type: Soil Enrichment
Project Standard: Climate Action Reserve
Methodology Used: U.S. Soil Enrichment Protocol V 1.0
Vintage: 2019 & 2020
Project documentation database link:
https://thereserve2.apx.com/mymodule/rpt/CertificateInfo.asp?rhid=12529&ftType=PRO&r=206&

ad=Prpt&act=update&type=PRO&aProj=icrt&tablename=doc and
https://thereserve2.apx.com/mymodule/rpt/CertificateInfo.asp?rhid=12530&ftType=PRO&r=206&ad=Prpt&act=update&type=PRO&aProj=icrt&tablename=doc

Alignment with New Belgium selection criteria: Supporting sequestration of emissions related to fugitive emissions, transportation, and fiber packaging.

Appendix A: Secondary Data and Emissions Factors

Component	Dataset/ Emission Factor	Source	Publication Date
MOUNTAIN TIME and MOUNTAIN TIME			
Barley	barley production | barley grain | Cutoff, U	Ecoinvent v3.7.1	2021
Malt	Malting emissions per serving	BIER Carbon Footprint[16]	2012
Hops	Hops production per serving	BIER Carbon Footprint	2012
PACKAGING			
Glass	packaging glass production, brown, without cullet | packaging glass, brown | Cutoff, U	Ecoinvent v3.7.1	2021
Aluminum	aluminium ingot, primary, to aluminium, cast alloy market | Cutoff, U – GLO sheet rolling, aluminium | Cutoff, U - RoW	Ecoinvent v3.7.1	2021
Steel kegs	market for steel, low-alloyed | steel, low-alloyed | Cutoff, U	Ecoinvent v3.7.1	2021
Fiberboard	folding boxboard carton production | folding boxboard carton | Cutoff, U	Ecoinvent v3.7.1	2021
Corrugated	corrugated board box production | corrugated board box | Cutoff, U	Ecoinvent v3.7.1	2021
PRODUCTION			
Electricity	Ecoinvent datasets edited to reflect electricity mix of providers: market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - SERC market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - WECC, US only	Grid mixes for PVREA, City of Fort Collins in FCT, and Duke Energy in Asheville; Ecoinvent v3.7.1	2022 2021
Natural Gas	Natural Gas Combustion	US EPA *Inventory of US Greenhouse Gas Emissions and Sinks*	2022
Flaring	Primary data from New Belgium; 2% efficiency assumption from WRI, 2016[17]	New Belgium	2022
PRODUCT USE			
Use and Retail	Cooling and hotel load calculated with assumptions from BIER[18], NBB assumptions on refrigerator size, bottles per refrigerator and related factors, data on electricity consumption and sq ft for retail from EIA electricity emissions from US Grid, eGRID2019	BIER Carbon Footprint EIA CBECS eGRID2019	2012 2012 2022
TRANSPORTATION			
Truck	Medium and Heavy Duty Truck, Upstream Transportation and Distribution and Downstream Transportation	Table 9, US EPA *Inventory of US Greenhouse Gas Emissions and Sinks*	2021

[16] Note: BIER documentation is from 2012 and references IPCC 2006 document that uses IPCC Third Assessment Report. Methane emissions may be underestimated using TAR report. Product CFs remain unchanged with increased methane emission factor.

[17] World Resources Institute (WRI) (2016) "https://ghgprotocol.org/sites/default/files/standards/WRI16_WorkingPaper_FF.pdf

[18] Beverage Industry Environmental Roundtable (BIER). (2012) "Research on the Carbon Footprint of Beer."

Component	Dataset/ Emission Factor	Source	Publication Date
Rail	Rail, Upstream Transportation and Distribution and Downstream Transportation	Table 9, *US EPA GHG Emissions Inventory*	2022
Shipping	transport, freight, sea, transoceanic ship | transport, freight, sea, transoceanic ship | Cutoff, U	Ecoinvent v3.7.1	2021
END-OF-LIFE			
Landfill	process-specific burdens, residual material landfill | process-specific burdens, residual material landfill | Cutoff, U	Ecoinvent v3.7.1	2021
Incineration	process-specific burdens, municipal waste incineration | process-specific burdens, municipal waste incineration | Cutoff, U	Ecoinvent v3.7.1	2021
Compost	Mixed Organics, Net Emissions for Food Waste and Mixed Organics under each Materials Management Option	WARM Documentation	2020

