

Sample Report

Scope 3 Screening Report

Table of Contents

- Executive Summary 3
- Overview of Tools 5
- Methodology and Results..... 6
 - Quantis Scope 3 Evaluator 6
 - Quantis Scope 3 Evaluator Results 7
 - 2020 vs. 2022 Comparison 10
 - Climate Neutral Brand Emissions Estimator (BEE) 11
 - Climate Neutral BEE Results 12
 - Climatiq 14
- Discussion 15
- Recommendations 16
- Appendix A 17
- Appendix B 18

Executive Summary

Background

As a certified B Corporation, ABC Company is committed to making the world a better place by meeting the highest standards of social and environmental performance, transparency, and accountability. ABC Company has been a leader in its industry for over 60 years and continues to push the limits of what it means to use business as a force for good. In 2022, ABC Company pledged to take on two aggressive goals for climate action: net zero greenhouse gas emissions by 2050 and zero waste to landfill by 2030.

Foresight Management worked with ABC Company to conduct a screening of its Scope 3 emissions in 2020. For 2022, Foresight has repeated the methodology from the previous screening for comparison purposes. To better understand how to manage and reduce its Scope 3 emissions, Foresight presents two additional methodologies for calculating Scope 3 emissions.

Purpose

Scope 3 emissions are the indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company. To track and reduce the impact of its carbon footprint, ABC Company publicly discloses its Scope 1 and 2 greenhouse gas (GHG) emissions on an annual basis. Although Scope 3 emissions quantification is not required, the majority of total corporate emissions come from Scope 3 sources, so it is important that companies account for and report on these emissions. ABC Company committed to the Science-Based Targets Initiative (SBTi) in 2022. In preparation for the SBTi efforts, ABC Company is setting a Scope 3 target and will need to be able to quantify and show reductions in line with this target.

The purpose of this report is to identify hotspots and provide visibility into the risks and opportunities associated with ABC Company's value chain, including both upstream and downstream emissions. With this information, ABC Company will have more insight into Scope 3 data collection and calculation methods with the goal of being able to reduce these emissions in line with their SBTi reduction goal.

Key Takeaways

- Approximately 87% of ABC Company's total GHG emissions come from Scope 3 emissions in 2022 (86% in 2020).

- Purchased goods and services are the largest contributor to ABC Company's carbon footprint, accounting for about 80% of ABC Company's total emissions and 70% of its Scope 3 emissions.
 - One category of purchased goods account for about 63% of ABC Company's Scope 3 emissions and 55% of ABC Company's total emissions in 2020.
- ABC Company should focus on reducing emissions related to purchased goods and services and create an action plan for achieving a Scope 3 emissions science-based reduction target to maximize its emissions reduction efforts.

Overview of Tools

Foresight Management used Quantis' Scope 3 Evaluator (quantis-suite.com) to estimate ABC Company's Scope 3 emissions for all 15 categories and compare the previous 2020 assessment to 2022 spend data. For many of the Scope 3 categories, GHG emissions are estimated in terms of expenditures in a given economic industry or sector. Such calculations leverage environmental input-output datasets based on the World Input-Output Database (WIOD)¹ and the Open IO Database.

Another tool to consider was created by Climate Neutral. Climate Neutral (climateneutral.org) is a nonprofit organization with a mission to eliminate carbon emissions by making climate neutrality a priority for businesses and consumers. They primarily do this through their certification program called Climate Neutral Certified which ensures that companies are working to reduce their greenhouse gas emissions from making and delivering its products and services and compensates for all these emissions every year by purchasing high-quality and verified carbon credits. In support of this goal, Climate Neutral created a carbon measurement tool called the Brand Emissions Estimator (BEE) which is available to any business at a low cost to make tracking carbon emissions more accessible and effective. For this report, we used the BEE to estimate 8 categories of ABC Company's Scope 3 emissions to show how the tool can be used for planning, tracking, and achieving carbon reductions.

