

## Scope 3 Greenhouse Gas emissions calculation methodology

### Scope 3 Categories & Boundaries

The emissions boundary defines which activities and emissions sources within Treasury Wine Estates' (TWE) value chain are included within the greenhouse gas inventory. The below table presents the 15 categories, their relevance to TWE's Scope 3 footprint, inclusions and exclusions. The majority of our expanded Scope 3 data is based on amounts spent in our supply chain, which results in a lag in reporting since it takes time to source, extract, and verify this data. For this reason, we are reporting emissions based on F21 data.

Scope 3 category	Evaluation status	Metric tons CO <sub>2</sub> -e	Inclusions	Exclusions	Explanation
<b>Upstream</b>					
01 - Purchased goods and services	Relevant, calculated	<b>475,921</b>	<ol style="list-style-type: none"> <li>1. Purchased raw materials (grapes, bulk wine, additives)</li> <li>2. Purchased packaging (glass bottle, corks, capsule, cardboard, pallets, packaging materials)</li> <li>4. Vineyard: Viticulture (contracted processing, management, harvesting, etc) and purchased fertiliser, herbicide and fungicide</li> <li>5. Plant and equipment: Repair/maintenance</li> <li>6. Professional services: Accounting and audit, legal, sales and marketing, business services, travel management, engineering services, entertainment, conference function and catering, cleaning services, and security services</li> <li>7. IT and communication: Purchased software, repair and maintenance services</li> <li>8. Office operation: Purchase of office consumables, printing, stationary and consumables, and couriers and postage</li> <li>9. Warehousing</li> <li>10. Water consumption</li> </ol> <p>[Where spend-based emission factors are used to estimate the emissions for purchased goods under Category 1, these typically include transportation (i.e. cradle-to-gate emission factors).]</p>	<ol style="list-style-type: none"> <li>1. Office consumable expenditure via corporate credit cards and petty cash.</li> <li>2. Freight (ocean, road and air freight) expenditure excluded from category 1 as emissions from logistics for all mode of transports are captured under Category 4.</li> </ol>	Office consumable expenditure is expected to be immaterial and that the majority of expenditure is captured centrally

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02 - Capital goods	Relevant, calculated	<b>38,267</b>	<ol style="list-style-type: none"> <li>1. Purchased oak barrels</li> <li>2. Purchased IT hardware</li> <li>3. Purchased communication equipment</li> <li>4. Purchased equipment and machinery for vineyard, winery, plant and warehouses (construction and upgrading projects)</li> </ol> <p>[Where spend-based emission factors are used to estimate the emissions for purchased capital goods under Category 2, these typically include transportation (i.e. cradle-to-gate emission factors).]</p>	Embodied emissions in buildings owned or leased	Expected to be immaterial and TWE can have limited opportunities to influence these emissions. Potential methods of influence would be to operate their offices in green-certified buildings
03 - Fuel and energy related activities	Relevant, calculated	<b>6,568</b>	<ol style="list-style-type: none"> <li>1. Extraction, production, and transportation of: <ol style="list-style-type: none"> <li>a. Diesel</li> <li>b. ULP</li> <li>c. LPG</li> <li>d. Natural gas</li> </ol> </li> <li>2. Electricity: <ol style="list-style-type: none"> <li>a. extraction, production and transport of fuel burnt at generation</li> <li>b. transmission and distribution losses.</li> </ol> </li> </ol>	N/A	No exclusion of emission sources.
04 - Upstream transportation and distribution	Relevant, calculated	<b>270,304</b>	<p>The following logistic services are expected to be paid for by TWE and are therefore reported under Category 4:</p> <ol style="list-style-type: none"> <li>1. Transportation of grapes from vineyards to wineries</li> <li>2. Transportation of wine from wineries to bottling sites/ports</li> <li>3. Transportation of bottled wine from bottling sites to ports/customers</li> <li>4. Transportation of wine from port to port</li> <li>5. Transportation of wine from port to bottling sites/customers</li> <li>6. Transportation of glass from suppliers to bottling site"</li> </ol>	Where spend-based emission factors are used to estimate the emissions for purchased goods and capital goods under Category 1 & 2, these typically include transportation (i.e. cradle-to-gate emission factors).	Any emissions for purchased goods and capital goods are considered in Categories 1 and 2.

