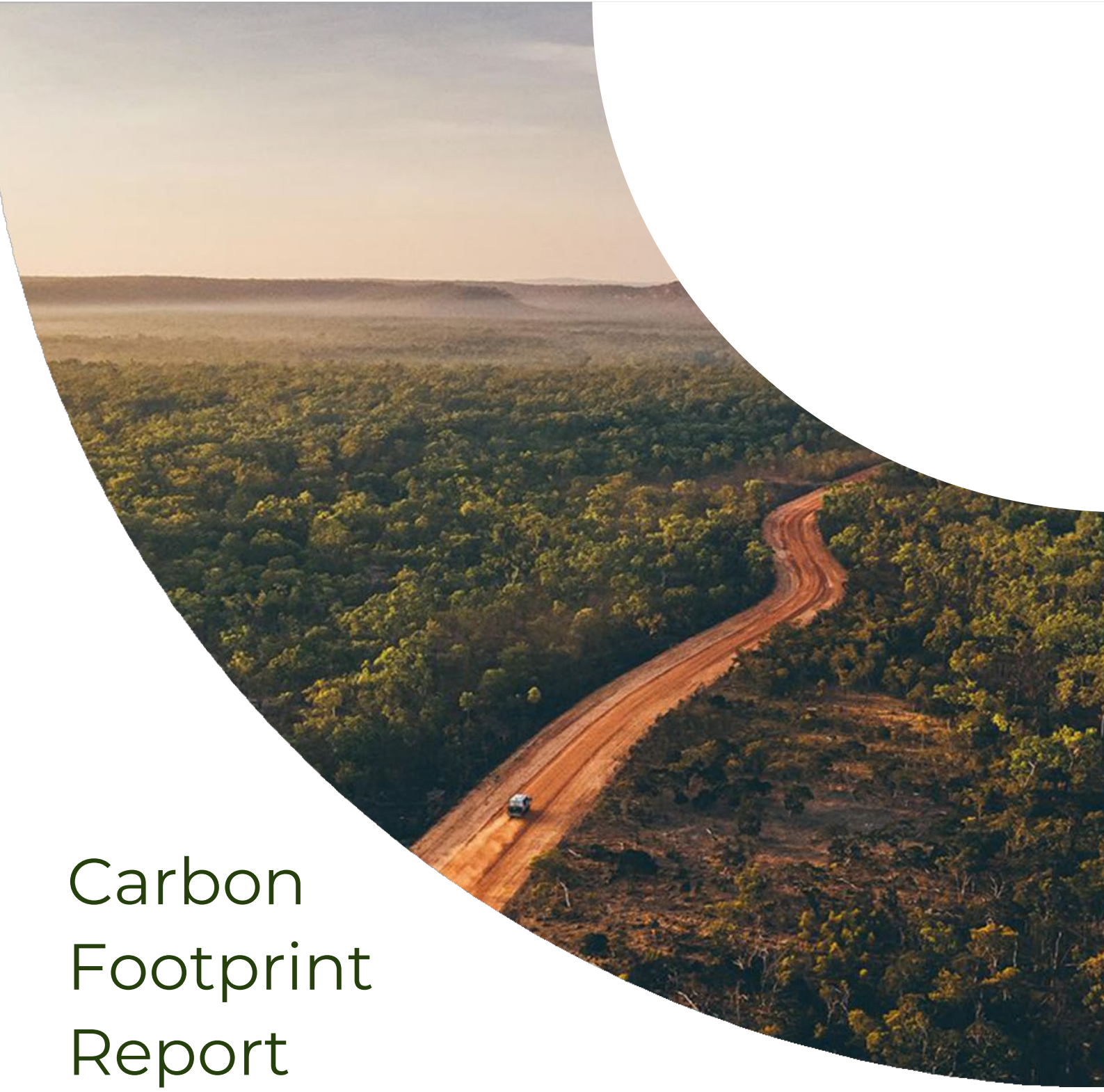

Carbon Footprint Report

Final Version

For **Rocky Ridge Brewing Co**

1 July 2023 to 30 June 2024

carbonneutral®

Carbon Neutral Pty Ltd

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Abbreviations

CH_4	Methane
CO_2	Carbon dioxide
CO_2-e	Carbon dioxide equivalent
COD	Chemical Oxygen Demand
DESNZ	Department for Energy Security & Net Zero (UK)
EF	Emission factor
EPiC	Environmental Performance in Construction
GHG	Greenhouse gas
GJ.	Gigajoule
kg	Kilogram
kL	Kilolitre
kWh	Kilowatt-hour
L	Litre
ML	Mega litre
N_20	Nitrous oxide
NGA	National Greenhouse Accounts
NGER	National Greenhouse and Energy Reporting Scheme
NO_x	Nitrogen oxides
PFC	Perfluorinated compound
p.km	Passenger kilometre
RFI	Radiative forcing index
RRBC	Rocky Ridge Brewing Co
SW	South west of Western Australia
t	Tonnes
t.km	Tonne kilometre
UK	United Kingdom
WBCSD	World Building Council for Sustainable Development
WRI	World Resources Institute
WTT	well to tank

Executive Summary

This Organisational Greenhouse Gas Inventory report has been prepared to assist Rocky Ridge Brewing Co (RRBC) measure and track its carbon footprint.

This document describes the calculation boundaries, calculation methodologies, assumptions, measurement results, and key references used to prepare the Financial Year 2024 (FY24) greenhouse gas (GHG) inventory.

Scope 1, 2 and 3 GHG emissions in RRBC's operations and value chain have been included.

RRBC's total organisational GHG emissions have been estimated at 874.75 tonnes of carbon dioxide equivalent (t CO_2-e) for the period 1 July 2023 to 30 June 2024.

This is a decrease on gross GHG emissions from FY23 (1,000.88 t CO_2-e).

After allowances for carbon neutral purchases in its supply chain, *net* GHG emissions prior to the retirement of any other offsets are estimated at 828.13 t CO_2-e.

The main GHG emitting activities were associated with purchased goods and services and stationary equipment fuel use.

30.9% of GHG emissions resulted from scope 1 (direct) activities. Scope 1 emitting activities arose from stationary and transport equipment fuel use and on-site wastewater disposal.

0% of GHG emissions were related to grid supplied electricity use at RRBC's TapHouse facility (scope 2) when determined using the market-based approach as 100% renewable energy is used at this facility. There are no scope 2 emissions for the brewery which is powered on renewable energy and batteries.

69.1% of gross GHG emissions resulted from Scope 3 activities associated with RRBC's supply chain.

A breakdown of scope 3 emissions is shown in Figure 1.

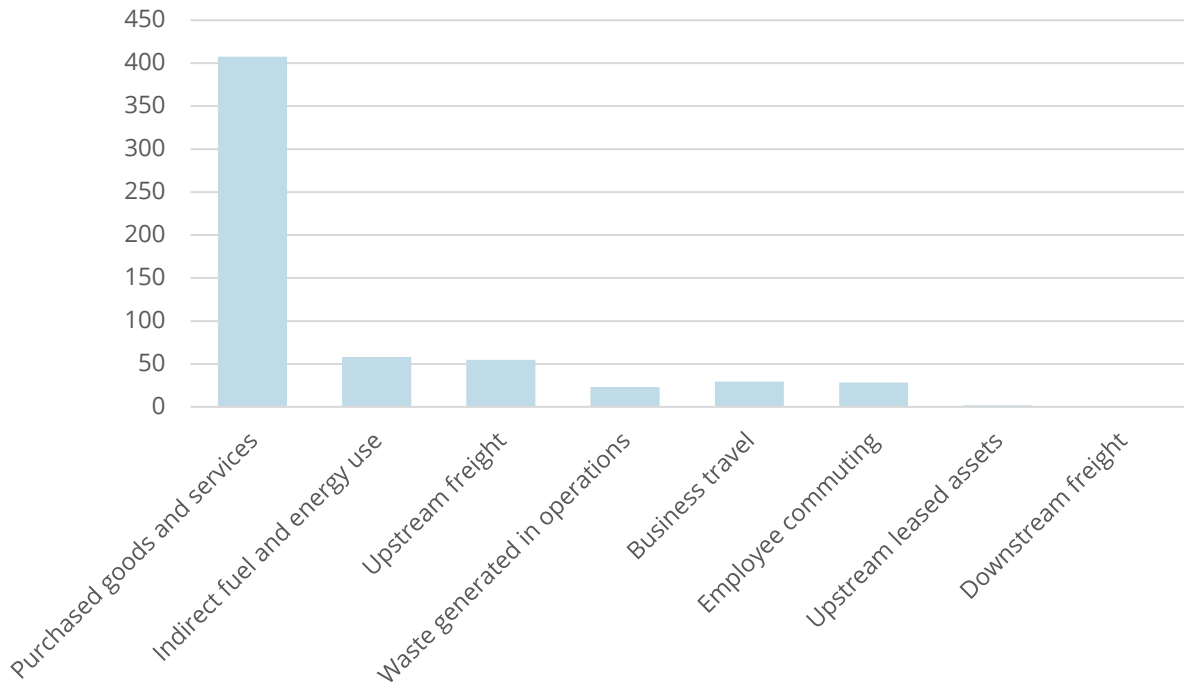

Figure 1 Summary of RRBC's scope 3 emissions - FY24 (t CO_2-e).

About Carbon Neutral

Carbon Neutral is a well-renowned Australian owned carbon solutions consultancy and offsets provider. We have over 23 years of experience and we have worked with over a thousand partners and organisations to deliver tangible climate change solutions.

Carbon Neutral assists organisations across Australia to minimise their impact on our environment by measuring, reducing and offsetting greenhouse gas emissions. Carbon Neutral is a market leader, has built a strong reputation within the low carbon economy and was the developer of the first web-based vehicle emissions calculator in Australia.

Carbon Neutral's services include Carbon Consulting and Reduction Programs, carbon calculators, retailing of carbon offsets, developing biodiverse reforestation projects, energy and water auditing, and Environmental Management System development and implementation. To date, Carbon Neutral has planted 30+ million trees in rural Australia.

Carbon Neutral is a long-standing, award-winning organisation that works with partners and businesses of all sizes to enrich landscapes, reduce the effects of climate crisis and deliver practical carbon solutions.

We are an independently certified (Climate Active) carbon neutral organisation.

About Rocky Ridge Brewing Co

Rocky Ridge Brewing Co (RRBC) is a family-owned business and producer of preservative free beer, made with predominantly locally sourced ingredients (Figure 2). The business is fiercely proud of growing the barley and the mjaority of hops used in its beer in an ecologically sustainable way.

Its core vision is one of sustainability and the business has implemented many practices to reduce its environmental footprint.

As well as the brewery, which is located on the family farm in Jindong, RRBC operates a cellar door/TapHouse in Busselton. It has a small head office located in shared facilities in West Leederville.

Mel and Hamish from RRBC continue to investigate opportunities to reduce emissions arising from business activities and as well as implementing carbon reduction measures on facilities that they operate, are keen to share and explore opportunities to engage with like-minded suppliers.

Emissions from previous reporting periods have been offset by the business using carbon offsets.

Figure 2 Rocky Ridge Brewing Company (courtesy RRBC website).

Organisational Boundary

RRBC's GHG emissions scope and organisational boundary have been determined in accordance with the GHG Protocol (World Business Council for Sustainable Development, World Resources Institute, 2004).

The boundary follows the ***operational control model*** and includes the aspects of RRBC's supply chain that they have influence over (see Figure 3). GHG emissions from the organisation have been included and reported on where activity data was captured and recorded.

The business is deemed to have had operational control over its brewery and TapHouse facilities during the reporting period.

Emissions associated with the operation of the family farm other than brewery operations are not included in the emissions boundary.

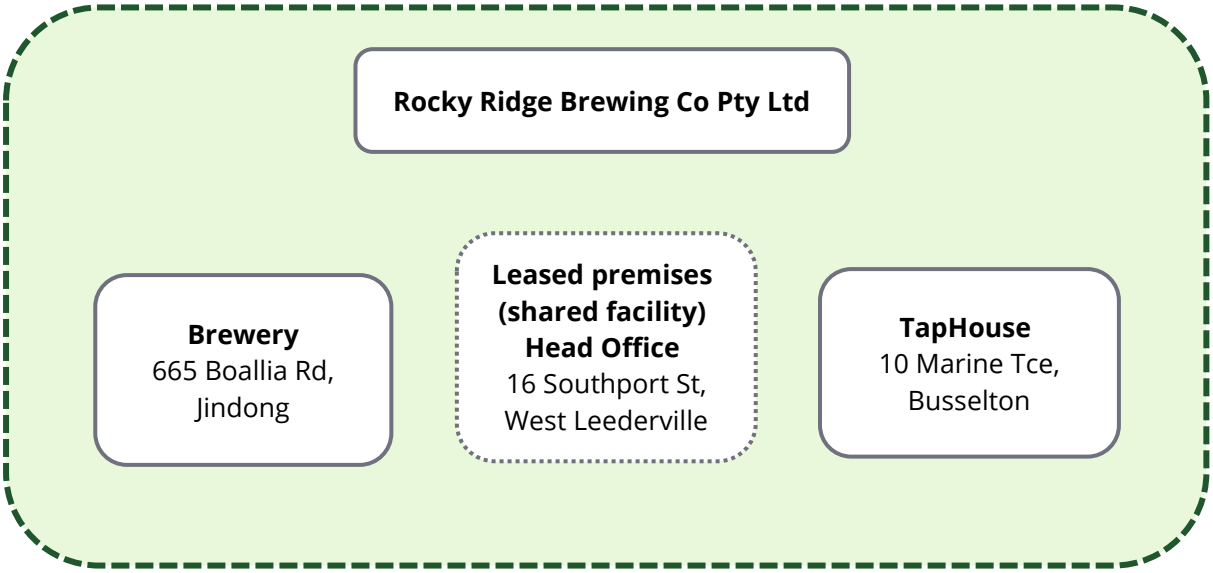

Figure 3 Organisational boundary of RRBC FY24 carbon footprint report.

Emissions Scope

The seven key greenhouse gas sources recognised by the IPCC have been considered in this assessment, and include:

+ Carbon dioxide (CO_2),
+ Methane (CH_4),
+ Nitrous oxide (N_20),
+ Hydrofluorocarbons (HFCs),
+ Perfluorocarbons (PFCs),
+ Sulphur hexafluoride (SF_6) and,
+ Nitrogen trifluoride (NF_3)

All different sources are included and reported on as units of carbon dioxide equivalents (CO_2-e). This provides the ability to compare various greenhouse gasses as a single unit.