One additional option for more robust Scope 3 calculations is using the database and tools from Climatiq. Climatiq (climatiq.io) is a data company that specializes in building climate intelligent solutions. They host an open dataset of global emission data that can be used to inform meaningful reductions in climate footprints, and they constantly update their dataset in line with the latest improvements and updates in climate data. Foresight is collaborating with Climatiq to improve the accuracy and efficiency of emissions calculations and reporting for the companies we serve. Climatiq is also creating new tools to improve Scope 3 calculations. We offer Climatiq's database and tools as an option for future calculations in this report.

¹ Marcel P. Timmer (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", WIOD Working Paper Number 10, downloadable at <http://www.wiod.org/publications/papers/wiod10.pdf>. Data accessed at http://www.wiod.org/new_site/database/seas.htm

Methodology and Results

QUANTIS SCOPE 3 EVALUATOR

Emissions Factors and Databases

The WIOD database spans 27 European countries and 13 other major countries in the world for a period from 1995 to 2009. The economic matrix, intervention matrix, and Global Warming Potential (GWP) factors were combined to get the WIOD emissions factors (EF) in units of kg CO₂e/US Dollar (USD) shown in [Appendix A](#). An inflation adjustment was used to account for economic spend over the years. The ecoinvent database (v2) covering mainly European countries was also used.

Inputs

ABC Company Senior Cost Analyst contributed spend data for 2022's Scope 3 Screening. Specific data provided is available in [Appendix B](#).

Example Calculation

A general formula for calculating Scope 3 emissions using the spend-based method is:

$$\text{Activity Spend Data (USD)} \times \text{EF (kg CO}_2\text{e/USD)} = \text{GHG Emissions (kg CO}_2\text{e)}$$

Limitations of the Quantis Tool

- Increased spending and increased production will always result in higher emissions with this methodology, even if actual emissions do not correlate to these increases.
- The Quantis tool is intended to provide rough estimates. For larger emissions sources, data quality should be improved upon.
- Anywhere WIOD is used, only three GHGs are accounted for (CO₂, CH₄, N₂O).
- Anywhere WRI emissions factors are used, only CO₂ is accounted for (none of the other GHG sources are included).
- The majority of emission factors within the Quantis Tool model are from 2014. Some new modules and emission factor data were added in 2017, but another update is not expected until 2022 or beyond.
- Scope 3 Category 11 (Use of Sold Products) only covers energy use by sold products, not products that contain or form GHGs in use.
- The input-output database upon which much of the modeling relies is based on a global emissions model, so it offers only a rough approximation of any given region or country.
- The last time the tool updated the associated price conversion data was in 2016.

Quantis Scope 3 Evaluator Results

Table 1. 2022 Total Absolute Emissions Breakdown

Scope	Emissions (kg CO ₂ e /year)	Percent (%) of Total Emissions
Scope 1 (calculated by Foresight)	11,394,000	7.49%
Scope 2 (calculated by Foresight)	7,873,000	5.18%
Scope 3	132,834,508	87.33%

Table 2. 2022 Scope 3 Emissions Breakdown

Category	Emissions (kg CO ₂ e)	Percent (%) of Total Scope 3 Emissions	Percent (%) of Total (Scope 1,2,3) Emissions
1 – Purchased goods and services	106,845,841	80.44%	70.52%
2 – Capital goods	5,902,061	4.44%	3.88%
3 – Fuel and energy-related activities	4,423,100	3.33%	2.91%
4 – Upstream transportation and distribution	6,764,575	5.09%	4.45%
5 – Waste generated in operations	2,209,962	1.66%	1.45%
6 – Business travel	1,496,718	1.13%	0.98%
7 – Employee commuting	1,020,000	0.77%	0.67%
8 – Upstream leased assets	0.00	0.00%	0.00%
9 – Downstream transportation and distribution	1,236,228	0.93%	0.81%
10 – Processing of sold products	0.00	0.00%	0.00%
11 – Use of sold products ²	0.00	0.00%	0.00%
12 – EoL of sold products	2,046,000	1.54%	1.35%
13 – Downstream leased assets	0.00	0.00%	0.00%
14 – Franchises	0.00	0.00%	0.00%
15 – Investments	890,023	0.67%	0.59%

² Due to a lack of available data, the use of sold products was excluded from the calculations in this report.