Appendix B: Carbon Footprint Assurance Statement

Carbon Footprint Assurance Statement

Report Title: Carbon Footprint of New Belgium Brewery Fat Tire® Amber Ale and Mountain Time® Lager
Report Author: SCS Global Services
Third Party Reviewer: James Salazar, Coldstream Consulting
Date: January 28, 2023

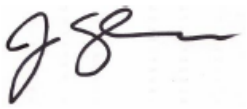
Coldstream Consulting recently completed a third-party review of SCS Global's *New Belgium Brewery Fat Tire® Amber Ale and Mountain Time® Lager, Dated January 25, 2023*. This statement summarizes the outcome of the review. Our detailed findings and recommendations were submitted to SCS Global Services in a separate "checklist" document that considered the conformance of the report to the requirements of the reference standard: *Greenhouse Gas Protocol: Product Life Cycle Accounting and Reporting Standard, September 2011*.

Level of Assurance: We are able to assign a reasonable assurance to the carbon footprint results Fat Tire® Amber Ale and Mountain Time® Lager based on the document provided for review. The project report clearly documented the system model, including all data sources and assumptions, and results. We found that the project report contained sufficient appropriate evidence for us to conclude that the carbon footprint conforms in all material respects with the WRI GHG Protocol for Products.

Independence and Competence: Coldstream Consulting is an independent third party with no affiliation to the project proponents beyond serving as an external reviewer. Coldstream Consulting are considered leaders in the field of product life cycle assessment and carbon footprinting and have conducted hundreds of such studies and reviews over the past 10 years.

Assurance process: Coldstream Consulting first prepared a checklist of all requirements in the reference standard: *Greenhouse Gas Protocol: Product Life Cycle Accounting and Reporting Standard, September 2011*. SCS then provided Coldstream Consulting with a draft report which we reviewed against the standard for conformance. The modeling parameters were also considered against similar research and known data sources to ensure the feasibility of the results.

Third Party Reviewer:



James Salazar

Phone: 250-306-0638 Email: james.salazar@coldstreamconsulting.com

Coldstream Consulting

Appendix C: Qualifying explanatory statements (QES) checklists

In accordance with PAS 2060: 2014 requirements, the QES checklist to support declaration of commitment to carbon neutrality is provided in the table below.

Table C1. Checklist for QES supporting declaration of commitment to carbon neutrality (based on Table B.1 of the PAS 2060: 2014 standard).

QES Checklist Requirements	Response
1) Identify the individual responsible for the evaluation and provision of data necessary for the substantiation of the declaration including that of preparing, substantiating, communicating and maintaining the declaration.	Refer to Section 2
2) Identify the entity responsible for making the declaration.	Refer to Section 2
3) Identify the subject of the declaration.	Refer to Section 2
4) Explain the rationale for the selection of the subject.	Refer to Section 2
5) Define the boundaries of the subject.	Refer to Section 2
6) Identify all characteristics (purposes, objectives or functionality) inherent to that subject.	Refer to Section 2
7) Identify and take into consideration all activities material to the fulfilment, achievement or delivery of the purposes, objectives or functionality of the subject.	Refer to Sections 2 and 3
8) Select which of the 3 options within PAS 2060 you intend to follow.	Refer to section 2
9) Identify the date by which the entity plans to achieve the status of "carbon neutrality" of the subject and specify the period for which the entity intends to maintain that status.	Refer to section 2
10) Select an appropriate standard and methodology for defining the subject, the GHG emissions associated with that subject and the calculation of the carbon footprint for the defined subject.	Refer to section 2
11) Provide justification for the selection of the methodology chosen.	Refer to section 2
12) Confirm that the selected methodology was applied in accordance with its provisions and the principles set out in PAS 2060.	Refer to section 2
13) Describe the actual types of GHG emissions, classification of emissions (Scope 1, 2 or 3) and size of carbon footprint of the subject exclusive of any purchases of carbon offsets.	Refer to section 3
a) All greenhouse gases shall be included and converted into tCO2e.	Refer to section 3
b) 100% Scope 1 (direct) emissions relevant to the subject shall be included when determining the carbon footprint.	Refer to section 3. Scope categorization not applicable to product footprint
c) 100% Scope 2 (indirect) emissions relevant to the subject shall be included when determining the carbon footprint.	Refer to section 3. Scope categorization not applicable to product footprint.
d) Where estimates of GHG emissions are used in the quantification of the subject carbon footprint (particularly when associated with scope 3 emissions) these shall be determined in a manner that precludes underestimation.	Refer to section 3. Scope categorization not applicable to product footprint.
e) Scope 1, 2 or 3 emission source estimated to be more that 1% of the total carbon footprint shall be taken into consideration unless evidence can be provided to demonstrate that such quantification would not be technically feasible or cost effective.	Refer to section 3.
f) The quantified carbon footprint shall cover at least 95% of the emissions from the subject.	Refer to section 3.
g) Where a single source contributes more than 50% of the total emissions, the 95% threshold applies to the remaining sources of emissions.	No source contributes over 50% of emissions. Refer to section 3.
h) Any exclusion and the reason for that exclusion shall be documented.	Refer to section 3.