Classification Method

The GHG Protocol categorises GHG emissions into three 'scopes' (see Figure 4).

Scope 1

Direct GHG emissions from operations owned or controlled by the reporting company, e.g. emissions from fuel consumed by equipment and vehicles and from on-site wastewater disposal.

Scope 2

Indirect emissions from the generation of purchased electricity or steam consumed by RRBC (e.g. indirect emissions from electricity consumption from the grid for TapHouse).

Scope 3

Other indirect emissions (not included in Scope 2) that occur in the value chain of RRBC.

Activities included in this GHG emissions inventory are shown in Figure 5.

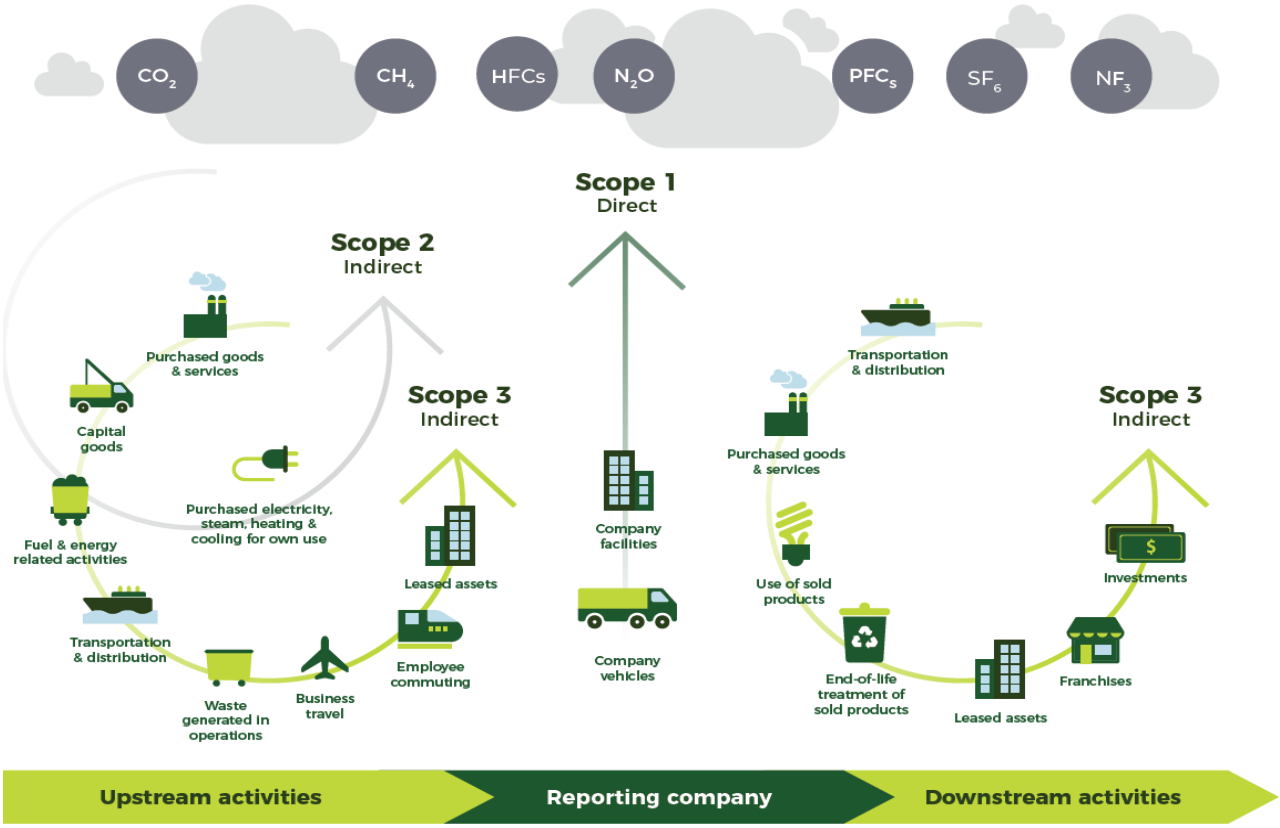

Figure 4 Diagram of scope of GHG emissions by source.

Emission Boundary

	Quantified	Excluded
Scope 1	Stationary fuel consumption	Refrigerant leaks (nil)
	Fleet fuel consumption	Fugitive (CO_2) emissions
	Wastewater disposal	
Scope 2	Electricity use	Imported steam (nil)
Scope 3	Purchased goods and services	Capital goods
	Indirect fuel and energy use	Processing of sold products
	Upstream freight	Use of sold products
	Waste generated in operations	End-of-life treatment of sold products
	Business travel	Downstream leased assets
	Employee commuting	Franchises
	Upstream leased assets	Investments
	Downstream freight	

Figure 5 Activities included in RRBC's FY24 emissions inventory.

Methodology, Data Sources & Assumptions

Except where otherwise stated, scope 1 and 2 emissions have been calculated using the methodology and emission factors presented by the Australian Government's Australian National Greenhouse Accounts (NGA) Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Scope 3 emissions are often more complicated to quantify due to their varied and indirect nature. For scope 3 emissions, a variety of sources have been used, with methodologies following the guidance of the GHG Protocol Corporate Value Chain (Scope 3) Standard.

Calculation methodologies specific to each emission category are referenced in the corresponding category sections in this report and appendices.

Calculation methodologies include the Supplier-Specific Method, Hybrid Method, Average-Product Method and Average-Spend Method. The main reference sources include the NGA Factors, UK government's GHG Conversion Factors for Company Reporting (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023), and the University of Melbourne's Environmental Performance in Construction (EPiC) database (Crawford, 2019).

Where the Economic Input-Output methodology was used, Carbon Neutral considered inflation and used the Reserve Bank of Australia's inflation calculator (Reserve Bank of Australia, 2025)

Emissions are attributed to individual facilities and operations (brewing and retail TapHouse) using information provided by RRBC.

All activity data provided by RRBC is taken to be complete and accurate. Carbon Neutral did not independently verify the completeness or accuracy of this data.

Data Collection & Quality

Business activities outlined under the GHG Protocol Standard are reported against where relevant and where suitable activity data and emission factors are available.

Carbon Neutral endeavours to ensure that reliable and accurate data is used. All assumptions are outlined where appropriate.

The following process was followed:

1. Carbon Neutral provided RRBC with a list of data required to gather information about potential GHG emission activity sources.

2. RRBC provided Carbon Neutral with data relating to GHG emitting activities.

3. Carbon Neutral reviewed the supplied activity data and sought clarification of activity data where necessary to ensure that the complete, accurate and robust data was used.

4. Carbon Neutral applied suitable methodologies and emission factors to the supplied activity data to determine the organisational GHG emissions of RRBC for the reporting period.

5. Carbon Neutral calculated the GHG emissions of RRBC in accordance with the GHG Protocol Standard and AS ISO 14064.1 – 2018 Greenhouse gases Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

6. Carbon Neutral prepared this Organisational Greenhouse Gas Emissions Inventory (Carbon Footprint) Report for RRBC for the reporting period 1 July 2023 to 30 June 2024 (FY24).

The veracity of the data provided by RRBC is taken to be complete and accurate and has not been audited or independently verified.

A site visit of the locations was not conducted as part of this assessment.

Carbon Neutral acknowledges the assistance of Mel Holland, RRBC Co-Founder and Owner, for the provision of activity data and information relating to this report.

Total Emissions Summary

The total gross GHG emissions for RRBC for the Financial Year 2023/24 period have been estimated at **874.75 t CO_2-e**.

A breakdown of GHG emissions by scope is presented below in Table 1 and Figure 6.

Table 1 Total gross GHG emissions – FY24

GHG emissions scope	Emissions (t CO_2-e)	Percentage
Scope 1 Emissions	270.56	30.9%
Scope 2 Emissions	0	0.00%
Scope 3 Emissions	604.19	69.1%
Total Emissions	**874.75**	**100%**

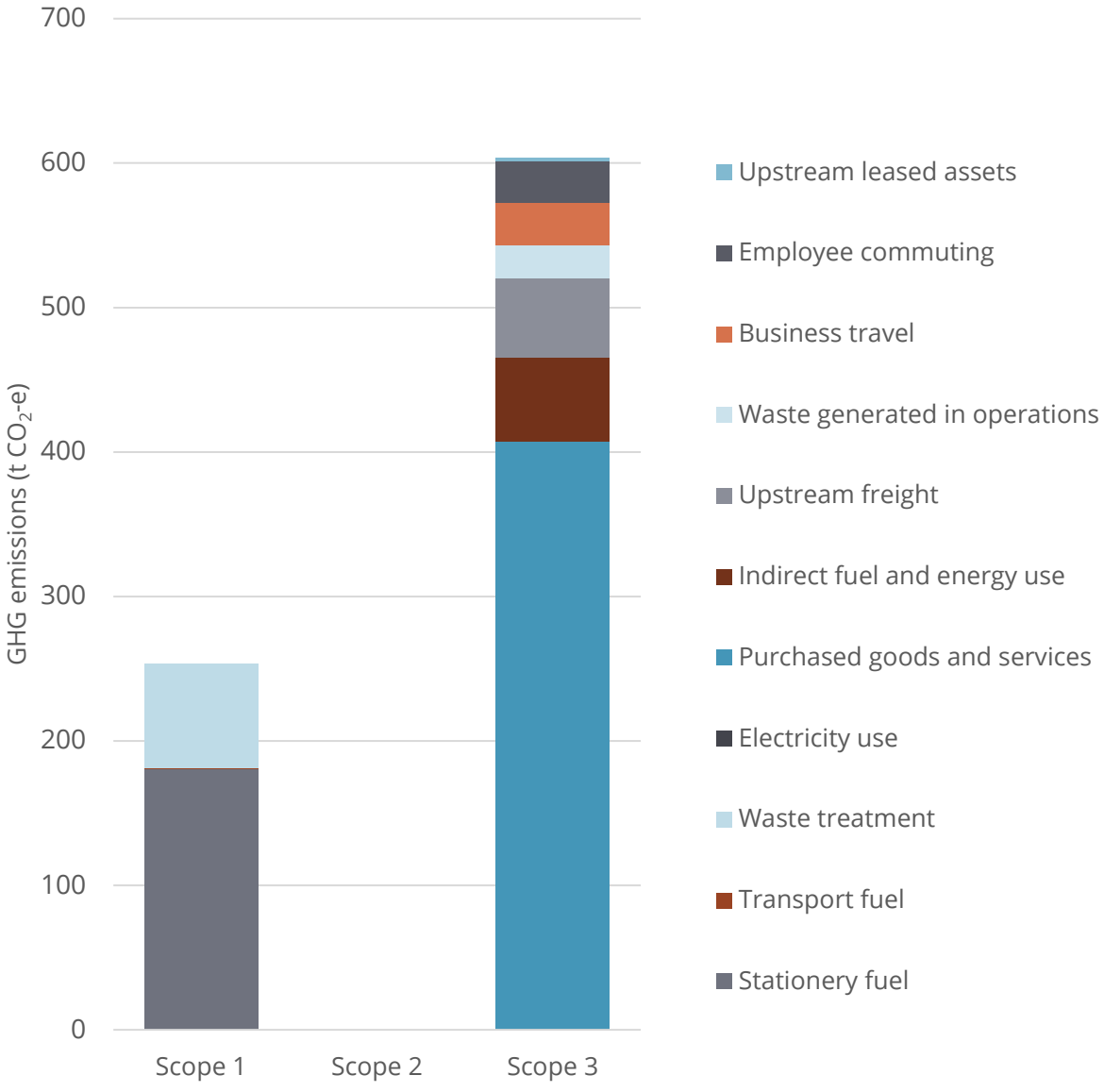

Figure 6 FY24 GHG emissions by scope for RRBC.

Scope 1 Emissions

Scope 1 GHG emissions are released directly from sources that are controlled or operated by RRBC. Scope 1 emissions for RRBC were estimated at **270.56 t CO_2-e.**

Table 2 Scope 1 emissions summary

Scope 1 activity	Quantity (kL)	CO_2 (t CO_2-e)	CH_4 (t CO_2-e)	N_2O (t CO_2-e)	Emissions (t CO_2-e)
Fuel Consumption (Stationary)		**179.29**	**0.45**	**0.56**	**180.30**
Diesel	*28.386*	*76.59*	*0.11*	*0.22*	*76.92*
LPG	*66.381*	*102.70*	*0.34*	*0.34*	*103.38*
Fuel Consumption (Transport)		**18.27**	**0.00**	**0.07**	**18.35**
Gasoline	*5.799*	*13.37*	*0.00*	*0.04*	*13.41*
Diesel	*1.818*	*4.90*	*0.00*	*0.04*	*4.94*
Wastewater (discharged on site)	2,928		**71.90**		**71.90**
Total Emissions Scope 1					**270.56**

Fuel consumption (Stationary & transport)

Diesel and LPG used in stationary equipment in the brewery.

Diesel and gasoline used in fleet vehicles.

Carbon Neutral used 2023 NGA emission factors (Department of Climate Change, Energy, the Environment and Water, August 2023) to estimate the total direct stationary fuel emissions for RRBC at **180.30 t CO_2-e** and total direct transport fuel emissions at **18.35 t CO_2-e**.

Table 3 Stationary equipment and transport fuel scope 1 emission factors for FY24

Fuel type	Energy content factor	Emissions factor			
		CO_2	CH_4	N_2O	Total
	(GJ/kL)	(kg CO_2 e/GJ)			
Stationary equipment					
Liquified petroleum gasoline	25.7	60.2	0.2	0.2	60.6
Diesel oil	38.6	69.9	0.1	0.2	70.2
Transport					
Gasoline	34.2	67.4	0.02	0.2	67.62
Diesel oil	38.6	69.9	0.01	0.5	70.41

(Department of Climate Change, Energy, the Environment and Water, August 2023)

Wastewater treatment

Wastewater generated from brewery operations and disposed of on site.

The volume of water disposed onto the farm was provided by RRBC.

Carbon Neutral used the default wastewater Chemical Oxygen Demand (COD) for beer sourced from the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Department of Industry, 2022) and the methodology from the Australian Greenhouse Office's Factors and Methods workbook (Australian Greenhouse Office, 2008) to estimate total on-site wastewater emissions for RRBC at **71.90 t CO_2-e.**

Table 4 Default wastewater emission factors

Default wastewater commodity type	$COD_{con,i}$
Beer (ANZSIC code 1212)	6.0

(Department of Industry, 2022)

Exclusions

Direct emissions associated with farm emissions have been excluded.