Figure 1. ABC Company’s 2022 Total Emissions Breakdown (% of total)

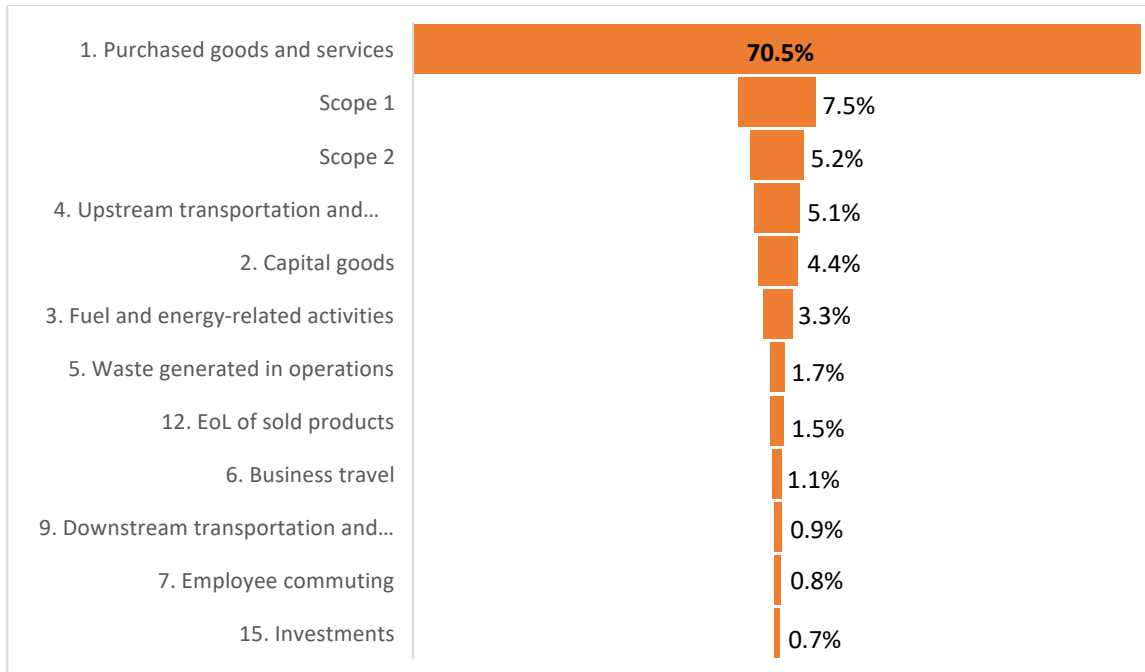


Figure 2. ABC Company’s 2022 Scope 3 Emissions Breakdown