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05 - Waste generated in operations	Relevant, calculated	<b>2,656</b>	<ol style="list-style-type: none"> <li>1. Waste from operations sent to landfill</li> <li>2. Waste from operations sent to recycling</li> <li>3. Organic waste sent to reuse</li> <li>4. Wastewater from operations sent to sewage"</li> </ol>	Transportation of waste to landfill and recycling facilities	Waste generated in operations inclusions (i.e. general waste, process waste, organic waste, non-organic waste, recycling/reusable waste) represent less than 0.4% of the total TWE Scope 3 inventory. As such, emissions for transportation of waste are expected to be immaterial.
06 - Business travel	Relevant, calculated	<b>594</b>	<ol style="list-style-type: none"> <li>1. Domestic and international flights</li> <li>2. Hotels stays</li> <li>3. Hired cars</li> <li>4. Train</li> <li>5. Employees using their own cars for business travel purpose</li> </ol>	Taxi and ride share	Business travel inclusions (i.e. air travel, accommodation and car hire) represent less than 0.1% of the total TWE Scope 3 inventory. As such, emissions for taxi/rideshare use are expected to be immaterial
07 - Employee commuting	Relevant, calculated	<b>2,594</b>	<ol style="list-style-type: none"> <li>1. Employee commuting</li> <li>2. Employee working from home</li> </ol>	Ride share/carpool	Employee commuting inclusions (i.e. public transportation, passenger car, light-duty truck and working from home) represent less than 0.4% of the total TWE Scope 3 inventory. As such, emissions for rideshare/carpool use are expected to be immaterial
08 - Upstream leased assets	Not relevant, explanation provided	<b>N/A</b>	N/A	N/A	Leased assets in US (viticulture holdings) are incorporated into the relevant Scope 1 and 2 calculation

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Scope 3 category	Evaluation status	Metric tons CO <sub>2</sub> -e	Inclusions	Exclusions	Explanation
<b>Downstream</b>					
09 - Downstream transportation and distribution	Relevant, calculated	<b>14,647</b>	<ol style="list-style-type: none"> <li>1. Electricity consumption for refrigeration of sold products (home refrigeration could technically be included in Category 11 (Use of sold products) but it was included in Category 9 for simplicity.</li> <li>2. Transportation of products from customer distribution centre to retail stores.</li> <li>3. Transportation of products from retail stores to end customers.</li> <li>4. Transportation of end-consumer waste (packaging materials purchased by TWE (i.e. glass, paper, cardboard, plastics and aluminium), to nearest recycling facility [The Lindeman's brand logistics data TWE provided are assumed to all be associated with services paid for by TWE and are therefore captured under Category 4.]</li> </ol>	Refrigerants leakage from cooling of sold products at hospitality venues, supermarkets, customer homes, etc	Emissions from refrigerant leakage is expected to be immaterial. The majority of the emissions from use of sold products are from electricity consumption for refrigeration.
10 - Processing of sold products	Not relevant, explanation provided	<b>N/A</b>	N/A	N/A	No intermediate products by TWE in this reporting period.
11 - Use of sold products	Not relevant, explanation provided	<b>N/A</b>	N/A	N/A	TWE has no influence over end-use of the packaged products
12 - End of life treatment of sold products	Relevant, calculated	<b>-</b>	<ol style="list-style-type: none"> <li>1. End of life treatment of packaging materials; i.e. glass, paper, cardboard, plastics and aluminium.</li> <li>2. In accordance with the GHG Protocol Corporate Value Chain (Scope 3) Standard (Category 5 - Box [5.6] (page 46)), to avoid double counting of emissions from recycling processes by the same company, companies should account for upstream emissions from recycling processes in Category 1 and Category 2 when the company purchases goods or materials with recycled content.</li> </ol>	N/A	

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13 - Downstream leased assets	Relevant, calculated	<b>990</b>	Scope 1 & 2 emissions for TWE's tenant at BV Winery in the United States (e.g. calculated using BV Winery's total fuel and electricity consumption).	N/A	No exclusion of emission sources.
14 - Franchises	Not relevant, explanation provided	<b>N/A</b>	N/A	N/A	An emissions figure is not calculated for this category as TWE does not have franchised operations.
15 - Investment	Not relevant, explanation provided	<b>N/A</b>	N/A	N/A	TWE is not engaged in any joint venture partnerships where it does not have operational control. Emissions associated with the North Para Environment Control and Graymoor Estate are incorporated into the relevant Scope 1, 2 and 3 calculations.