Emissions associated with composting of spent grains that are reapplied to the farm have also been excluded from emissions calculations.

Emissions calculations exclude CO_2 produced from fermentation during the beer making process. A lot of the carbon dioxide from fermentation is captured and re-used for carbonation.

Scope 2 Emissions

Scope 2 emissions are indirect GHG emissions associated with imported electricity use.

Scope 2 emissions are relevant for the TapHouse facility only. 70% of the usage at the facility has been assigned to RRBC operations with the remaining 30% assigned to the operation of a third party kitchen service which is outside the boundary of this assessment.

No imported electricity is used at the brewery which is powered by a solar PV and battery backup system.

Emissions from electricity use at the shared, leased head office have been reported as a scope 3 emission under upsteam leased assets. RRBC does not have operational control over this facility and sub-metered electricity usage was not available.

The GHG indirect emissions from electricity use for RRBC were estimated at 20.11 t CO_2-e for FY24 when determined using the location-based method.

When determined using the market-based method, there are no emissions associated with electricity use *as 100% renewable energy (Greenpower and solar PV) is used at facilities operated by the business.*

Table 5 Scope 2 emissions summary (location-based method) – TapHouse – FY24

GHG emissions – Scope 2	Quantity (kWh)	Emissions (t CO_2-e)
Electricity use	37,945	20.11

Electricity use

Imported electricity used in facilities controlled by the organisation.

Calculation methodology

Carbon Neutral used 2023 NGA emission factors to estimate imported electricity emissions for the business. Both the location-based method as well as the market-based method have been used to estimate GHG emissions associated with purchased electricity use.

The location-based method shows a company's electricity emissions in the context of its location. It calculates the emissions from a company's electricity consumption, reflecting the emissions intensity of electricity generation within the state or territory where it operates. They are state-based emission factors from on-grid electricity generation, calculated from the physical characteristics of the electricity grid.

The market-based method shows a company's electricity emissions in the context of its investments in different electricity products and markets. This includes from voluntary purchases of renewable energy.

The market-based method assigns an emissions factor of zero for a company's investments in renewable electricity and uses a national residual mix factor to calculate emissions from any remaining electricity consumption. (Australian Government, Department of Climate Change, Energy, the Environment and

Water, 2024).

Net emissions from imported electricity use for RRBC for the FY24 period are taken to be **zero t CO_2-e when determined using the market-based approach.**

Table 6 Purchased electricity use emission factors (location-based) – TapHouse – FY24

State or Territory	Scope 2 EF (kg CO_2-e /kWh)	Scope 3 EF (kg CO_2-e /kWh)
Southwest Interconnected System (SWIS) in WA	0.53	0.04

(Department of Climate Change, Energy, the Environment and Water, 2024)

Scope 3 Emissions

The GHG protocol (GHG Protocol, Carbon Trust & WRI, 2013) identifies Scope 3 emissions as upstream and downstream emissions, based on the financial transactions of the reporting company.

+ **Upstream emissions** are indirect GHG emissions related to purchased or acquired goods and services.
+ **Downstream emissions** are indirect GHG emissions related to sold goods and services.

The GHG Protocol Scope 3 Standard further divides Scope 3 emissions into fifteen distinct categories. Scope 3 emissions inventory calculations are presented according to these categories.

Where it enhances relevance and transparency or where particular emissions sources are deemed critical by RRBC, Carbon Neutral further disaggregated this data.

Guidance on the inclusion of Scope 3 emission sources is further provided by Corporate Value Chain Accounting and Reporting Standard (World Resources Institute; World Business Council for Sustainable Development, 2011)

The gross indirect emissions of all Scope 3 categories were estimated at **604.19 t CO_2-e** for FY24 (see Figure 7).

The most significant contribution to Scope 3 emissions in RRBC value chain came from Purchased Goods and Services.

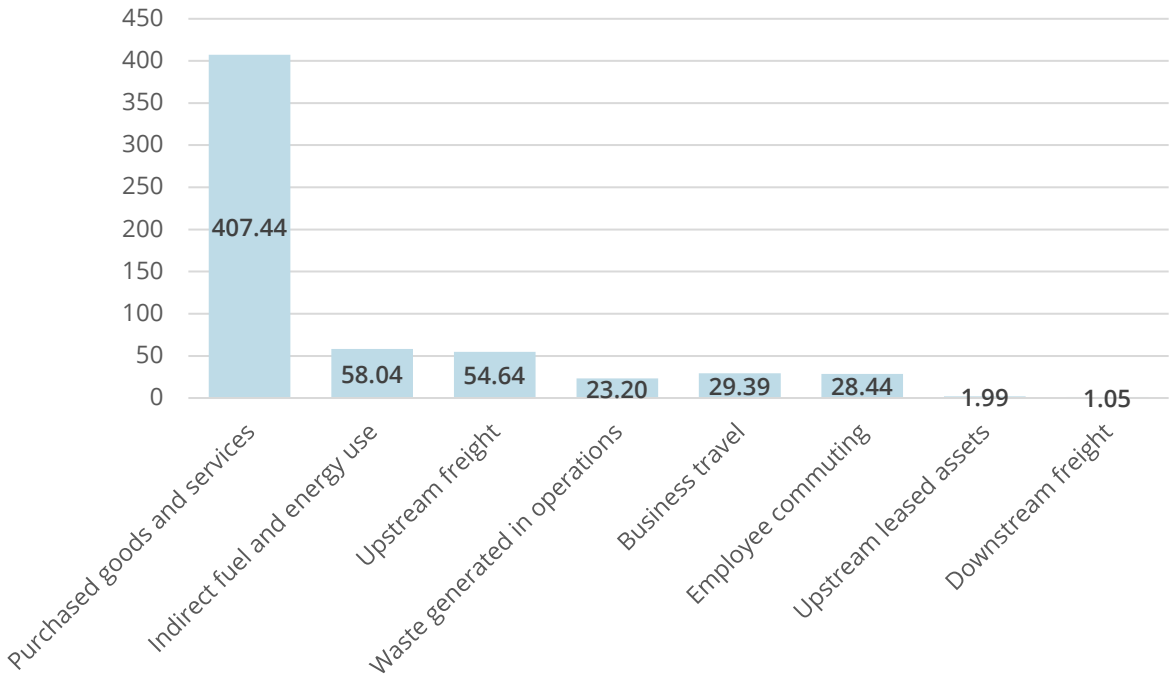

Figure 7 FY24 Scope 3 emissions by activity for RRBC, (t CO_2-e).

Scope 3 Emissions Summary

Table 7 FY24 Scope 3 gross GHG emissions by activity and location

Scope 3 GHG emissions category		Emissions (t CO_2-e)		
		Brewery	TapHouse	Total
	Upstream emissions			
1	Purchased goods and services	343.31	64.14	407.44
2	Capital goods	-	-	-
3	Indirect fuel and energy use	58.04	0.00	58.04
4	Upstream freight	52.32	2.32	54.64
5	Waste generated in operations	6.75	16.45	23.20
6	Business travel	29.34	0.05	29.39
7	Employee commuting	27.55	0.89	28.44
8	Upstream leased assets	1.99		1.99
	Downstream emissions			
9	Downstream freight	1.05	-	1.05
10	Processing of sold products	-	-	-
11	Use of sold products	-	-	-
12	End-of-life treatment of sold products	-	-	-
13	Downstream leased assets	-	-	-
14	Franchises	-	-	-
15	Investments	-	-	-
	Total emissions Scope 3	**520.34**	**83.85**	**604.19**

Scope 3 Standard Emissions Categories

Category 1: Purchased goods and services		
Category description	Upstream (i.e., cradle-to-gate) GHG emissions from the production of products purchased or acquired by RRBC in FY24. This includes both goods (tangible products) and services (intangible products).	
	Gross emissions ($t CO_2$-e)	**Net emissions ($t CO_2$-e)**
Brewery	343.31	313.07
TapHouse	64.14	63.94
Total	**407.44**	**377.00**

Calculation boundary

This category covers emissions embodied within products and purchased by the business.

Materials used for packaging, ingredients (malt, hops, yeasts, extracts, syrups and fruit based flavourings), equipment and chemical purchases, marketing material and consumable purchases were included.

Calculation methodology

A variety of methods were used to determine emissions from Purchased Goods and Services depending on the availability of data.

The 'spend-based' method was used to calculate some emissions, with industry-average emission factors applied, based on the economic value of the goods and services.

The relevant economic sector emission factors from the EPiC database were then applied to calculate the overall emissions estimate for this category (Crawford, 2019).

For the purchase of bar mats in US dollars, US EPA emission factors have been used with an adjustment for inflation based on information from the US Bureau of labor Statistics.

Emission factors associated with the use of water and disposal of sewage are obtained from the Australian Bureau of Meteorology Department's National Performance Report 2022/23: Urban Water Utilities Dataset (BoM, 2023).

Emissions associated with packaging and some ingredients, inputs and other goods are determined using the mass of input materials where the weight of material by type was provided.

Emission factors are obtained from a variety of sources including industry publications, published life cycle assessment studies, and government sources. See Appendix A for a more detailed breakdown of emissions by type of good or service.

Category 2: Capital goods			
Category description	GHG emissions generated upstream of RRBC operations associated with the extraction, production and transportation of capital goods purchased or acquired.		
		Emissions (t CO_2-e)	**Not quantified**

Not Quantified

RRBC did not report any capital equipment purchases and no emissions associated with capital equipment purchases have been included.

Category 3: Indirect fuel and energy use		
Category description	Indirect GHG emissions from extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling. It also includes indirect emissions from the transmission and/or distribution of those resources.	
Brewery		
Fuel	**Usage (kL)**	**Emissions (t CO_2-e)**
Diesel (non-transport)	28.386	18.96
LPG (non-transport)	66.381	34.46
Diesel (transport)	1.818	1.21
Gasoline (transport)	5.533	3.41
Sub total - Brewery		***58.04***
TapHouse		
Electricity	**Usage (kWh)**	**Emissions (t CO_2-e)**
Electricity - SWIS (market-based)	37,945	0.00
Electricity – Residual mix (location-based)	37,945	1.52
Total (market-based electricity) - TapHouse		**58.04**
Total (location-based electricity) - TapHouse		**59.56**

Calculation boundary

This category covers emissions embodied within products and purchased by the business.

Materials used for packaging, ingredients (malt, hops, yeasts, extracts, syrups and fruit based flavourings), equipment and chemical purchases, marketing material and consumable purchases were included.

All fuel consumption (operations of stationary machinery and fleet) and grid purchased electricity were included in gross GHG emission calculation.

When determined using the location-based approach, GHG emissions associated with electricity used in the TapHouse facility are calculated at 1.52 t CO_2-e.

As GreenPower is used, net GHG emissions associated with indirect electricity emissions are zero when determined using the market-based approach.

Calculation methodology

Carbon Neutral used the average-data method to calculate emissions from this category, which involves estimating emissions using secondary (e.g., industry average) emissions factors for upstream emissions per unit of consumption.

Carbon Neutral used 2023 NGA emission factors to estimate indirect fuel and energy emissions for (Table 8).

Table 8 Stationary equipment and transport fuel scope 1 emission factors (by volume)

Fuel type	Energy content factor (GJ/kL)	Emissions factor (kg CO_2 e/GJ)
Stationary equipment		
Liquified petroleum gasoline	25.7	20.20
Diesel oil	38.6	17.30
Transport		
Gasoline	34.2	17.20
Diesel oil	38.6	17.30
Electricity	Scope 3 EF location-based (kg CO_2-e /kWh)	Scope 3 EF market-based (kg CO_2-e /kWh)
Southwest Interconnected System (SWIS) in WA	0.04	0.01

(Department of Climate Change, Energy, the Environment and Water, August 2023)

Category 4: Upstream freight	
Category description	GHG emissions from the transportation and distribution of products purchased by the reporting company in the reporting year between the company's suppliers and its operations. It includes third-party transportation and distribution services *purchased* by the reporting company, including inbound logistics, outbound logistics and third-party transportation and distribution between a company's own facilities as well as its customers.

Freight type	Gross emissions (t CO_2-e)	Net emissions (t CO_2-e)
Brewery		
Inbound freight	31.37	30.84
Outbound freight	20.95	19.89
Sub-total	***52.32***	***50.73***
TapHouse		
Inbound freight	2.32	2.32
Total	**54.64**	**53.05**

Calculation boundary

This category includes emissions from transportation and distribution of products purchased by RRBC, between their tier 1 suppliers and its operations (in vehicles and facilities not owned or controlled by RRBC).

All incoming and outgoing freight, where the cost of services was paid for by RRBC and not their clients, has been included.

Calculation Methodology

Carbon Neutral used, where possible, the weight and distance-based method (tonne.km) to calculate emissions from this category. This involved determining the weight, distance, and transport method for each freight movement; then applying the appropriate mass-distance emission factor for the vehicle using DESNZ emission factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

For some local deliveries, where the weight of freight was not recorded, whole delivery vehicle emissions were used based on a distance (km) travelled; then applying the appropriate distance-based emission factor for the vehicle using DESNZ emission factors.

Where the weight of freight was not recorded for some Leeuwin freight movements, an emission factor of 0.118 kg CO_2-e / $ was used to estimate emissions, based on freight cost. This emission factor was determined by calculating the average emissions per dollar expenditure of freight movements where both the weight and distance of shipments could be determined during quarter 1 (Jul – Dec 24) of the reporting period.

A more detailed breakdown of freight movements can be found in Appendix B.

Category 5: Waste generated in operations	
Category description	GHG emissions associated with waste treatment in facilities owned or operated by third parties.

Facility	Weight (tonnes/litres)	Emissions (t CO_2-e)
Brewery general waste	5.191	6.75
TapHouse general waste	6.545	15.99
TapHouse wastewater	427.5	0.45
	Total	**23.20**

Calculation boundary

This category included all emissions that resulted from waste generated in business operations and sent to landfill in FY24.

This category also includes emissions associated with wastewater from TapHouse operations sent offsite for disposal.

Materials separated and sent for recycling or re-use are excluded from the emissions inventory. By recycling cardboard and diverting this away from landfill, 20.56 t CO_2-e of GHG emissions have been avoided by the business. The emissions avoided do not allow for any emissions generated from the recycling process.

Calculation methodology

The weight of waste materials sent to landfill from the brewery was provided for brewery operations.

An emission factor for co-mingled commercial and industrial waste, 1.3 t CO_2-e/t waste, was used to estimate emissions (Department of Climate Change, Energy, the Environment and Water, August 2023).

