
BREWING CO

Illustrative Carbon & Capital Sensitivity Review

Mid-Market Brewery | \$35m Revenue Model

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1. Executive Summary

This illustrative review demonstrates how carbon exposure can be analysed as a financial sensitivity variable within a mid-market brewery operating at approximately \$35 million in annual revenue.

This is not a statutory inventory. It is not an assurance-grade emissions statement. It is not a regulatory liability estimate.

It is a spend-based carbon screening model designed for capital-oriented sensitivity analysis.

Using a structured spend-based methodology aligned to recognised greenhouse gas accounting frameworks, this review:

- Estimates total value-chain emissions using general ledger-aligned expenditure categories
- Identifies structural concentration within procurement categories
- Tests EBITDA sensitivity under shadow carbon pricing
- Highlights strategic cost-structure variables

For breweries operating at 10% EBITDA margins, embedded carbon exposure interacts directly with procurement, packaging mix, and capital decisions.

This review complements but does not replace a full activity-based GHG inventory. Under full engagement, material categories transition from spend-based proxies to activity or supplier-specific emission factors, where available.

2. Financial Profile — Illustrative Brewery

Assumed Operating Profile

Metric	Assumption
Revenue	\$35,000,000
Volume	22,000,000 litres
EBITDA Margin	10%
EBITDA	\$3,500,000

Packaging Mix Assumption

Format	Share
Aluminium cans	65%
Glass bottles	25%
Draught	10%

This mix reflects a typical off-premises-dominant mid-market operator.

3. Brewing Cost Context (FY2022–FY2024)

Between FY2022 and FY2024, brewing margins were shaped more by input cost volatility than by volume growth. Aluminium prices peaked in 2022 and then corrected in 2023, materially affecting the cost structures of canned products. Energy costs remained structurally significant across the sector, prompting many brewers to pursue longer-term procurement arrangements to stabilise operating expenses.

Across global peers, gross margins compressed through 2022–2023, then partially recovered in 2024, driven primarily by pricing discipline, a shift in premium mix, and cost productivity rather than commodity deflation.

In this operating environment, packaging mix, energy procurement strategy, and SKU architecture function as primary margin variables.

4. Industry Research & Decarbonisation Direction

Public disclosures from ANZ and global brewers over FY2022–FY2024 indicate a structural shift in how carbon and cost volatility are managed. These initiatives are generally framed as capital-allocation and risk-management decisions rather than compliance responses.

Theme	Illustrative Industry Initiatives
Thermal & Electricity Transition	Long-term renewable PPAs; biomass conversion or electrification of boilers; selective on-site solar investment
Packaging & Circularity	Increased recycled content in aluminium and glass; lightweighting programs; returnable bottle systems
Agricultural Sourcing	Supplier engagement on barley and hops; early-stage regenerative pilots; increased traceability in export markets
Internal Carbon Pricing	Shadow pricing (\$60–\$100/t) applied within capex screening and transition risk modelling

For mid-market operators, procurement discipline and packaging optimisation typically deliver more immediate financial impact than operational energy upgrades alone.

Absolute decarbonisation in packaging- and agriculture-intensive sectors depends materially on supply-chain transformation. This review focuses on financial exposure and controllable levers within current operating parameters.

5. Modelled Emissions Profile — Spend-Based Screening Estimate

Using structured spend-based benchmarks aligned to the assumed cost profile:

Total Estimated Emissions: ~21,400 tCO₂e

Scope Distribution (Screening-Level Estimate)

Scope	Tonnes	% of Total
Scope 1 (screening estimate via expenditure categories)	2,300	11%
Scope 2 (screening estimate via expenditure categories)	2,000	9%
Scope 3 (spend-based EEIO)	17,100	80%
Total	21,400	100%

All scopes are estimated using a consistent spend-based methodology for comparability within this screening model.

The profile is structurally consistent with brewing sector norms: upstream procurement dominates exposure.

6. Scope 3 Concentration — Primary Drivers

Indicative concentration within Scope 3:

Category	% of Total Emissions
Aluminium cans	15–18%
Malted barley	12–15%
Glass bottles	7–9%
Hops	6–8%
Freight (inbound & outbound)	5–8%
Cardboard & secondary packaging	4–6%

With a 65% can-heavy mix, aluminium represents the single largest controllable emissions category.

Emissions are not proportional to spending; material intensity drives concentration.