QES Checklist Requirements	Response
14) Where the subject is an organization/company or part thereof, ensure that:	Subject is not an organization.
a) Boundaries are a true and fair representation of the organization's GHG emissions (i.e., shall include all GHG emissions relating to core operations including subsidiaries owned and operated by the organization).	Subject is not an organization.
b) Either the equity share or control approach has been used to define which GHG emissions are included. Under the equity share approach, the entity accounts for GHG emissions from the subject according to its share of equity in the subject. Under the control approach, the entity shall account for 100% of the GHG emissions over which it has financial and/or operational control.	Subject is not an organization.
15) Identify if the subject is part of an organization or a specific site or location and treat as a discrete operation with its own purpose, objectives and functionality.	Subject is not an organization.
16) Where the subject is a product or service, include all Scope 3 emissions (as the lifecycle of the product/service needs to be taken into consideration).	Refer to section 3. Scope categorization not applicable to product footprint.
17) Describe the actual methods used to quantify GHG emissions (e.g. use of primary or secondary data), the measurement unit(s) applied, the period of application and the size of the resulting carbon footprint.	Refer to section 3.
18) Provide details of, and explanation for, the exclusion of any Scope 3 emissions.	Refer to section 3. Scope categorization not applicable to product footprint.
19) Document all assumptions and calculations made in quantifying GHG emissions and in the selection or development of greenhouse gas emission factors.	Section 3 and Appendix C
20) Document your assessments of uncertainty and variability associated with defining boundaries and quantifying GHG emissions including the positive tolerances adopted in association with emission estimates.	Section 3 and Appendix C
21) Document carbon footprint management plan:	Refer to section 4.
a) Make a statement of commitment to carbon neutrality for the defined subject.	Section 2 and 4.
b) Set timescales for achieving carbon neutrality for the defined subject.	Section 4.
c) Specify targets for GHG reduction for the defined subject appropriate to the timescale for achieving carbon neutrality including the baseline date, the first qualification date and the first application period.	Section 4.
d) Document the planned means of achieving and maintaining GHG emissions reductions including assumptions made and any justification of the techniques and measures to be employed to reduce GHG emissions.	Section 4.
e) Specify the offset strategy including an estimate of the quantity of GHG emissions to be offset, the nature of the offsets and the likely number and type of credits.	Section 4.5 and 6
22) Implement a process for undertaking periodic assessments of performance against the Plan and for implementing corrective action to ensure targets are achieved.	Section 1.
23) Where the subject is a non-recurring event such as weddings or concert, identify ways of reducing GHG emissions to the maximum extent commensurate with enabling the event to meet its intended objectives before the event takes place and include post event review to determine whether or not the expected minimization in emissions has been achieved.	Not applicable
24) For any reductions in the GHG emissions from the defined subject delivered in the period immediately prior to the baseline date and not otherwise taken into account in any GHG emissions quantification (historic reductions), confirm: • the period from which these reductions are to be included; • that the required data is available and that calculations have been undertaken using the same methodology throughout;	Not applicable