For the TapHouse, the volume of waste generated for the year was based on three full 240 litre mobile garbage bins being collected weekly. A volume to weight conversion factor of 0.329 t/m^3 was applied based on the default waste stream percentage for waste mix types from the Commonwealth's NGER Determination (Department of Industry, 2022).

Category 6: Business travel			
Category description	GHG emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties, such as aircraft, trains, buses, and passenger cars.		
Brewery			
Land and air travel			
By distance	**Distance (p.km)**	**EF (kg CO_2-e/km)**	**Emissions (t CO_2-e)**
Vehicles	7,890	0.238	1.88
Domestic flight	1,983	0.194	0.39
Short haul economy flight	83,122	0.130	10.84
International economy flight	34,380	0.096	3.30
By fuel use	**Volume (kL)**	**EF (t CO_2-e/kL)**	**Emissions (t CO_2-e)**
Vehicles - diesel	3.295	3.39	11.16
Accommodation	**Room nights**	**EF (t CO_2-e/room)**	**Emissions (t CO_2-e)**
Brisbane	6	27.89	0.17
Ho Chi Minh	6	71.81	0.43
Gold Coast (Australia average used)	9	29.44	0.27
Melbourne	26	29.14	0.76
Nelson (NZ average used)	10	7.95	0.08
Perth	3	24.28	0.07
Subtotal - Brewery			**30.86**
TapHouse			
Land and air travel			
By distance	**Distance (p.km)**	**EF (kg CO_2-e/km)**	**Emissions (t CO_2-e)**
Vehicles	200	0.247	**0.05**
Total			**29.39**

Calculation boundary

This category included all emissions that resulted from business related travel in FY24 for RRBC.

This includes road as well as air travel by staff for business-related purposes and the use of accommodation during business related trips.

Calculation methodology

Details of work-related travel including vehicles used were obtained by staff survey and an estimate made of fuel consumed for these trips.

Where staff are provided with fuel cards to pay for fuel used for business related purposes, the volume of fuel (diesel) purchased was obtained from supplier spreadsheets.

Emissions from private vehicle use were determined using NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Emissions from flights are determined using DESNZ Factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

For air travel, no allowance has been made for radiative forcing index.

Emissions associated with accommodation are determined using emission factors from the Cornell Hotel Sustainability Benchmarking Index 2023 (Greenview, 2023).

All flights are carbon offset at the time of booking so net emissions associated with flights are taken to be zero.

Emission factors and business-related travel allowances are shown in Appendix C.

Total gross GHG emissions of category 6 were calculated at 29.39 t CO_2-e.

After allowances for carbon offset flights, net GHG emissions of category 6 are calculated at 14.86 t CO_2-e.

Category 7: Employee commuting	
Category description	GHG emissions from the transportation of employees between their homes and their worksites. Emissions from employee commuting may arise from private vehicle travel, bus travel, rail travel and/or air travel.

Brewery

	Distance (km)	Fuel used (litres)	Emissions (t CO_2-e)
Private vehicle – petrol	52,175	3,881	11.26
Private vehicle – diesel	46,457	4,804	16.27
Private vehicle – electric	259	40 (Wh electricity)	0.02
subtotal - Brewery	***98,891***		***27.55***

TapHouse

	Distance (km)	Fuel used (litres)	Emissions (t CO_2-e)
Private vehicle – petrol	4,370	283	0.82
Uber	400		0.07
Walk / cycle	2,190		-
subtotal – TapHouse	***6,960***		***0.89***
Total	**105,851**		**28.44**

Calculation boundary

Calculation for emissions of employee commuting arise from the commute from home to work and return. This excludes casual staff working for RRBC.

Emissions from staff working from home during FY24 were not considered significant and are not included.

Calculation methodology

Staff surveys were conducted to obtain details of the mode of transport to and from work and details of vehicles used.

Where staff did not know their vehicle's fuel efficiency, these were determined by reviewing the Green Vehicle Guide (Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts, 2025) and using combined fuel consumption data.

Vehicle efficiency and the distance travelled were used to determine fuel consumption for commuting in private vehicles and emissions from private vehicle use determined using NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Uber / taxi emission factors are sourced from the UK conversion factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

Emission factors and commuting allowances are shown in Appendix D.

Category 8: Upstream leased assets	
Category description	GHG emissions from the operation of assets that are leased by RRBC. This category is applicable only to companies that operate leased assets (i.e., lessees).

	GJ	Emissions (t CO_2-e)
Head office (shared facility)	12.6	**1.99**

Calculation boundary

This category included facilities used by RRBC that are not deemed to be under the operational control of the business and includes the energy used in its head offices (30m^2) in West Leederville.

Calculation methodology

Metered electricity consumption was not available for RRBC's head office which is shared with other entities.

The 2022 Commercial Building Baseline Study was used to estimate electricity used in this facility. The average electrical energy intensity for offices in WA was used (420 MJ/sqm.a) to estimate electricity use at 12.6GJ for the year (Strategic Policy Research, 2022).

Emissions factors are obtained from the NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023). An emission factor of 158 kg CO_2-e/GJ was used (location-based scope 2 and 3 combined emission factor).

Category 9: Downstream freight	
Category description	GHG emissions from the transportation and distribution of sold products in vehicles and facilities not owned or operated by the reporting company. It excludes third-party transportation and distribution services purchased by the reporting company and not paid for by customers.

Export shipments	Details	Emissions (t CO_2-e)
Sea freight	3 x shipments	1.05
	Total	**1.05**

Calculation boundary

This category includes emissions from transportation and distribution of products sold by RRBC (in vehicles not owned or controlled by RRBC).

All outgoing sea freight where customers paid for the freight was included.

Calculation Methodology

Emissions from sea freight are provided by RRBC based on average data provided by Singapore Ports who provided an estimate of 0.35 t CO_2-e per shipment.

Category 10: Processing of sold products		
Category description	GHG emissions from the processing of sold intermediate products by third parties (e.g., manufacturers). Intermediate products are products that require further processing, transformation, or inclusion in another product before and therefore result in emissions from processing after sale and before use by the end consumer.	
	Emissions (t CO_2-e)	**Not quantified**

Not quantified

RRBC's main operation consists of producing beer for consumption. This is generally consumed and not subject to further processing.

No allowances have been made for emissions associated with using the beer as an input material for another product. These emissions are considered immaterial and not included in the emissions inventory.

Category 11: Use of sold products			
Category description	GHG emissions from the downstream use of goods sold by RRBC. RRBC scope 3 emissions from the use of sold products include the scope 1 and scope 2 emissions of end users. End users include both consumers and business customers that use final products.		
		Emissions (t CO_2-e)	**Not quantified**

Not quantified
No allowances have been made for any emissions associated with use of the product. This includes refrigeration to keep product cold as well as any release of CO2 used in the product for carbonation.

Category 12: End-of-Life treatment of sold products			
Category description	GHG emissions from the waste disposal and treatment of products sold by RRBC at the end of the product's life.		
		Emissions (t CO_2-e)	**Not quantified**

Not quantified
No allowances have been made for emissions associated with disposal of packaging materials (e.g. cardboard, aluminium, plastic ends etc). Cardboard and paper-based packaging is generally recyclable, and no emissions are emitted by inert materials such as aluminium and plastic sent to landfill.

Similarly, any emissions associated with washing equipment or premises used to serve the beer are not included in the emissions inventory.

Category 13: Downstream leased assets			
Category description	GHG emissions from the operation of assets that are owned by the reporting company (acting as lessor) and leased to other entities in the reporting year that are not already included in scope 1 or scope 2.		
		Emissions (t CO_2-e)	**Not-quantified**

Not Quantified

RRBC does not lease any premises to third parties. Therefore, this category is not applicable for the organisation.

Category 14: Franchises			
Category description	GHG emissions from the operation of franchises not included in scope 1 or scope 2. A franchise is a business operating under a license to sell or distribute another company's goods or services within a certain location.		
		Emissions (t CO_2-e)	**Not-quantified**

Not Quantified

RRBC does not have any franchisees. Therefore, this category is not applicable for the organisation.

Category 15: Investments			
Category description	GHG emissions associated with RRBC's investments, not already included in scope 1 or scope 2.		
		Emissions (t CO_2-e)	**Not-quantified**

Not Quantified

RRBC has not disclosed any investments. Therefore, this category is deemed not applicable for the organisation.

Emissions Intensity

Emissions intensity expresses GHG impact per unit of physical activity or unit of economic output. These metrics allow for more meaningful comparison of emissions between years, operations and organisations.

The carbon intensity of an organisation's footprint can be calculated by dividing emissions by a relevant measure of activity.

RRBC's main operations consist of beer production. As such, an emissions intensity has been calculated per litre of beer produced for FY2024 brewery operations. This is represented in Table 9. Additionally, Table 10 displays the emissions intensity of RRBC's brewery operations per employee.

Table 9 FY24 Organisational emissions intensity (per litre of beer produced)[1]

Emissions Intensity (per litre beer [produced)	Volume of beer produced (kL)	GHG Emissions (t CO_2-e)	GHG Emissions Intensity (kg CO_2-e/L)
FY2020	424	738.2	1.74
FY2021	730	835.3	1.14
FY2022 (Gross)	893	877.7	0.98
FY2022 (Net)	*893*	*853.06*	*0.86*
FY2023 (Gross)	1,133	919.07	0.81
FY2023 (Net)	*1,133*	*914.09*	*0.81*
FY2024 (Gross)	980	790.90	0.81
FY2024 (Net)	*980*	*745.59*	*0.76*

Table 10 FY24 emissions intensity (per FTE – excluding casual staff).

Emissions Intensity (per FTE)	FTE	GHG Emissions (t CO_2-e)	GHG Emissions Intensity (t CO_2-e/FTE)
FY2020	7	738.2	105.5
FY2021	18	835.3	46.4
FY2022 (Gross)	25	877.7	35.1
FY2022 (Net)	*25*	*853.06*	*34.1*
FY2023 (Gross)	24	919.07	38.3
FY2023 (Net)	*24*	*914.09*	*38.1*
FY2024 (Gross)	18.2	790.90	43.5
FY2024 (Net)	*18.2*	*745.59*	*41.1*

[1] Includes brewery emissions only

Historical GHG Emissions

Table 11 Historical Gross GHG emissions by activity – FY2020 to FY2024.

	GHG Emissions (t CO_2-e)				
Activity	**FY2020**	**FY2021**	**FY2022**	**FY2023**	**FY2024**
Scope 1 – Direct					
Stationary equipment fuel use	93.6	184.2	211.9	216.3	180.3
Transport fuel use	27.7	2.4	-	28.2	18.4
Other emissions	52.3	84.2	66.1	69.5	71.9
Scope 2 – Indirect (electricity)[2]	27.6	22.0	8.0	0.0	0.0
Scope 3 – Indirect (other)					
1 – Purchased goods & services	338.3	405.2	422.3	366.9	407.4
2 – Capital goods	-	-	-	-	-
3 – Indirect fuel & energy use	8.3	10.9	12.0	71.8	58.0
4 – Upstream freight	136.6	37.3	59.6	110.7	54.6
5 – Waste generated in operations	3.5	16.3	12.4	6.6	23.2
6 – Business travel	17.7	17.7	32.0	17.9	29.4
7 – Employee commuting	4.9	20.7	27.6	26.8	28.4
8 – Upstream leased assets	18.3	9.1	3.8	2.2	2.0
9 – Downstream freight	9.5	25.3	21.9	2.1	1.1
10 – Processing of sold products	-	-	-	-	-
11 – Use of sold products	-	-	-	-	-
12 – End-of-life treatment of sold products	-	-	-	-	-
13 – Downstream leased assets	-	-	-	-	-
14 – Franchises	-	-	-	-	-
15 – Investments	-	-	-	-	-
Total	**738.2**	**835.3**	**835.3**	**919.1**	**874.7**

[2] Determined using the market-based approach from FY24 onwards

Emissions by Operation

RRBC comprises of two separate operations, each with its own facility. This includes its brewing operations as well as its TapHouse licensed venue.

Emissions by brewery and TapHouse operations can be seen in the following table. Emissions associated with RRBC's head office are assigned to its brewing operations in this table.

Gross GHG emissions by facility can be seen in the following diagram.

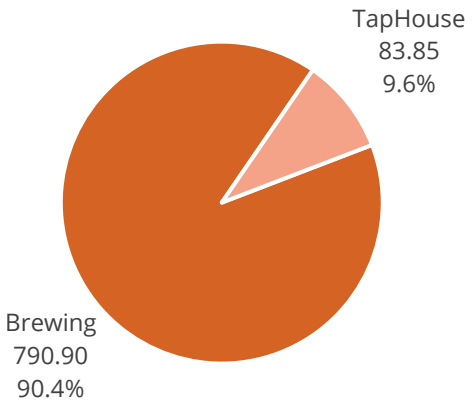

Figure 8 FY24 Scope 3 emissions by facility (t CO_2-e, %).

Table 12 Gross GHG emissions by operation FY24

	GHG Emissions (t CO_2-e)	
Activity	**Brewing**	**TapHouse**
Scope 1 – Direct		
Stationary equipment fuel use	180.30	-
Transport fuel use	18.35	-
Wastewater	71.90	-
Scope 2 – Indirect (electricity) – market-based method		0.00
Scope 3 – Indirect (other)		
1 – Purchased goods and services	343.31	64.14
3 – Indirect fuel and energy use	58.04	0.00
4 – Upstream freight	52.32	2.32
5 – Waste generated in operations	6.75	16.45
6 – Business travel	29.34	0.05
7 – Employee commuting	27.55	0.89
8 – Upstream leased assets	1.99	-
9 – Downstream freight	1.05	-
Total	**792.42**	**83.85**

Carbon Reduction Opportunities

The business has already implemented several measures which reduce their emissions.

This includes:

+ Using 100% off grid solar power with battery storage for its brewery operations.
+ Using rainwater and groundwater in its brewery operations.
+ Capturing CO_2 from fermentation operations to carbonate product.
+ Utilising cardboard packaging holders for 4 packs and cartons instead of plastic.
+ Using biodegradable and plant-based packaging where possible.
+ Using aluminium packaging as opposed to glass to reduce the weight of materials transported and to increase recyclability of sold product.
+ Using spent grain as animal fodder.
+ Composting of spent trub from brewery operations.
+ Reducing traditional water input to 3.5L/1L of beer produced, down from industry average of 6-10L water/1L of beer.
+ Seeking input products from local sources where possible, with preference given to SW producers.
+ Seeking to partner with supply chains that are managing their footprint or like-minded e.g. Certified Sustainable Malt Project (regeneratively grown malt, locally supplied, fully traceable).
+ Recycling waste-paper and other materials after use where possible.
+ Purchasing 100% renewable energy for its TapHouse operations.
+ Offsetting some flights at the time of booking.
+ Using carbon neutral certified paper.
+ Using carbon neutral Australia Post parcel delivery for some outgoing freight.