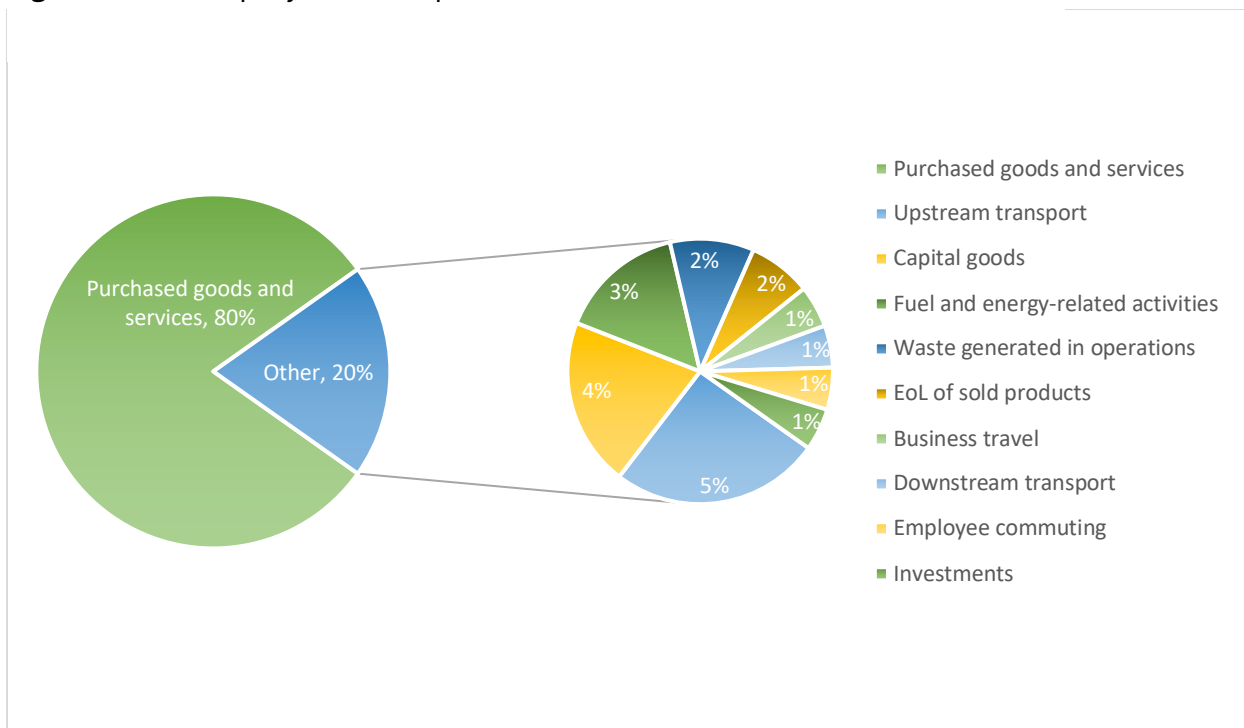


Figure 3. ABC Company’s 2022 Emissions from Purchased Goods and Services

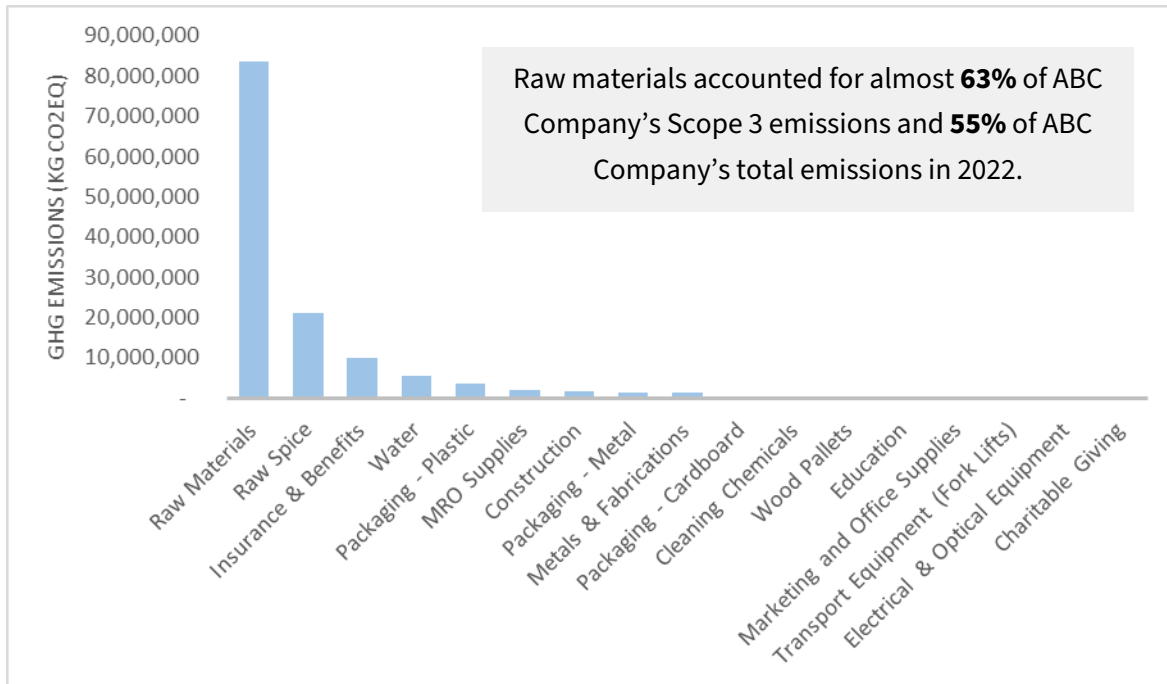
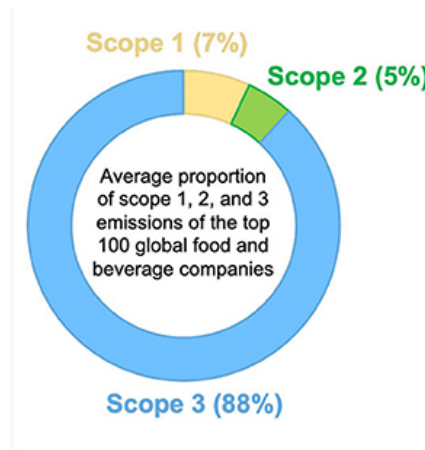