### Scope 3 Emissions Calculation Methodology

Scope 3 category	Evaluation status	Metric tons CO2-e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Emission Factor Source
<b>Upstream</b>					
01 - Purchased goods and services	Relevant, calculated	<b>475,921</b>	<p>Spend based method: F21 spend in AUD dollars was sourced from TWE finance and accounting system for capital goods.</p> <p>Relevant Emission Factor Source as listed are used to convert spend into emission estimates.</p>	3.4%	<p>The University of Sydney (2017) CO2-e Emission Factors, Factors Workbook</p> <p>IELab Australian Base Table, 344 sector aggregation, calculated for the reference year 2014-15. As calculated within the IELab's Embodied Carbon Explorer tool</p> <p>For water supply conversion factors:</p> <ul style="list-style-type: none"> <li>Table 72, Ministry for the Environment New Zealand: Measuring Emissions: A Guide for Organisations: 2022 Detailed Guide.</li> <li>'Water Supply' tab of the UK Government Greenhouse Gas Reporting Conversion Factors 2020</li> <li>AusLCI, v1.35</li> </ul>
02 - Capital goods	Relevant, calculated	<b>38,267</b>	Spend based method: F21 spend in AUD dollars was sourced from TWE finance and accounting system for capital goods.	0%	<p>The University of Sydney (2017) CO2-e Emission Factors, Factors Workbook</p> <p>IELab Australian Base Table, 344 sector aggregation, calculated for the reference</p>

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Scope 3 category	Evaluation status	Metric tons CO2-e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Emission Factor Source
			Relevant Emission Factor Source as listed are used to convert spend into emission estimates.		year 2014-15. As calculated within the IELab's Embodied Carbon Explorer tool
03 - Fuel and energy related activities	Relevant, calculated	<b>6,568</b>	Emissions attributable to the extraction, production and transport of fuels and electricity transmission and distribution losses were estimated through applying the relevant Scope 3 emission factors from the NGA Factors Oct 2020 to F21 consumption data for Petrol, diesel, LPG, natural gas and electricity.	0%	Table 41-44, Scope 2 and 3 emission factors - consumption of purchased electricity by end users, National Greenhouse Account Factors, October 2020 Note: Australia emission factors applied for China, France, Italy, New Zealand and United States as these regions do not have emission factor available
04 - Upstream transportation and distribution	Relevant, calculated	<b>270,304</b>	Upstream and downstream transportation and distribution were calculated based on the percentage of total volume of wine sold by the Lindeman brand, linearly extrapolated to cover TWE's total volume of wine sold for their global operations.	0%	'Freighting goods' tab of the UK Government Greenhouse Gas Reporting Conversion Factors 2020
05 - Waste generated in operations	Relevant, calculated	<b>2,656</b>	Emissions from disposal and treatment of F21 TWE waste generated were calculated based on various Emission Factor Sources (as listed).	0%	Table 47, Waste emission factors for total waste disposed to landfill by broad waste stream category, municipal solid waste, National Greenhouse Account Factors, October 2020  Section 4.2, National Greenhouse Account Factors, October 2021

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					<p>IELab</p> <ul style="list-style-type: none"> <li>• IO table of reference: 2015-16</li> <li>• GHG data of reference: 2015-16</li> </ul> <p>Greenhouse Gas Protocol Product Life Cycle Accounting and Reporting Standard, Chapter 9</p> <p>Table 73, Ministry for the Environment New Zealand: Measuring Emissions: A Guide for Organisations: 2022 Detailed Guide.</p> <p>'Water treatment' tab of the UK Government Greenhouse Gas Reporting Conversion Factors 2020</p>
06 - Business travel	Relevant, calculated	<b>594</b>	<p>Emissions from domestic and international flight undertaken by employees for business travel were estimated based on F21 travel data provided by TWE's third-party corporate service provider.</p> <p>For hotels and accommodation, emissions were estimated using UK Government Greenhouse Gas Reporting Conversion Factors 2021 based on number of nights stayed.</p>	100%	<p>SimaPro 9: air passenger travel, domestic/AU U (IPCC 2013 GWP 100a V1.03)</p> <p>Emissions from flights undertaken by employees for business travel are sourced directly from BHP's third-party corporate travel service provider's FY2021 emissions report.</p> <p>Table 38, Ministry for the Environment New Zealand: Measuring Emissions: A</p>