Carbon Neutrality

Before claiming organisational "carbon neutrality", RRBC has sought opportunities to reduce its avoidable GHG emissions as much as possible. Carbon offsets can be purchased and retired to account for its remaining net emissions.

RRBC's gross organisational carbon footprint for FY24 is estimated at 874.75 t CO_2-e, a reduction on its FY23 estimate of 1,000.88 t CO_2-e.

Its direct scope 1 emissions reduced from 314.0 to 270.6 t CO_2-e, realised through reductions in fuel used in stationary and transport equipment.

After allowances for carbon neutral purchases, net GHG emissions prior to the retirement of any further offsets are estimated at 828.18 t CO_2-e.

A total of 829 tonnes of carbon offsets would need to be retired to cancel RRBC's GHG emissions for FY2024.

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Appendix A

Scope 3 – Category 1 Purchased goods and services

Table A1 Purchased goods & services emission factors, gross GHG emissions and references – FY24: Q1 & Q2 (Brewery)

Supplier	Weight (kg)	Cost ($)	EF (kg CO_2-e/kg)	EF (kg CO_2-e/$)	GHG emission (t CO_2-e)	Reference
Tolga Farms Malt	303,580		82		24.97	2022 Barley Tolga Farms CO_2e Emissions Calculation Report
Air Liquide	23,119		228		5.27	Kerry, 2007/NGA, 2023
Bintani - Malt	18,475		528		9.75	Boortmalt Sustainability Report 2023
Bintani - Hops	290		7,510		2.18	HPA, 2020
Bintani - Yeast	420		3,204		1.35	COFALEC, 2015
Bintani -Process Aids		$18,640		0.57 - 0.96	11.76	EPiC, 2019
Bintani - Extracts	2,085		1,952 - 2,526		4.69	CONCITO, 2024
Bintani - Flavours	6,447		1,928		12.43	CONCITO, 2024
Fieldtech Solutions (BioGone)		$6,110		0.16	0.98	Hybrid Project Drawdown/EPiC
Boxtec	458		700		0.32	DESNZ, 2023
CC Plastics	23		2,322		0.05	DESNZ, 2023
Clayton Hops	6		7,510		0.04	HPA, 2020
Cospac	2,024		1,403 - 5,255		4.89	DESNZ, 2023
Cryer Malt	460		7,510		3.45	HPA, 2020
East Coast Canning	168		9,109		1.53	DESNZ, 2023
Ellerslie	264		3,204 - 7,510		2.38	COFALEC, 2015/HPA, 2020
Environex	350		1,670		0.58	City of Winnipeg, 2012
Freestyle Hops	60		7,510		0.45	HPA, 2020
Guardian First Aid		$270		0.16 - 0.19	0.05	EPiC, 2019
Karridale Hops	80		7,510		0.60	HPA, 2020

Supplier	Weight (kg)	Cost ($)	EF (kg CO_2-e/kg)	EF (kg CO_2-e/$)	GHG emission (t CO_2-e)	Reference
Gabriel Chocolate	35		16,642		0.58	CONCITO, 2024
Klippakan	3,282		802		2.63	DESNZ, 2023
MCC labels (Multicolour)	368		910		0.34	DESNZ, 2023
Magnum Flavourings	1,660		3,019		5.01	CONCITO, 2024
Mallokup Malt	7,325		528		3.87	Boortmalt, 2023
Orora Cans	8,429		3,264		27.51	DESNZ, 2023
Redox	6,200		2,199		13.64	CONCITO, 2024
Refresh Juice	345		1,006		0.35	CONCITO, 2024
Spice Digital Imaging	13		4,367		0.06	DESNZ, 2023
SWAT	75		410		0.03	Nica, 2010
Swings & Roundabouts	225		1,050		0.24	AWRI, 2023
Unigrain	1,500	Waste product (excluded)			0.00	
Vinpac	6,115		730		4.47	DESNZ, 2023
Visy		$2,051		0.49	1.00	EPiC, 2019
Winequip	75		3,204		0.24	COFALEC, 2015
Total gross GHG emissions					**148.37**	
Total net GHG emissions					**118.13**	Excluding Tolga Farms emissions

Table A2 Purchased goods & services emission factors, GHG emissions and references – FY24: Q3 & Q4 (Brewery)

Supplier	Weight (kg)	Cost ($)	EF (kg CO_2-e/kg)	EF (kg CO_2-e/$)	GHG emission (t CO_2-e)	Emissions factor references
Bintani - Malt	17,399		528		9.18	Boortmalt Sustainability Report 2023
Bintani - Hops	755		7,510		5.67	HPA, 2020
Bintani - Yeast	82		3,204		0.26	COFALEC, 2015
Bintani -Process Aids		$23,254		0.57 - 0.96	15.21	EPiC, 2019
Bintani - Extracts	1,115		528 - 2,526		1.91	CONCITO, 2024 / Boortmalt, 2023
Bintani - Flavours	3,898		1,928		7.51	CONCITO, 2024
Fieldtech Solutions (BioGone)	242		828		0.20	Project Drawdown, 2025
Boxtec	81		700		0.06	DESNZ, 2023
Bluestone Yeast Co.	0.5		3,204		0.002	EPiC, 2019
CC Plastics	13		2,322		0.03	DESNZ, 2023
Clayton Hops	29		7,510		0.22	HPA, 2020
Cospac	4,730		1,403 - 7,400		9.25	DESNZ, 2023
Cryer Malt	106		7,510		0.80	HPA, 2020
East Coast Canning	2,702		9,109		24.61	DESNZ, 2023
Ellerslie	204	$1,200	3,204 - 7,510	0.57	1.11	COFALEC, 2015/HPA, 2020/EPiC, 2019
Environex	1,425		1,140 - 3,184		3.81	City of Winnipeg, 2012
Freestyle Hops	127		7,510		0.95	HPA, 2020
Guardian First Aid		$680		0.16 - 0.39	0.25	EPiC, 2019
Gabriel Chocolate	100		16,642		1.66	CONCITO, 2024
Gateway Printing		$1,819		0.34	0.62	EPiC, 2019
Hip Pocket		$1,864		0.19 - 0.41	0.69	EPiC, 2019
HPA	7,147		7,510		53.67	HPA, 2020
MCC labels (Multicolour)	424		910		0.39	DESNZ, 2023
Magnum Flavourings	1,600		3,019		4.83	CONCITO, 2024

Supplier	Weight (kg)	Cost ($)	EF (kg CO_2-e/kg)	EF (kg CO_2-e/$)	GHG emission (t CO_2-e)	Emissions factor references
Mallokup Malt	12,705		528		6.71	Boortmalt, 2023
Margaret River Roasting Co	80		6,548		0.52	CONCITO, 2024
Mogwai	6		3,204		0.02	COFALEC, 2015
Natural Vanilla		$1,920		0.43	0.83	EPiC, 2019
Nuke Em Pest Control		$500		0.18	0.09	EPiC, 2019
Orora Cans	8,334		3,264		27.20	DESNZ, 2023
Redox	5,000		2,199		11.00	CONCITO, 2024
Ryefield Hops	50		0		0.00	HPA, 2020
Southwest Hops	99		7,510		0.74	HPA, 2020
Spice Digital Imaging	4		4,367		0.02	DESNZ, 2023
SWAT	50		410		0.02	Nica, 2010
Vinpac	4,182		730		3.05	DESNZ, 2023
Wide Open Agriculture	1,000		1,831		1.83	CONCITO, 2024
Winequip	4		3,204		0.01	COFALEC, 2015
Total gross/net GHG emissions					**194.94**	

Table A3 Purchased goods & services emission factors, GHG emissions and references – FY24: Q1 & Q2 (TapHouse)

Supplier	Weight (kg)	Cost ($)	EF (kg CO_2-e/kg)	EF (kg CO_2-e/$)	GHG emission (t CO_2-e)	Emissions factor references
Air Liquide	2,779		228		0.63	Kerry, 2007/NGA, 2023
Cannabis Botanical Distillery	450		1,006		0.45	CONCITO, 2024
Cape Cellars		$5,558		0.36	2.01	EPiC, 2019
CCA	334		506		0.17	CONCITO, 2024
Down South Wholesale		$6,797		0.37 - 0.80	3.74	EPiC, 2019
Guardian First Aid		$80		0.16 0.19	0.01	EPiC, 2019
Haonest Carpet		US$9,904		0.40	3.95	US EPA, 2023
Host		$546		0.48	0.26	EPiC, 2019
Juice Print		$7,708		0.34	2.61	EPiC, 2019
Liquid Mix	1,734		156 - 3,296		1.42	CONCITO, 2024
LS Merchants	1,206		1,050		1.27	AWRI, 2023
Magnum Flavourings	1,800		1,653		2.98	CONCITO, 2024
Office National		$1,764		0.49	0.86	EPiC, 2019
Officeworks	38	$2,806	3,190	0.38 - 0.80	1.32	Paper Aust, 2022/EPiC, 2019
Refresh Juice	266		1,928		0.51	CONCITO, 2024
Southwest Provisions	160	$8	2,412 - 4,030	0.50	0.57	COFALEC, 2015/EPiC, 2019
Swings & Roundabouts	2,808		1,050		2.95	AWRI, 2023
The Fabric Printer		$28,952		0.32	9.35	EPiC, 2019
Water use	270 kL		347		0.09	BOM, 2023
Total gross GHG emissions					**35.16**	
Total net GHG emissions					**35.04**	Excludes carbon neutral office paper

Table A4 Purchased goods & services emission factors, GHG emissions and references – FY24: Q3 & Q4 (TapHouse)

Supplier	Weight (kg)	Cost ($)	EF (kg CO_2-e/kg)	EF (kg CO_2-e/$)	GHG emission (t CO_2-e)	Emissions factor references
Air Liquide	1,773		228		0.40	Kerry, 2007/NGA, 2023
BOC	26		228		0.01	Kerry, 2007/NGA, 2023
Cape Cellars		$1,553		0.36	0.56	EPiC, 2019
Guardian First Aid		$314		0.16 - 0.65	0.14	EPiC, 2019
Juice Print		$8,117		0.34	2.75	EPiC, 2019
Liquid Mix	2,611		156 - 3,296		1.74	CONCITO, 2024
LS Merchants	585		1,050		0.61	AWRI, 2023
Nuke Em Pest Control		$400		0.18	0.07	EPiC, 2019
Office National		$1,084		0.39 - 0.80	0.78	EPiC, 2019
Officeworks	13	$721	3,190	0.19 - 0.49	0.25	Paper Aust, 2022/EPiC, 2019
Refresh Juice	83		1,928		0.16	CONCITO, 2024
Southwest Provisions	54	$4	2,412 - 4,030	0.50	0.19	COFALEC, 2015/EPiC, 2019
Swings & Roundabouts	486		1,050		0.51	AWRI, 2023
The Fabric Printer		$62,457		0.32	20.16	EPiC, 2019
Water use	205 kL		347		0.07	BOM, 2023
Yallingup Cider	288		1,928		0.56	CONCITO, 2024
Total gross/net GHG emissions					**28.98**	

Appendix B

Scope 3 – Category 4 Upstream freight

Table B1 Upstream freight allowances, emission factors, GHG emissions and references – FY24: Q1 & Q2 (Brewery)

Provider / Product	tonne.km	km	Cost ($)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	EF (kg CO_2-e/$)	Emissions (t CO_2-e)	References
Air Liquide	462			0.717			0.33	DESNZ, 2023
Bintani	180,366			0.016 - 0.120			14.23	DESNZ, 2023
Clayton Hops	29			0.120 - 1.234			0.03	DESNZ, 2023
Cryer Malt	6,373			0.016 - 0.120			0.11	DESNZ, 2023
Environex	95			0.717			0.07	DESNZ, 2023
Express Link freight	512			0.120			0.06	DESNZ, 2023
Express Link freight	8,136			0.120			0.98	DESNZ, 2023
Fieldtech Solutions (BioGone)			$748			0.44	0.33	EPiC, 2019
Freestyle Hops	384			0.141 - 1.234			0.23	DESNZ, 2023
Johnston Packaging (Klippikan)	13,622			0.120			1.64	DESNZ, 2023
Konvoy							0.00	DESNZ, 2023
Konvoy							0.00	DESNZ, 2023
Leeuwin Freight	10,411		$29,164	0.120		0.12	3.43	Hybrid/DESNZ, 2023
Leeuwin Freight			$39,264			0.12	4.62	Hybrid/DESNZ, 2023
Mallokup Malt		200			0.287 - 0.604		0.07	DESNZ, 2023
Natural Vanilla	3			0.717			0.002	DESNZ, 2023
Redox	1,472			0.120			0.18	DESNZ, 2023

Provider / Product	tonne.km	km	Cost ($)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	EF (kg CO_2-e/$)	Emissions (t CO_2-e)	References
Natural Vanilla Store	119			0.016 - 0.12			0.01	DESNZ, 2023
Sands Freight	1,740			0.637 - 0.759			1.14	DESNZ, 2023
Sands Freight	1,321			0.637 - 0.759			0.94	DESNZ, 2023
Vinpac	26,574			0.016			0.43	DESNZ, 2023
Visy			$400			0.44	0.18	EPiC, 2019
Total gross/net GHG emissions							**29.01**	

Table B2 Upstream freight allowances, emission factors, GHG emissions and references – FY24: Q3 & Q4 (Brewery)

Provider / Product	tonne.km	km	Cost ($)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	EF (kg CO_2-e/$)	Emissions (t CO_2-e)	References
Air Liquide	35			0.717			0.03	DESNZ, 2023
Australia Post		1,556 parcels				677 kg/domestic parcel	1.05	Australia Post
Bintani	12,940			0.016 - 0.120			0.52	DESNZ, 2023
Capel Transport		164			0.637		0.10	DESNZ, 2023
Clayton Hops	166			0.120 - 1.234			0.19	DESNZ, 2023
Cryer Malt	1,114			0.016 - 0.120			0.02	DESNZ, 2023
Environex							0.00	
EES Shipping	12,926			0.120			1.56	DESNZ, 2023
Express Link freight	144			0.120			0.02	DESNZ, 2023
Express Link freight	11,260			0.120			1.36	DESNZ, 2023
Fieldtech Solutions (BioGone)	912			0.120			0.11	DESNZ, 2023
Freestyle Hops	887				0.141 - 1.234		0.50	DESNZ, 2023
HPA	42,382			0.063 - 0.120			3.51	DESNZ, 2023
Johnston Packaging (Klippikan)							0.00	
Konvoy	5,151			0.120			0.62	DESNZ, 2023
Konvoy	10,092			0.120			1.22	DESNZ, 2023
Leeuwin Freight	158		$22,514	0.120		0.12	2.48	Hybrid/DESNZ, 2023
Leeuwin Freight			$31,178			0.12	3.67	Hybrid/DESNZ, 2023
Mallokup Malt		350			0.604		0.21	DESNZ, 2023