Figure 4. What do the emissions of other food and beverage companies look like?



Food and Engineering (2020): Distribution of top 100 global food and beverage companies for average proportion of scope 1, 2 and 3 emissions, when emission disclosure data were available. Data show the number of goals active in 2020 reports, data from 2019.³

³ Food Engineering (2020). 2020 Top 100 Food and Beverage Companies | Food Engineering. Available online at: <https://www.foodengineeringmag.com/2020-top-100-food-beverage-companies>.

2020 vs. 2022 Comparison

Table 3. 2020 and 2022 Total Absolute Emissions Breakdown and Comparison

Scope	2020 Emissions (kg CO ₂ e /year)	2022 Emissions (kg CO ₂ e /year)
Scope 1	7,515,000	11,394,000
Scope 2	8,436,000	7,873,000
Scope 3	98,401,332	132,834,508

Table 4. 2020 and 2022 Scope 3 Emissions Breakdown and Comparison (Detailed spend data for 2020 and 2022 is available in *Appendix B*)

Category	2020 Emissions (kg CO ₂ e)	2022 Emissions (kg CO ₂ e)	Comments
1 – Purchased goods and services	78,646,502	106,845,841	Spending increased by 26%
2 – Capital goods	5,972,402	5,902,061	Spending decreased by 1%
3 – Fuel and energy-related activities	3,565,950	4,423,100	Increased scope 1 and 2 emissions
4 – Upstream transportation and distribution	1,271,380	6,764,575	Spend data separated into upstream and downstream in 2022
5 – Waste generated in operations	1,421,578	2,209,962	Spending increased by 57%
6 – Business travel	2,070,893	1,496,718	Spending decreased by 14%
7 – Employee commuting	1,020,000	1,020,000	Same estimates based on range of employees from 251-1,000
8 – Upstream leased assets	0.00	0.00	Not Material to ABC Company
9 – Downstream transportation and distribution	2,043,885	1,236,228	Spend data separated into upstream and downstream in 2022
10 – Processing of sold products	0.00	0.00	Not Material to ABC Company
11 – Use of sold products	Data Not Available	Data Not Available	
12 – EoL of sold products	1,498,718	2,046,000	Increase in products produced by 11%

13 – Downstream leased assets	0.00	0.00	Not Material to ABC Company
14 – Franchises	0.00	0.00	Not Material to ABC Company
15 – Investments	890,023	890,023	Same estimate used for joint venture

CLIMATE NEUTRAL BRAND EMISSIONS ESTIMATOR (BEE)

Emission Factors and Databases

The BEE utilizes the EXIOBASE database of monetary emission factors for estimating emissions. EXIOBASE is a global, detailed Multi-regional Environmentally Extended Supply and Use/Input Output (MR EE SUT/IOT) database. It is one of the most extensive EE-MRIO systems available worldwide. The database covers 163 industries, 200 products and 49 countries and world regions from 1995-2019. EXIOBASE is much more applicable and comprehensive than the WIOD database used in the Quantis Scope 3 Evaluator.