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Scope 3 category	Evaluation status	Metric tons CO2-e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Emission Factor Source
					<p>Guide for Organisations: 2022 Detailed Guide.</p> <p>Table 10 Scope 3 Category 6: Business Travel and Category 7: Employee Commuting, US EPA 2021 GHG Emission Factors Hub, April 2021</p> <p>'Hotel stay' tab of the UK Government Greenhouse Gas Reporting Conversion Factors 2021</p> <p>"Business travel-land" tab of the UK Government Greenhouse Gas Reporting Conversion Factors 2020</p>
07 - Employee commuting	Relevant, calculated	<b>2,594</b>	<p>Emission sources included are emissions associated with staff commute to and from the TWE sites as well as working from home. It was assumed that employees work 5 days per week and 48 weeks per year</p> <p>Staff commute to and from TWE sites has been estimated using data collected from Employee Commuting Survey, fuel types by transport mode, and fuel consumption/km by each transport mode.</p> <p>Estimated activity data has been multiplied by</p>	16% (427 responses collected from Employee Commuting Survey – total employees of 2621)	<p>Table 10 Scope 3 Category 6: Business Travel and Category 7: Employee Commuting, US EPA 2021 GHG Emission Factors Hub, April 2021</p> <p>Table 19 &amp; 26, The Ministry for the Environment New Zealand: Measuring Emissions: A guide for Organisations 2020 Detailed Guide, December 2020</p> <p>"Business travel-land" tab of the UK Government Greenhouse Gas Reporting Conversion Factors 2020</p>

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			emission factors from various emission factor sources as listed.		<p>Table 44, Scope 2 and 3 emission factors - consumption of purchased electricity by end users, National Greenhouse Account Factors, October 2020</p> <p>Table 2, emission factors for the consumption of gaseous fuels, National Greenhouse Account Factors, October 2020</p> <p>Table 41, Scope 3 emission factors - natural gas for product that is not ethane (inclusive of coal seam gas), National Greenhouse Account Factors, October 2020</p>
08 - Upstream leased assets	Not relevant, explanation provided	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	
<b>Downstream</b>					
09 - Downstream transportation and distribution	Relevant, calculated	<b>14,647</b>	Upstream and downstream transportation and distribution can be calculated by using average distance travelled by diesel heavy goods vehicle and estimated amount of electricity consumption from wine refrigeration by consumers and retailers.	0%	<p>Table 6 Electricity, US EPA 2021 GHG Emission Factors Hub, April 2021</p> <p>Table 44, Scope 2 and 3 emission factors - consumption of purchased electricity by end users, National Greenhouse Account Factors, October 2020</p>

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					'UK electricity' and 'Freight goods' tabs of the UK Government Greenhouse Gas Reporting Conversion Factors 2020
10 – Processing of sold products	Not relevant, explanation provided	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	
11 – Use of sold products	Not relevant, explanation provided	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	
12 – End of life treatment of sold products	Relevant, calculated	-	To avoid double counting of emissions from recycling processes by the same company, TWE has accounted for upstream emissions from recycling processes in Category 1 and Category 2. Emissions factor for end-of-life packaging materials has been removed from the calculations.  Assumptions: Assumed that 100% of the glass bottles, paper/cardboard, plastics and aluminium purchased by TWE are recycled by end consumers.	0%	GHG Protocol Corporate Value Chain (Scope 3) Standard
13 – Downstream leased assets	Relevant, calculated	<b>990</b>	Emissions from F21 TWE United States tenants' annual electricity and natural gas consumption were calculated by multiplying	0%	Table 6 Electricity, US EPA 2021 GHG Emission Factors Hub, April 2021

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			emission factors from USEPA 2021 GHG emission Factors Hub.		Table 1 Stationary Combustion, US EPA 2021 GHG Emission Factors Hub, April 2021
14 - Franchises	Not relevant, explanation provided	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	
15 - Investment	Not relevant, explanation provided	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	