Provider / Product	tonne.km	km	Cost ($)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	EF (kg CO_2-e/$)	Emissions (t CO_2-e)	References
Margaret River Roasting Co		33			0.287		0.01	DESNZ, 2023
Mogwai		18			0.141 - 1.234		0.02	DESNZ, 2023
Natural Vanilla							0.00	
Redox	1,150			0.120			0.14	DESNZ, 2023
Ryefield Hops	214			0.120			0.03	DESNZ, 2023
Natural Vanilla Store							0.00	
Sands Freight	574			0.637 - 0.759			0.40	DESNZ, 2023
Sands Freight	7,357			0.637 - 0.759			5.56	DESNZ, 2023
Total gross/net GHG emissions							**23.31**	

Table B3 Upstream freight allowances, emission factors, GHG emissions and references – FY24: Q1 & Q2 (TapHouse)

Provider / Product	tonne.km	km	Cost ($)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	EF (kg CO_2-e/$)	Emissions (t CO_2-e)	References
Air Liquide		240			0.604		0.14	DESNZ, 2023
BOC Gases		140			0.604		0.08	DESNZ, 2023
Cannabis Botanical Distillery	167			0.717			0.12	DESNZ, 2023
Liquid Mix	620			0.717			0.44	DESNZ, 2023
Officeworks		492			0.210 - 0.287		0.11	DESNZ, 2023
Southwest Provisions	2			0.717			0.002	DESNZ, 2023
Swings & Roundabouts	270			0.717			0.19	DESNZ, 2023
Yallingup Cider		280			0.287		0.08	DESNZ, 2023
Total gross/net GHG emissions							**1.18**	

Table B4 Upstream freight allowances, emission factors, GHG emissions and references – FY24: Q1 & Q2 (Brewery)

Provider / Product	tonne.km	km	Cost ($)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	EF (kg CO_2-e/$)	Emissions (t CO_2-e)	References
Air Liquide		40			0.604		0.02	DESNZ, 2023
Liquid Mix	823			0.717			0.59	DESNZ, 2023
Office National		18			0.210		0.004	DESNZ, 2023
Officeworks		10			0.210 - 0.287		0.002	DESNZ, 2023
Sands Freight	755			0.637			0.48	DESNZ, 2023
Southwest Provisions	1			0.717			0.001	DESNZ, 2023
Swings & Roundabouts	47			0.717			0.03	DESNZ, 2023
Total gross/net GHG emissions							**1.14**	

Table B5 Upstream freight emission factors and references used

Freight type	EF (kg CO_2-e/$)	EF (kg CO_2-e/t.km)	EF (kg CO_2-e/km)	References
Postal and Courier Pick-up and Delivery Service	0.44			EPiC, 2019
Hybrid (Leeuwin)	0.12			Hybrid (Avg Leeuwin Q1)/DESNZ, 2023
Car (average, fuel unknown)			0.210	DESNZ, 2023
Van (average up to 3.5 tonnes)		0.717	0.287	DESNZ, 2023
All Rigids (average)		0.221	1.023	DESNZ, 2023
Rigid (>3.5 - 7.5 tonnes)		0.637	0.604	DESNZ, 2023
Rigid (>3.5 - 7.5 tonnes, refrigerated)		0.759	0.719	DESNZ, 2023
Rigid truck (Average, refrigerated)		0.264	1.219	DESNZ, 2023
Articulated truck (average)		0.093		DESNZ, 2023
Articulated truck (refrigerated)		0.119		DESNZ, 2023
Heavy goods vehicle (average)		0.120		DESNZ, 2023
All heavy goods vehicle (refrigerated)		0.141		DESNZ, 2023
Air freight (<400km)		3.334		DESNZ, 2023
Air freight (>3,700km)		1.234		DESNZ, 2023
General cargo shipping		0.016		DESNZ, 2023
RoRo-Ferry		0.063		DESNZ, 2023

Appendix C

Scope 3 – Category 7 Business related emission factors

Table C1 Land travel allowances, emission factors, emissions and references – FY24: Q1 & Q2 (Brewery)

Fuel Combusted	Distance	Fuel used	EC	CO_2 EF	CH_4 EF	N_2O EF	Scope 3 EF	GHG emissions
	(km)	(litres)	(GJ/kL)	(kg CO_2-e/GJ)				(t CO_2-e)
Gasoline (other than for use as fuel in an aircraft) - > 2004 vehicle	3,750	281	34.2	67.4	0.02	0.2	17.2	0.81
Diesel oil - Post 2004 vehicle	500	50	38.6	69.9	0.01	0.5	17.3	0.17
James Milton fuel card - Diesel oil - Post 2004 vehicle	2,160	38.6	69.9	0.01	0.5	17.3	7.31	2,160
Total								**8.30**

Table C2 Land travel allowances, emission factors, emissions and references – FY24: Q3 & Q4 (Brewery)

Fuel Combusted	Distance	Fuel used	EC	CO_2 EF	CH_4 EF	N_2O EF	Scope 3 EF	GHG emissions
	(km)	(litres)	(GJ/kL)	(kg CO_2-e/GJ)				(t CO_2-e)
Gasoline (other than for use as fuel in an aircraft) - > 2004 vehicle	2,650	210	34.2	67.4	0.02	0.2	17.2	0.61
Diesel oil - Post 2004 vehicle	5,490	536	38.6	69.9	0.01	0.5	17.3	1.81
James Milton fuel card – Diesel oil – Post 2004 vehicle		1,135	38.6	69.9	0.01	0.5	17.3	3.84
Total								**4.74**

Table C3 Air travel allowances, emission factors and emissions (before offset purchases) – FY24: Q1 & Q2 (Brewery)

Flight classification	Distance	CO_2 EF	CH_4 EF	N_2O EF	WTT EF	GHG emissions
	(p.km)	(kg CO_2-e/p.km)				(t CO_2-e)
Short haul (economy)	31,297	0.07880	0.00001	0.00067	0.01656	4.08
International (economy)	23,707	0.07880	0.00001	0.00067	0.01656	2.28
						6.36

Table C4 Air travel allowances, emission factors and emissions (before offset purchases) – FY24: Q3 & Q4 (Brewery)

Flight classification	Distance	CO_2 EF	CH_4 EF	N_2O EF	WTT EF	GHG emissions
	(p.km)	(kg CO_2-e/p.km)				(t CO_2-e)
Domestic (all flights)	1,983	0.15942	0.00022	0.00134	0.03350	0.39
Short haul (economy)	51,825	0.07880	0.00001	0.00067	0.01656	6.76
International (economy)	10,673	0.07880	0.00001	0.00067	0.01656	1.03
Total						**8.17**

Table C5 Accommodation allowances, emission factors and emissions (before offset purchases) – FY24: Q1 & Q2 (Brewery)

Hotel location	Number of room nights	CO_2 EF (kg CO_2-e/room night)	Reference EF location	GHG emissions (t CO_2-e)
Ho Chi Minh	6	71.81	Ho Chi Minh	0.43
Gold Coast	9	29.44	Australia average	0.27
Melbourne	6	29.14	Melbourne	0.17
Total				**0.87**

Table C6 Accommodation allowances, emission factors and emissions (before offset purchases) – FY24: Q3 & Q4 (Brewery)

Hotel location	Number of room nights	CO_2 EF (kg CO_2-e/room night)	Reference EF location	GHG emissions (t CO_2-e)
Brisbane	6	27.89	Brisbane	0.17
Melbourne	20	29.14	Melbourne	0.58
Nelson	10	7.95	New Zealand average	0.08
Perth	3	24.28	Perth	0.07
Total				**0.90**

Table C7 Land travel allowances, emission factors, emissions and references – FY24: Q1 & Q2 (TapHouse)

Fuel Combusted	Distance	Fuel used	EC	CO_2 EF	CH_4 EF	N_2O EF	Scope 3 EF	GHG emissions
	(km)	(litres)	(GJ/kL)	(kg CO_2-e/GJ)				(t CO_2-e)
Gasoline (other than for use as fuel in an aircraft) - > 2004 vehicle	100	9	34.2	67.4	0.02	0.2	17.2	**0.02**

Table C8 Land travel allowances, emission factors, emissions and references – FY24: Q3 & Q4 (TapHouse)

Fuel Combusted	Distance	Fuel used	EC	CO_2 EF	CH_4 EF	N_2O EF	Scope 3 EF	GHG emissions
	(km)	(litres)	(GJ/kL)	(kg CO_2-e/GJ)				(t CO_2-e)
Gasoline (other than for use as fuel in an aircraft) - > 2004 vehicle	100	9	34.2	67.4	0.02	0.2	17.2	**0.02**

Appendix D

Scope 3 – Category 7 Employee commuting allowances and emissions

Table D1 Employee commuting allowances and emissions – FY24: Q1 & Q2 (Brewery)

Name	Distance (km)	Fuel used (litres)	Fuel type	kg CO_2-e/km	GHG emission (t CO_2-e)
Brewery					
Ross	4,140	414	Diesel	0.339	1.40
Adam	8,360	585	Petrol	0.203	1.70
Ryan	9,184	1,102	Diesel	0.406	3.73
Mitch D	1,130	120	Petrol	0.307	0.35
Ben	2,408	217	Diesel	0.305	0.73
Mike	1,356	138	Diesel	0.345	0.47
Mitch B	180	20	Petrol	0.319	0.06
Andrus	3,164	221	Diesel	0.237	0.75
Drew	4,250	298	Petrol	0.203	0.86
Beck	2,000	160	Diesel	0.271	0.54
Jenni	5,500	358	Petrol	0.189	1.04
Sarah	3,010	229	Petrol	0.220	0.66
Ethan	1,728	173	Diesel	0.339	0.59
Total	**46,410**				**12.88**

Table D2 Employee commuting allowances and emissions – FY24: Q3 & Q4 (Brewery)

Name	Distance (km)	Fuel used (litres)	Fuel type	kg CO_2-e/km	GHG emission (t CO_2-e)
Brewery					
Ross	2,567	359	Diesel	0.474	1.22
Adam	8,512	724	Petrol	0.247	2.10
Ryan	6,199	868	Diesel	0.474	2.94
Ryan	2,657	133	Petrol	0.145	0.39
Mitch D	1,080	108	Petrol	0.290	0.31
Andrus	3,136	220	Diesel	0.237	0.74
Ollie	2,618	183	Diesel	0.237	0.62
Beck	2,333	187	Diesel	0.271	0.63
Beck	259	40 (Wh)	Electric	0.089	0.02
Steven	1,040	104	Diesel	0.339	0.35
Steven / Hannah	1,184	118	Diesel	0.339	0.40
Hannah	1,440	115	Petrol	0.232	0.33
Jenni	9,576	622	Petrol	0.189	1.81
James	3,400	340	Diesel	0.339	1.15
Sarah	6,480	570	Petrol	0.255	1.65
Total	**52,481**				**14.67**

Table D3 Employee allowances and emissions – FY24: Q1 & Q2 (TapHouse)

Name	Distance (km)	Fuel used (litres)	Fuel type / Mode	kg CO_2-e/km	GHG emission (t CO_2-e)
TapHouse					
TJ Rocco	1,440	120	Petrol	0.241	0.35
Hannah	1,300	40	Petrol	0.090[3]	0.12
Ben	180		walk		
Kieran	640	54	Petrol	0.247	0.16
Kieran	280		walk		
Keeley	240	17	Petrol	0.200	0.05
Lochie	60		walk		0.35
Total	**4,140**				**0.67**

Table D4 Employee allowances and emissions – FY24: Q3 & Q4 (TapHouse)

Name	Distance (km)	Fuel used (litres)	Fuel type / Mode	kg CO_2-e/km	GHG emission (t CO_2-e)
TapHouse					
Keeley	750	52	Petrol	0.200	0.15
Lochie	750		walk		
Dave	600		walk/cycle		
Dave	400		Uber	0.186	0.07
Kieran	320		walk		
Total	**2,820**				**0.22**

[3] Car pool with one other person

Appendix E (Brewery)

GHG emissions inventory for Brewery operations

The GHG emissions associated with brewery operations are estimated at **792.42 t CO_2-e** for the period 1 July 2023 to 30 June 2024.

The main GHG emitting activities were associated with purchased goods and services followed by stationary fuel consumption.

Scope 1 Emissions - brewery

Scope 1 GHG emissions are released directly from the brewery. Scope 1 emissions associated with brewery operations were estimated at **270.56 t CO_2-e.**

Table 13 Scope 1 emissions summary - brewery

Scope 1 activity	Quantity (kL)	CO_2	CH_4	N_2O	Emissions
		(t CO_2-e)	(t CO_2-e)	(t CO_2-e)	(t CO_2-e)
Fuel Consumption (Stationary)		179.29	0.45	0.56	180.30
Diesel	*28.386*	*76.59*	*0.11*	*0.22*	*76.92*
LPG	*66.381*	*102.70*	*0.34*	*0.34*	*103.38*
Fuel Consumption (Transport)		18.27	0.00	0.07	18.35
Gasoline	*5.799*	*13.37*	*0.00*	*0.04*	*13.41*
Diesel	*1.818*	*4.90*	*0.00*	*0.04*	*4.94*
Wastewater (discharged on site)	2,928	71.90			71.90
Total Emissions Scope 1					**270.56**

Fuel consumption (Stationary & transport)

Diesel and LPG used in stationary equipment in the brewery.

Diesel and gasoline used in fleet vehicles associated with the brewery.

Carbon Neutral used 2024 NGA emission factors (Department of Climate Change, Energy, the Environment and Water, August 2023) to estimate the total direct stationary fuel emissions for RRBC at **180.30 t CO_2-e** and total direct transport fuel emissions at **18.35 t CO_2-e**.