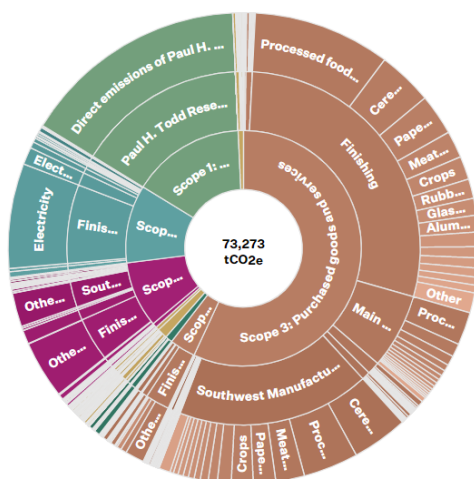
Inputs

For estimation, the BEE requires the following data:

- Total operating costs for year of estimation.
- List of facilities including location and broken out by offices, factories, warehouses and retail stores.
 - o For factories, include:
 - Whether the facility is controlled or un-controlled by estimating company.
 - % Of total production at each facility.
 - Type of products or services created and % of total products or services.
 - o For offices, include:
 - % Of employees at each office.

For ABC Company’s Scope 3 Screening for 2022, Foresight used available facility information from the Dashboard and additional production and employee data provided by ABC Company Senior Cost Analyst.

Figure 1. Climate Neutral Results Chart



Interactive results chart available through the BEE’s online portal.

Limitations of the Tool

- The Estimation phase of the BEE is intended only for rough estimates.
- Emission factors are not visible to the user within the tool (but can be found through open-source databases that include EXIOBASE).
- The BEE only estimates and calculates eight Scope 3 categories: purchased goods and services, capital goods, fuel and energy-related activities, upstream transportation and distribution, waste generated in operations, business travel, employee commuting, and downstream transportation and distribution. This is a limitation, but it covers the categories that ABC Company has identified as material and wants to better measure, track, and reduce.

Climate Neutral BEE Results

Table 5. 2022 Scope 3 Emissions Breakdown from the BEE

Category	Emissions (kg CO ₂ e /year)	Percent (%) of Total Scope 3 Emissions
Total Estimated Scope 3	54,040,310⁴	-
1 – Purchased goods and services	41,706,350	77.18%
2 – Capital goods	2,607,190	4.82%

⁴ Emissions estimations vary from the Quantis Scope 3 Evaluator due to the different emission factor database. For example, WIOD has one category for Food, Beverages, and Tobacco with an emission factor of 1.13 kg CO₂e/USD. A 2022 emission factor for Seasonings and Dressings in the U.S. has an emission factor of 0.4 kg CO₂e/USD.

3 – Fuel and energy-related activities	714,540	1.32%
4 – Upstream transportation and distribution	1,021,220	1.89%
5 – Waste generated in operations	354,710	0.66%
6 – Business travel	451,430	0.84%
7 – Employee commuting	6,651,760	12.31%
8 – Upstream leased assets	Not Available in BEE	-
9 – Downstream transportation and distribution	533,110	0.99%
10 – Processing of sold products	Not Available in BEE	-
11 – Use of sold products	Not Available in BEE	-
12 – EoL of sold products	Not Available in BEE	-
13 – Downstream leased assets	Not Available in BEE	-
14 – Franchises	Not Available in BEE	-
15 – Investments	Not Available in BEE	-

Refinement Opportunities

The BEE includes the ability to manipulate estimated data or “refine” emissions by entering actual spend data and physical data to make more accurate calculations. The refinement part of the tool uses a Google Sheet workbook that syncs with their online platform to provide instant updates to calculations and visual representations of the data. Refinement calculations use the ecoinvent (v3.9) database of emission factors.

Table 6. The physical data required for each Scope 3 category for refinement in the BEE.