QES Checklist Requirements	Response
• that assessment of historic reduction has been made in accordance with this PAS, reporting the quantity of historic reductions claimed in parallel with the report of total reduction.	
25) Record the number of times that the declaration of commitment has been renewed without declaration of achievement.	Not applicable
26) Specify the type of conformity assessment: a) independent third party certification; b) other party validation; c) self-validation.	Other party validation
27) Include statements of validation where declarations of commitment to carbon neutrality are validated by a third party certifier or second party organizations	Validated by SCS Global Services (other party/second party)
28) Date the QES and have it signed by the senior representative of the entity concerned (e.g. CEO of a corporation; Divisional Director, where the subject is a division of a larger entity; the Chairman of a town council or the head of the household for a family group).	Section 2
29) Make QES publicly available and provide a reference to any freely accessible information upon which substantiation depends (e.g. via websites).	Final QES to be made publicly available via the New Belgium Brewing Company website
30) Update the QES to reflect changes and actions that could affect the validity of the declaration of commitment to carbon neutrality.	Not Applicable

Table C2. Checklist for QES supporting declaration of achievement to carbon neutrality (based on Table B.2 of the PAS 2060: 2014 standard).

QES Checklist Requirements	Response
1) Define standard and methodology used to determine its GHG emissions reduction	Beverage Industry Environmental Roundtable (BIER). (2019) "Beverage Industry Greenhouse Gas (GHG) Emissions Sector Guidance" in accordance with WRI GHG Protocol
2) Confirm that the methodology used was applied in accordance with its provisions and the principles set out in PAS 2060 were met.	Refer to Section 2
3) Provide justification for the selection of the methodologies chosen to quantify reductions in the carbon footprint, including all assumptions and calculations made and any assessment of uncertainty.	The methodology prescribed in the BIER guidelines aligns with WRI's Product Life Cycle Accounting and Report Standard and is specific to the product sector.
4) Describe the means by which reductions have been achieved and any applicable assumptions or justifications	Section 4.
5) Ensure that there has been no change to the definition of the subject.	Section 2 and 5
6) Describe the actual reductions achieved in absolute and intensity terms and as a percentage of the original carbon footprint.	Section 3
7) State the baseline/qualification date.	Section 5
8) Record the percentage economic growth rate for the given application period used as a threshold for recognizing reductions in intensity terms	section 3
9) Provide an explanation for circumstances where a GHG reduction in intensity terms is accompanied by an increase in absolute terms for the determined subject.	Section 3
10) Select and document the standard and methodology used to achieve carbon offset.	Section 6
11) Confirm that	

QES Checklist Requirements	Response
a) Offsets generated or allowance credits surrendered represent genuine, additional GHG emission reductions elsewhere	Section 6
b) Projects involved in delivering offsets meet the criteria of additionality, permanence, leakage and double counting.	Section 6
c) Carbon offsets are verified by an independent third party verifier.	Section 6
d) Credits from carbon offset projects are only issued after the emission reductions	Section 6
e) Credits from carbon offset projects are retired within 12 months from the date of the declaration of achievement	Section 6
f) Provision for event related option of 36 months to be added here	Not applicable
g) Credits from carbon offset projects are supported by publicly available project documentation on a registry which shall provide information about the offset project, quantification methodology and validation and verification procedures	Section 6
h) Credits from carbon offset projects are stored and retired in an independent credible registry	Section 6
12) Document the quantity or GHG emissions credits and the type and nature of credits actually purchased including the number and type of credits used and the time period over which credits were generated	
a) Which ghg emissions have been offset	Section 4 and 6.
b) The actual amount of carbon offset	Section 6
c) The type of credits and projects involved	Section 6
d) The number and type of carbon credits used and the time period over which the credits have been generated	Section 6
e) For events, a rationale to support any retirement of credits in excess of 12 months including details of any legacy emission savings, taken into account	Not applicable
f) Information regarding the retirement/cancellation of carbon credits to prevent their use by others including a link to the registry or equivalent publicly available record, where the credit has been retired	Section 6
13) Specify the type of conformity assessment	Other party validation , OPV-3
14) include statements of validation where declarations of achievement of carbon neutrality are validated by a third party certifier or second party organizations	Validated by SCS Global Services (other party/second party).
15) Date the QES and have it signed by the senior representative of the entity concerned	Section 4 of this document
16) Make QES publicly available and provide a reference to any freely accessible information upon which substantiation depends (e.g. via websites).	Final QES to be made publicly available via the New Belgium Brewing Company website