Table 14 Stationary equipment and transport fuel emission factors (by volume) - brewery

Fuel type	Energy content factor	Emissions factor			
		CO_2	CH_4	N_2O	Scope 3
	(GJ/kL)	(kg CO_2 e/GJ)			
Stationary equipment					
Liquified petroleum gasoline	25.7	60.2	0.2	0.2	20.2
Diesel oil	38.6	69.9	0.1	0.2	17.3
Transport					
Gasoline	34.2	67.4	0.02	0.2	17.2
Diesel oil	38.6	69.9	0.01	0.5	17.3

Wastewater treatment

Wastewater generated from brewery operations and disposed of on site.

The volume of water disposed onto the farm was provided by RRBC.

Carbon Neutral used the default wastewater COD for beer sourced from the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Department of Industry, 2022) and the methodology from the Australian Greenhouse Office's Factors and Methods workbook (Australian Greenhouse Office, 2008) to estimate total on-site wastewater emissions for RRBC at **71.90 t CO_2-e.**

Table 15 Default wastewater emission factors

Default wastewater commodity type	$COD_{con,i}$
Beer (ANZSIC code 1212)	6.0

(Department of Industry, 2022)

Exclusions

Direct emissions associated with farm emissions have been excluded.

Emissions associated with composting of spent that are reapplied to the farm have also been excluded from emissions calculations.

Emissions calculations exclude CO_2 produced from fermentation during the beer making process.

Scope 2 Emissions - brewery

There were no scope 2 emissions associated with brewery operations which are powered on solar PV and battery systems.

Emissions associated with on-site renewable energy use are zero when determined using the market based method.

Scope 3 Emissions - brewery

The indirect emissions of all Scope 3 categories associated with the brewery were estimated at **521.87 t CO_2-e** for FY24.

The most significant contribution to Scope 3 emissions from the brewery's value chain came from Purchased Goods and Services.

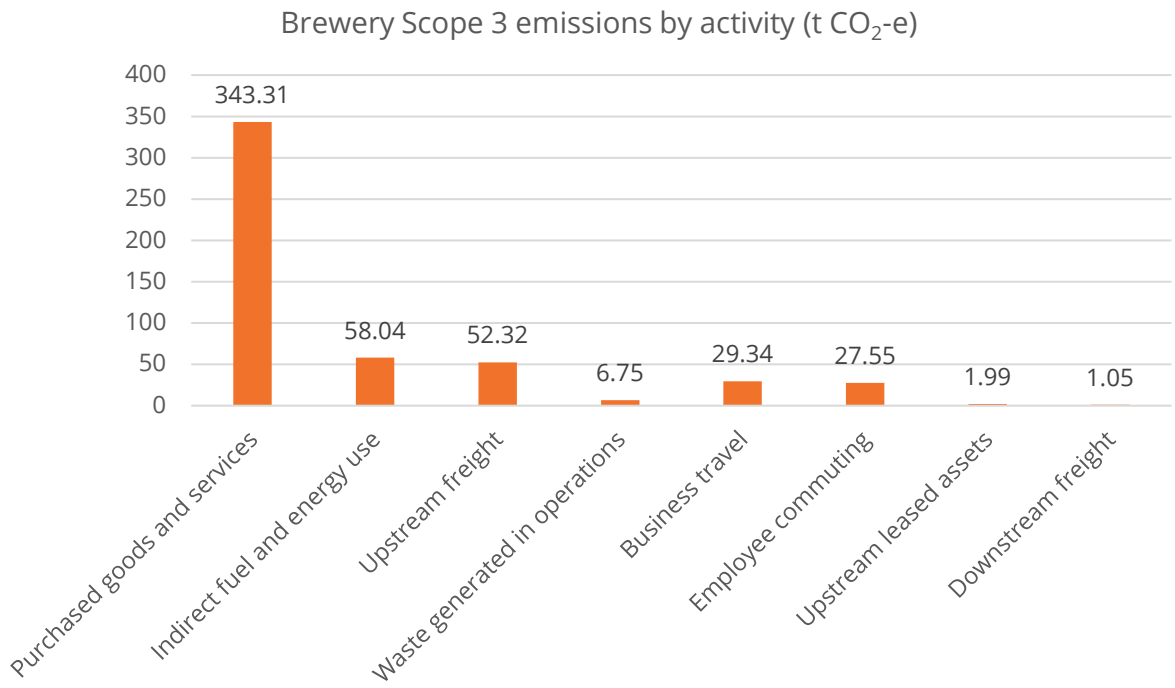

Figure 9 FY24 Scope 3 (gross) emissions by activity for brewery operations (t CO_2-e).

Scope 3 Emissions Summary - brewery

Table 16 FY24 Scope 3 gross GHG emissions by activity for the brewery

Scope 3 GHG emissions category		Emissions (t CO_2-e)
	Upstream emissions	
1	Purchased goods and services	343.31
2	Capital goods	-
3	Indirect fuel and energy use	58.04
4	Upstream freight	53.42
5	Waste generated in operations	6.75
6	Business travel	30.86
7	Employee commuting	27.55
8	Upstream leased assets	1.99
	Downstream emissions	
9	Downstream freight	1.05
10	Processing of sold products	-
11	Use of sold products	-
12	End-of-life treatment of sold products	-
13	Downstream leased assets	-
14	Franchises	-
15	Investments	-
	Total emissions Scope 3	**521.87**

Scope 3 Standard Emissions Categories

Category 1: Purchased goods and services - brewery		
Category description	Upstream (i.e., cradle-to-gate) GHG emissions from the production of products purchased or acquired by RRBC in FY24. This includes both goods (tangible products) and services (intangible products).	
	Gross emissions (t CO_2-e)	**Net emissions (t CO_2-e)**
Purchased goods & services	343.31	313.07

Calculation boundary

This category covers emissions embodied within products and purchased for the brewery.

Materials used for packaging, ingredients (malt, hops, yeasts, extracts, syrups and fruit based flavourings), equipment and chemical purchases, marketing material and consumable purchases were included.

Calculation methodology

A variety of methods were used to determine emissions from Purchased Goods and Services depending on the availability of data.

The 'spend-based' method was used to calculate some emissions, with industry-average emission factors applied, based on the economic value of the goods and services.

The relevant economic sector emission factors from the EPiC database were then applied to calculate the overall emissions estimate for this category (Crawford, 2019).

For bioplastic, a hybrid emission factor has been used with the cost based method for plastic (polymer material) adjusted to be 0.345 times as emissions intensive based on information from Project Drawdown (Project Drawdown, 2025).

Emission factors associated with the use of water and disposal of sewage are obtained from the Australian Bureau of Meteorology Department and the most recent National Performance Report 2022/23: Urban Water Utilities Dataset (BoM, 2023).

Emissions associated with packaging and some ingredients are determined using the mass of input materials where the weight of material by type was provided.

Emission factors are obtained from a variety of sources including industry publications, published life cycle assessment studies, and government sources. See Appendix A for a more detailed breakdown of emissions by type of good or service.

No embodied emissions are associated with the use of oat husks from Unigrain as this material is a waste by product from oat production.

Total emissions of category 1 for brewery operations were calculated at **343.31 t CO_2-e**.

Category 3: Indirect fuel and energy use - brewery	
Category description	Indirect GHG emissions from extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling. It also includes indirect emissions from the transmission and/or distribution of those resources.

Brewery

Fuel	**Usage (kL)**	**Emissions (t CO_2-e)**
Diesel (non-transport)	28.386	18.96
LPG (non-transport)	66.381	34.46
Diesel (transport)	1.818	1.21
Gasoline (transport)	5.533	3.41
Total - Brewery		**58.04**

Calculation boundary

All fuel consumption (operations of stationary machinery and fleet) and grid purchased electricity were included in gross GHG emission calculation.

Calculation methodology

Carbon Neutral used the average-data method to calculate emissions from this category, which involves estimating emissions using secondary (e.g., industry average) emissions factors for upstream emissions per unit of consumption.

Carbon Neutral used 2023 NGA emission factors to estimate indirect fuel and energy emissions for brewery operations at **58.04 t CO_2-e** (Table 2)**.**

Category 4: Upstream freight - brewery	
Category description	GHG emissions from the transportation and distribution of products purchased by the reporting company in the reporting year between the company's suppliers and its operations. It includes third-party transportation and distribution services *purchased* by the reporting company, including inbound logistics, outbound logistics and third-party transportation and distribution between a company's own facilities as well as its cutomers.

Freight type	Gross emissions (t CO_2-e)	Net emissions (t CO_2-e)
Brewery		
Inbound freight	31.37	30.84
Outbound freight	20.95	19.89
Total	**52.32**	**50.73**

Calculation boundary

This category includes emissions from transportation and distribution of products purchased for brewery operations, between their tier 1 suppliers and its operations (in vehicles and facilities not owned or controlled by RRBC).

All incoming and outgoing freight, where the cost of services was paid for by RRBC and not their clients, has been included.

Calculation Methodology

Carbon Neutral used, where possible, the weight and distance-based method (tonne.km) to calculate emissions from this category. This involved determining the weight, distance, and transport method for each freight movement; then applying the appropriate mass-distance emission factor for the vehicle using DESNZ emission factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

For some local deliveries, where the weight of freight was not recorded, whole delivery vehicle emissions were used based on a distance (km) travelled; then applying the appropriate distance-based emission factor for the vehicle using DESNZ emission factors.

Where the weight of freight was not recorded for some Leeuwin freight movements, an emission factor of 0.118 kg CO_2-e / $ was used to estimate emissions, based on freight cost. This emission factor was determined by calculating the average emissions per dollar expenditure of freight movements where both the weight and distance of shipments could be determined during quarter 1 (Jul – Dec 24) of the reporting period.

A more detailed breakdown of freight movements can be found in Appendix B.

Total emissions of this category for brewery operations were calculated at **52.32 t CO_2-e**.

Category 5: Waste generated in operations - brewery	
Category description	GHG emissions associated with waste treatment in facilities owned or operated by third parties.

Facility	Weight (tonnes)	Emissions (t CO_2-e)
Brewery general waste	5.191	6.75

Calculation boundary

This category included all emissions that resulted from waste generated in business operations and sent to landfill in FY24.

Calculation methodology

The weight of waste materials sent to landfill from the brewery was provided for brewery operations.

Emission factors are obtained from the 2023 NGA Factors. The emission factor for co-mingled commercial and industrial waste, 1.3 t CO_2-e/t waste, was used to estimate emissions (Department of Climate Change, Energy, the Environment and Water, August 2023)

Materials separated and sent for recycling or re-use are excluded from the emissions inventory. By recycling cardboard and diverting this away from landfill, 12.64 t CO_2-e of GHG emissions have been avoided by the business.[4]

Total emissions of category 5 for brewery operations were calculated at **6.75 t CO_2-e**.

[4] No allowances have been made for emissions associated with the recycling process

Category 6: Business travel - brewery	
Category description	GHG emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties, such as aircraft, trains, buses, and passenger cars.

Land and air travel

By distance	**Distance (p.km)**	**EF (kg CO_2-e/km)**	**Emissions (t CO_2-e)**
Vehicles	7,890	0.238	1.88
Domestic flight	1,983	0.194	0.39
Short haul economy flight	83,122	0.130	10.84
International economy flight	34,380	0.096	3.30
By fuel use	**Volume (kL)**	**EF (t CO_2-e/kL)**	**Emissions (t CO_2-e)**
Vehicles - diesel	3.295	3.39	11.16
Accommodation	**Room nights**	**EF (t CO_2-e/room)**	**Emissions (t CO_2-e)**
Brisbane	6	27.89	0.17
Ho Chi Minh	6	71.81	0.43
Gold Coast (Australia average used)	9	29.44	0.27
Melbourne	26	29.14	0.76
Nelson (NZ average used)	10	7.95	0.08
Perth	3	24.28	0.07
Total			**29.34**

Calculation boundary

This category included all emissions that resulted from business related travel in FY24 for brewery operations.

This includes road as well as air travel by staff for business related purposes and the use of accommodation during business related trips.

Calculation methodology

Details of work-related travel including vehicles used were obtained by staff survey and an estimate made of fuel consumed for these trips.

Where staff are provided with fuel cards to pay for fuel used for business related purposes, the volume of fuel (diesel) purchased was obtained from supplier spreadsheets.

Emissions from private vehicle use were determined using NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Emissions from flights are determined using DESNZ Factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

For air travel, no allowance has been made for radiative forcing index.

Emissions associated with accommodation are determined using emission factors from the Cornell Hotel Sustainability Benchmarking Index 2023 (Greenview, 2023).

All flights are carbon offset at the time of booking so net emissions associated with flights are taken to be zero.

Emission factors and business-related travel allowances are shown in Appendix C.

Total gross GHG emissions of category 6 for brewery operations were calculated at **29.34 t CO_2-e.**

After allowances for carbon offset flights, net GHG emissions of category 6 for brewery operations are calculated at **14.81 t CO_2-e.**

Category 7: Employee commuting - brewery	
Category description	GHG emissions from the transportation of employees between their homes and their worksites. Emissions from employee commuting may arise from private vehicle travel, bus travel, rail travel and/or air travel.

Brewery

	Distance (km)	Fuel used (litres)	Emissions (t CO_2-e)
Private vehicle – petrol	52,175	3,881	11.26
Private vehicle – diesel	46,457	4,804	16.27
Private vehicle – electric	259	40 (Wh electricity)	0.02
Total	**98,891**		**27.55**

Calculation boundary

Calculation for emissions of employee commuting arise from the commute from home to work and return. This excludes casual staff working for RRBC.

Emissions from staff working from home during FY24 were not considered significant and are not included.

Calculation methodology

Staff surveys were conducted to obtain details of the mode of transport to and from work and details of vehicles used.

Where staff did not know their vehicle's fuel efficiency, these were determined by reviewing the Green Vehicle Guide (Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts, 2025) and using combined fuel consumption data.

Vehicle efficiency and the distance travelled were used to determine fuel consumption for commuting in private vehicles and emissions from private vehicle use determined using NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Uber / taxi emission factors are sourced from the UK conversion factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

Emission factors and commuting allowances are shown in Appendix D.

Total emissions of category 7 from brewery operations were calculated at **27.55 t CO_2-e.**

Category 8: Upstream leased assets - brewery		
Category description	GHG emissions from the operation of assets that are leased by RRBC. This category is applicable only to companies that operate leased assets (i.e., lessees).	
	Electricity used (GJ)	**Emissions (t CO_2-e)**
Head office (shared facility)	12.6	**1.99**

Calculation boundary

This category included facilities used by RRBC for brewery operations that are not deemed to be under the operational control of the business and includes the energy used in its head offices (30m^2) in West Leederville.

Calculation methodology

Metered electricity consumption was not available for RRBC's head office which is shared with other entities.