Category	Data Required
Purchased goods and services (3 options)	<ul style="list-style-type: none"> Itemized purchase orders that include the facility the materials are purchased for Source region Purchased material Quantity purchased Itemized bills of materials (BOMs) for each product produced Facility where each product was produced Source region Purchased material Quantity purchased per product Total energy use at contract manufacturers where purchased goods and services are manufactured

	<ul style="list-style-type: none"> • Location • Total amount of fuels and electricity purchased at each site
Upstream transportation and distribution	<ul style="list-style-type: none"> • Weight • Distance • Shipping mode of all shipments from suppliers to measuring company
Waste generated in operations	<ul style="list-style-type: none"> • Facility where waste generated • Location • Waste type • Amount spent on waste removal
Business travel	<ul style="list-style-type: none"> • Flight information (from, to, layover airports, and number of trips) • How much spent on and locations of hotels • Distance of land travel for business purposes
Employee commuting	<ul style="list-style-type: none"> • Number of employees at each facility • Average distance • Methods of commuting to work • % of methods for commuting
Downstream transportation and distribution	<ul style="list-style-type: none"> • Weight • Distance • Shipping mode of all shipments to customers

CLIMATIQ

Climatiq houses an updated and comprehensive emission factor database and is in the process of creating useful tools for supporting solutions for challenges in sustainability metrics and reporting. Foresight partners with Climatiq, and they may be creating a tool that would help with quantifying and tracking ABC Company’s Scope 3 emissions. At the time of this report, results and examples of the results are not ready to share. Foresight will follow-up with this information when it is available.

Emission Factors and Databases

Climatiq uses the EXIOBASE database for monetary spending data, and they provide reputable emission factors from over 24 global agencies and data providers for over 47,000 data points. They also rate available emission factors for data quality.

Input

Any combination of monetary or physical data can be used for all 15 categories based on available data.

Limitations of the Tool

- This tool is under production, so we do not know exactly what the interface, data submission process and results will look like.

Discussion

The global food system contributes up to 37% of total annual emissions. Scope 3 emissions are typically around 88% of total emissions produced by food and beverage companies⁵. Even though Scope 3 emissions are the greatest source of a company's overall emissions, there are significant barriers to implementing and achieving emissions reductions. For example, there is no standardized framework or tool for comprehensively collecting and calculating scope 3 emissions⁶. CDP scope 3 disclosure includes qualitative comments and descriptive written reports which have been found to be "highly non-uniform and subjective".⁷ Also, engaging suppliers is challenging and does not always translate into lower emissions.

In this report, we considered three pathways for measuring Scope 3 emissions. The Quantis Scope 3 evaluator provides a high-level estimate that allows companies to see where their emissions hotspots are located within their supply chain. The emission factors and databases are outdated, and the input data based on monetary spending does not allow companies to track reductions unless they correlate to fewer purchases. Climate Neutral's BEE allows for both a high-level estimate and calculations based on physical data which is more actionable. It does not cover all scope 3 categories, but it covers the categories that are most material to ABC Company. ClimaTiq can provide more individualized data support based on the most relevant databases available. They are creating tools to help with calculations and reductions.

Better data enables companies to make more informed decisions and achieve climate goals. One example of a company in the food and beverage industry that is making progress toward their science-based target is DEF Company. An overview of their emissions and science-based target can be found in Tables 7 and 8.

Table 7. DEF Company's SBTi Scope 3 target information

⁵Food Engineering (2020). 2020 Top 100 Food and Beverage Companies | Food Engineering. Available online at: <https://www.foodengineeringmag.com/2020-top-100-food-beverage-companies> (accessed February 12, 2021).

⁶Mo Li, Thomas Wiedmann, Michalis Hadjikakou. Enabling full supply chain corporate responsibility: scope 3 emissions targets for ambitious climate change mitigation. *Environ. Sci. Technol.*, 54 (1) (2020), pp. 400-411, 10.1021/acs.est.9b05245.