7. Carbon Intensity Metrics (Screening-Level)

Metric	Value
Emissions per litre	~0.97 kg CO ₂ e
Emissions per hectolitre	~97 kg CO ₂ e
Emissions per \$ revenue	~0.61 kg CO ₂ e

These figures include full Scope 3 using spend-based estimation and are not directly comparable to assured, activity-based operational disclosures by large global brewers.

8. Shadow Carbon Price Sensitivity (EBITDA Lens)

Applying commonly observed internal carbon pricing assumptions:

Carbon Price (\$/t)	Implied Cost (\$m)	% of EBITDA
\$35	\$0.75	21%
\$60	\$1.28	37%
\$80	\$1.71	49%
\$100	\$2.14	61%

Assumptions

- Full internalisation
- No cost pass-through
- No mitigation response
- Spend-based emissions estimate

This does not imply regulatory liability. It illustrates the sensitivity of margins under carbon-constrained supply-chain conditions, using screening-level emissions estimates.

9. Structural Observations

1. Electricity decarbonisation alone does not materially alter total value-chain exposure within a screening model.
2. Packaging format mix is the most immediate controllable variable.
3. Aluminium procurement strategy influences embedded carbon intensity.
4. Volume growth without packaging optimisation proportionally increases exposure.
5. Supplier-specific and activity-based data materially refine prioritisation beyond the screening level.

These structural characteristics suggest that packaging procurement, supplier engagement, and capital screening discipline are likely to deliver greater financial impact than incremental reporting effort alone.

Carbon behaves as a procurement-linked cost variable rather than an isolated compliance metric.

10. Methodological Basis

This illustrative model applies a spend-based emissions estimation methodology consistent with:

- ISO 14064-1 (Greenhouse Gas Accounting and Reporting)
- GHG Protocol Corporate Accounting and Reporting Standard
- GHG Protocol Scope 3 Category Framework (1–15)

Under a spend-based approach, emissions are estimated by applying environmentally extended input–output (EEIO) emission factors to financial expenditure categories derived from general ledger data.

Spend-based EEIO models are widely used for Scope 3 screening, where supplier-level primary data is not yet available.

This method is appropriate for:

- Early-stage carbon screening
- Financial exposure analysis
- Procurement concentration assessment
- Capital sensitivity modelling

Under full engagement, material categories transition to activity-based measurement (e.g., fuel volumes, kWh consumption, packaging mass) and, where available, supplier-specific emission factors.

Additional Scope 3 categories, such as employee commuting, capital goods, business travel, leased assets, and waste streams, are incorporated where material.

Refinement toward decision-grade carbon accounting involves hybrid modelling and the progressive replacement of spend-based proxies with measured or supplier-derived data.

11. Emission Factor Framework (Spend-Based EEIO)

Emission factors are applied using an environmentally extended input–output (EEIO) framework.

Indicative factor sources include:

Category	Method	Typical Source Type
Purchased Goods & Packaging	Spend-based (EEIO)	Multi-regional input–output databases (e.g., EXIOBASE)
Agricultural Inputs	Spend-based (EEIO)	Global agricultural sector intensity datasets
Freight & Logistics	Spend-based (sector average)	National accounts and logistics intensity benchmarks
Energy & Utilities	Spend-based sector factors	National greenhouse accounts
Waste	Spend-based sector factors	National waste intensity datasets

Emission factors are selected using a hierarchy prioritising:

6. National greenhouse accounts (AU/NZ where applicable)
7. Multi-regional EEIO databases
8. Peer-reviewed sector intensity benchmarks

This illustrative model applies a consistent spend-based method across all scopes to maintain comparability within the screening framework.

12. Data Refinement Pathway

To move from illustrative screening to decision-grade carbon analysis:

- General ledger-level category mapping
- Activity-based measurement of fuel and electricity consumption
- Packaging material mass validation
- Supplier-specific emission factors for high-impact categories
- Hybrid modelling of material Scope 3 categories
- Inclusion of additional relevant Scope 3 categories

Precision improves clarity in capital allocation and strategic prioritisation.

Closing Perspective

For mid-market breweries operating at Illustrative 10% EBITDA margins, cost-structure volatility has shown how sensitive earnings can be to packaging, energy, and input inflation.

Carbon exposure is embedded within those same procurement categories.

Understanding its financial interaction even at the screening level supports disciplined procurement and capital decision-making before committing resources to full inventory development.

This screening approach is intentionally proportionate for mid-market businesses, relying primarily on existing financial data before progressing to more detailed measurement where justified.