The 2022 Commercial Building Baseline Study was used to estimate electricity used in this facility. The average electrical energy intensity for offices in WA was used (420 MJ/sqm.a) to estimate electricity use at 12.6GJ for the year (Strategic Policy Research, 2022).

Emissions factors are obtained from the NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023). An emission factor of 158 kg CO_2-e/GJ was used (location-based scope 2 and 3 combined emission factor).

Total emissions of category 8 form brewery operations were calculated at **1.99 t CO_2-e**.

Category 9: Downstream freight - brewery	
Category description	GHG emissions from the transportation and distribution of sold products in vehicles and facilities not owned or operated by the reporting company. It excludes third-party transportation and distribution services purchased by the reporting company and not paid for by customers.

Export shipments	**Details**	**Emissions (t CO_2-e)**
Sea freight	3 x shipments	1.05
	Total	**1.05**

Calculation boundary

This category includes emissions from transportation and distribution of products sold by RRBC (in vehicles not owned or controlled by RRBC).

All outgoing freight where customers paid for the freight was included.

Calculation Methodology

Emissions from sea freight are provided by RRBC based on average data provided by Singapore Ports who provided an estimate of 0.35 t CO_2-e per shipment.

Total emissions of category 9 were calculated at **1.05 t CO_2-e.**

Emissions Intensity - brewery

Emissions intensity expresses GHG impact per unit of physical activity or unit of economic output. These metrics allow for more meaningful comparison of emissions between years, operations and organisations.

The carbon intensity of an organisation's footprint can be calculated by dividing emissions by a relevant measure of activity.

RRBC's main operations consist of beer production. As such, an emissions intensity has been calculated per litre of beer produced for FY2024 brewery operations. This is represented in Table 17. Additionally, Table 18 displays the emissions intensity of RRBC's operations per employee.

Table 17 FY24 Brewery emissions intensity (per litre of beer produced)

Emissions Intensity	Volume of beer produced (kL)	GHG Emissions (t CO_2-e)	GHG Emissions Intensity (kg CO_2-e/L)
FY2024 (Gross)	980	790.90	0.81
FY2024 (Net)	*980*	*745.59*	*0.76*

Table 18 FY24 brewery emissions intensity (FTE).

Emissions Intensity	FTE	GHG Emissions (t CO_2-e)	GHG Emissions Intensity (t CO_2-e/staff)
FY2024 (Gross)	18.2	790.90	43.5
FY2024 (Net)	*18.2*	*745.59*	*41.0*

Appendix F (TapHouse)

GHG emissions inventory for TapHouse operations

The GHG emissions associated with TapHouse operations are estimated at **83.85 t CO_2-e** for the period 1 July 2023 to 30 June 2024.

Scope 1 Emissions - TapHouse

There are no direct emissions of GHG from the TapHouse. Emissions of CO_2 used in RRBC produced beer are excluded from the GHG emissions inventory.

Scope 2 Emissions – TapHouse

Scope 2 emissions are indirect GHG emissions associated with imported electricity use.

Scope 2 emissions are relevant for the TapHouse facility only and 70% of the premises' electricity use has been assigned to TapHouse operations.

The GHG indirect emissions from electricity use for RRBC were estimated at **20.11 t CO_2-e** for FY24 when determined using the locations-based method.

When determined using the market-based method, emissions associated with electricity use equal zero as 100% GreenPower (grid sourced renewable energy) is used in the TapHouse.

Table 19 Scope 2 emissions summary (locations-based method) - TapHouse

GHG emissions – Scope 2	Quantity (kWh)	Emissions (t CO_2-e)
Electricity use	37,945	20.11
Steam, heat or cooling as a service	Not applicable	Not applicable

Scope 3 Emissions - TapHouse

The indirect emissions of all Scope 3 categories associated with the TapHouse were estimated at **83.65 t CO_2-e** for FY24.

The most significant contribution to Scope 3 emissions from the TapHouse's value chain came from Purchased Goods and Services.

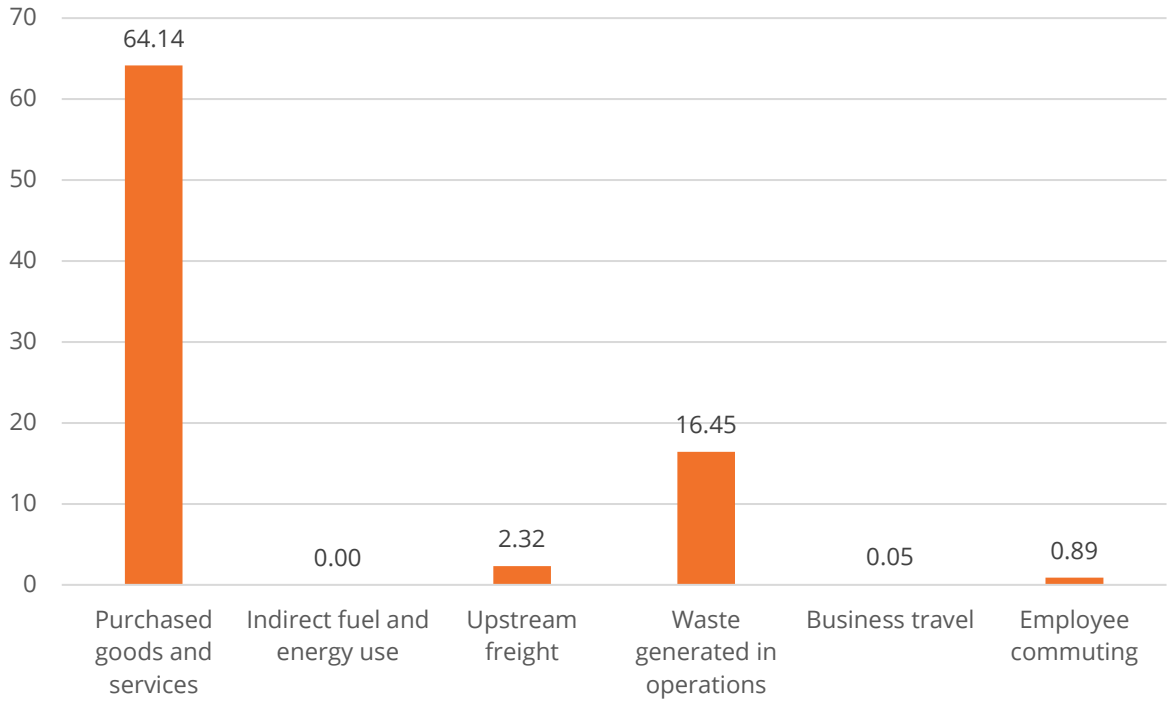

Figure 10 FY24 Scope 3 (gross) emissions by activity for TapHouse operations (t CO_2-e).

Scope 3 Emissions Summary - TapHouse

Table 20 FY24 Scope 3 gross GHG emissions by activity for the TapHouse

	Scope 3 GHG emissions category	Emissions ($t CO_2$-e)
	Upstream emissions	
1	Purchased goods and services	64.14
2	Capital goods	-
3	Indirect fuel and energy use (market based electricity)	0.00
4	Upstream freight	2.32
5	Waste generated in operations	16.45
6	Business travel	0.05
7	Employee commuting	0.89
8	Upstream leased assets	-
	Downstream emissions	
9	Downstream freight	-
10	Processing of sold products	-
11	Use of sold products	-
12	End-of-life treatment of sold products	-
13	Downstream leased assets	-
14	Franchises	-
15	Investments	-
	Total emissions Scope 3	**83.85**

Scope 3 Standard Emissions Categories

Category 1: Purchased goods and services - TapHouse		
Category description	Upstream (i.e., cradle-to-gate) GHG emissions from the production of products purchased or acquired by RRBC in FY24. This includes both goods (tangible products) and services (intangible products).	
	Gross emissions (t CO_2-e)	**Net emissions (t CO_2-e)**
TapHouse	64.14	63.94

Calculation boundary

This category covers emissions embodied within products and purchased for the TapHouse.

Calculation methodology

A variety of methods were used to determine emissions from Purchased Goods and Services depending on the availability of data.

The 'spend-based' method was used to calculate some emissions, with industry-average emission factors applied, based on the economic value of the goods and services.

The relevant economic sector emission factors from the EPiC database were then applied to calculate the overall emissions estimate for this category (Crawford, 2019).

Emission factors associated with the use of water and disposal of sewage are obtained from the Australian Bureau of Meteorology Department's National Performance Report 2022/23: Urban Water Utilities Dataset (BoM, 2023).

Emissions associated with some ingredients are determined using the mass of input materials where the weight of material by type was provided.

Emission factors are obtained from a variety of sources including industry publications, published life cycle assessment studies, and government sources. See Appendix A for a more detailed breakdown of emissions by type of good or service.

Total emissions of category 1 for TapHouse operations were calculated at **64.14 t CO_2-e**.

Category 3: Indirect fuel and energy use - TapHouse	
Category description	Indirect GHG emissions from extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling. It also includes indirect emissions from the transmission and/or distribution of those resources.

Electricity	**Usage (kWh)**	**Emissions (t CO_2-e)**
Electricity - SWIS (market-based)	37,945	0
Electricity – Residual mix (location-based)	37,945	1.52

Calculation boundary

All grid purchased electricity use was included in gross GHG emissions calculations.

When calculated using the locations-based method to determine emissions associated with electricity use, scope 3 emissions for this category are calculated at 1.52 t CO_2-e for TapHouse operations.

As GreenPower is used, net GHG emissions associated with indirect electricity emissions are zero when determined using the market-based approach.

Calculation methodology

Carbon Neutral used the average-data method to calculate emissions from this category, which involves estimating emissions using secondary (e.g., industry average) emissions factors for upstream emissions per unit of consumption.

Carbon Neutral used 2023 NGA emission factors to estimate indirect fuel and energy emissions from the TapHouse at **0.00 t CO_2-e** (Table 2 and Table 5)**.**

Category 4: Upstream freight – TapHouse	
Category description	GHG emissions from the transportation and distribution of products purchased by the reporting company in the reporting year between the company's suppliers and its operations. It includes third-party transportation and distribution services *purchased* by the reporting company, including inbound logistics, outbound logistics and third-party transportation and distribution between a company's own facilities as well as its cutomers.

Freight type	Gross emissions (t CO_2-e)	Net emissions (t CO_2-e)
Inbound freight	2.32	2.32

Calculation boundary

This category includes emissions from transportation and distribution of products purchased for TapHouse operations, between their tier 1 suppliers and its operations (in vehicles and facilities not owned or controlled by RRBC).

All incoming freight, where the cost of services was paid for by RRBC and not their clients, has been included.

Calculation Methodology

Carbon Neutral used, where possible, the weight and distance-based method (tonne.km) to calculate emissions from this category. This involved determining the weight, distance, and transport method for each freight movement; then applying the appropriate mass-distance emission factor for the vehicle using DESNZ emission factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

For some local deliveries, where the weight of freight was not recorded, whole delivery vehicle emissions were used based on a distance (km) travelled; then applying the appropriate distance-based emission factor for the vehicle using DESNZ emission factors.

A more detailed breakdown of freight movements can be found in Appendix B. Total emissions of this category for TapHouse operations were calculated at **2.32 t CO_2-e**.

Category 5: Waste generated in operations - TapHouse	
Category description	GHG emissions associated with waste treatment in facilities owned or operated by third parties.

Facility	Weight (tonnes)	Emissions (t CO_2-e)
TapHouse general waste	6.545	15.99
TapHouse wastewater	427.5	0.45
Total		**16.45**

Calculation boundary

This category included all emissions that resulted from waste generated in business operations and sent to landfill in FY24.

This category also includes emissions associated with wastewater from TapHouse operations sent offsite for disposal.

Calculation methodology

An emission factor for co-mingled commercial and industrial waste, 1.3 t CO_2-e/t waste, was used to estimate emissions (Department of Climate Change, Energy, the Environment and Water, August 2023)

The volume of waste generated for the year was based on three full 240 litre mobile garbage bins being collected weekly. A volume to weight conversion factor of 0.329 t/m^3 was applied based on the default waste stream percentage for waste mix types from the Commonwealth's NGER Determination (Department of Industry, 2022).

Materials separated and sent for recycling or re-use are excluded from the emissions inventory. By recycling cardboard and diverting this away from landfill, 7.92 t CO_2-e of GHG emissions have been avoided by the business[5].

Total emissions of category 5 for TapHouse operations were calculated at **16.45 t CO_2-e**.

[5] No allowances have been made for emissions associated with the recycling process

Category 6: Business travel - TapHouse	
Category description	GHG emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties, such as aircraft, trains, buses, and passenger cars.

Land and air travel	**Distance (p.km)**	**EF (kg CO_2-e/km)**	**Emissions (t CO_2-e)**
Vehicles	200	0.247	**0.05**

Calculation boundary

This category included all emissions that resulted from business related travel in FY24 for TapHouse operations.

This only included road travel for the period.

Calculation methodology

Details of work-related travel including vehicles used were obtained by staff survey and an estimate made of fuel consumed for these trips.

Emissions from private vehicle use were determined using NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Total gross GHG emissions of category 6 for TapHouse operations were calculated at **0.05 t CO_2-e.**

Category 7: Employee commuting - TapHouse			
Category description	GHG emissions from the transportation of employees between their homes and their worksites. Emissions from employee commuting may arise from private vehicle travel, bus travel, rail travel and/or air travel.		
	Distance (km)	**Fuel used (litres)**	**Emissions (t CO_2-e)**
Private vehicle – petrol	4,370	283	0.82
Uber	400		0.07
Walk / cycle	2,190		-
Total	**6,960**		**0.89**

Calculation boundary

Calculation for emissions of TapHouse employee commuting arise from the commute from home to work and return. This excludes staff hired on a casual basis.

Emissions from staff working from home during FY24 were immaterial and are not included.

Calculation methodology

Staff surveys were conducted to obtain details of the mode of transport to and from work and details of vehicles used.

Where staff did not know their vehicle's fuel efficiency, these were determined by reviewing the Green Vehicle Guide (Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts, 2025) and using combined fuel consumption data.

Vehicle efficiency and the distance travelled were used to determine fuel consumption for commuting in private vehicles and emissions from private vehicle use determined using NGA Factors (Department of Climate Change, Energy, the Environment and Water, August 2023).

Uber / taxi emission factors are sourced from the UK conversion factors (UK Government's Department for Energy Security & Net Zero, Department for Environment Food & Rural Affairs, 2023).

Emission factors and commuting allowances are shown in Appendix D.

Total emissions of category 7 for TapHouse operations were calculated at **0.89 t CO_2-e.**