⁷ Santosh K. Mahapatra, Schoenherr Tobias, Jayanth Jayaram. "An assessment of factors contributing to firms' carbon footprint reduction efforts." *Int. J. Prod. Econ.*, 235 (May) (2021), p. 108073, 10.1016/j.ijpe.2021.108073

DEF Company's Scope 3 target	Near term target	Target timeframe	Progress update in 2021
Reduce absolute scope 3 GHG emissions from purchased goods and services by 42%	1.5°C by 2030	2017 to 2030	6.9% decrease

Table 8. DEF Company's 2021 Total emissions breakdown

Scope	2021 Emissions (kg CO₂e)	% of total emissions
Scope 1	37,889,000	1.17%
Scope 2	58,726,000	1.82%
Scope 3	3,131,649,000	97.01%
Total Scope 3 emissions within target (only purchased goods and services)	2,354,356,000	75% of total Scope 3

DEF Company is pursuing their Scope 3 emissions reduction target by creating a partnership with suppliers and industry peers through their Supplier Leadership on Climate Transition (S-LoCT) program. In partnership with Mars and PepsiCo, S-LoCT provides suppliers resources, tools and knowledge to support climate action. The program includes an educational seminar series, supplier maturity scoring and a monthly check-in to drive conversations among brands. DEF Company also invests in energy-efficient facilities and renewable energy for supply chain partners.

Recommendations

Foresight Management recommends three main actions to continue assessing and reducing ABC Company's Scope 3 emissions:

1) Create and implement a data collection strategy

ABC Company should pursue an iterative approach to improve the accuracy of its Scope 3 emissions inventory by collecting more granular and accurate data, using primary and physical data where available.

Some opportunities for data improvement include:

- Choose a calculation methodology that works best for ABC Company.

- Map out where physical data could be located within your company for future collection efforts. Foresight can assist with collection and organizing of Scope 3 data, if desired.
- Break out raw materials in purchased goods and services by specific material groups and by which country or region the material is sourced from.

2) Investigate Purchased Goods and Services.

Given the magnitude of this source category, Foresight recommends pursuing a more accurate approach to quantify these emissions. The Climate Neutral BEE tool or ClimaTiq climate data would both be ways to support improved quantification of this category. Also, life cycle assessments (LCAs) could be a useful tool for understanding the impacts of specific products. Foresight can assist with data collection, analysis, and LCAs, if desired.

3) Create a reduction plan for achieving Scope 3 Science-Based Target.

The most robust approach to reducing Scope 3 impact involves setting quantitative emissions reductions targets. Foresight recommends creating action plans that are SMART (specific, measurable, achievable, relevant and time-bound). Selecting specific materials or processes to target for reductions will assist ABC Company with achieving its target.

Some strategies to consider include:

- Supplier and industry engagement
 - For example, consider assisting with technology investments to decarbonize manufacturing or agricultural processes with supply chain partners and industry groups (i.e., carbon insetting).
- Implement stricter procurement policies and standards.
- Consider business model innovations.

Appendix A

Global Warming Potential (GWP) Factors by IPCC 2007 AR4

GHG	GWP	Units
CO ₂	1	kg CO ₂ e
CH ₄	25	kg CO ₂ e
N ₂ O	298	kg CO ₂ e

CO 1.57 kg CO₂e

World Input-Output Database (WIOD) Emissions Factors for Quantis Scope 3 Evaluator.

Spend Category	Country	WIOD Emission Factor (kg CO ₂ e/USD)
Air Transport	Global	1.97
Basic Metals and Fabricated Metal	Global	1.57
Chemicals and Chemical Products	Global	1.34
Coke, Refined Petroleum and Nuclear Fuel	Global	1.59
Construction	Global	0.81
Education	Global	0.31
Electrical and Optical Equipment	Global	0.82
Electricity, Gas and Water Supply	Global	5.13
Food, Beverages, and Tobacco	Global	1.13
Health and Social Work	Global	0.3
Hotels and Restaurants	Global	0.56
Inland Transport	Global	0.96
Machinery (not elsewhere classified)	Global	0.83
Other Community, Social and Personal Services	Global	0.75
Pulp, Paper, Paper, Printing and Publishing	Global	0.71
Rubber and Plastics	Global	1.27
Transport Equipment	Global	0.62
Water Transport	Global	2.06
Wood and Products of Wood and Cork	Global	1.07
Other	Global	0.75

Appendix B

Spend Data collected and percent change between 2020 and 2022.

Category	ABC Company boundaries	Total Spend 2020	Total Spend 2022	Change	% Change
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