Kashi's Carbon Footprint Methodology

Wow, thanks for tuning in to learn more about how we measure our impact on climate change, we're happy to break it down for you!

First, some climate science jargon, if you've made it this far you've probably seen our Climate Change 101 page explaining basic terms that you will see below, but you should also know:

When we talk about "Emissions" that includes all types of greenhouse gasses.
Emissions are grouped into three "scopes":

- Scope 1: are direct emissions from buildings and machinery that are controlled or owned by Kashi like offices and manufacturing sites.
- Scope 2: are indirect emissions from the electricity, steam, heating, or cooling bought by Kashi.
- Scope 3: are al other indirect emissions (not included in scope 2) from our entire "value chain" which is everything we do to grow, cook, and sell our foods.

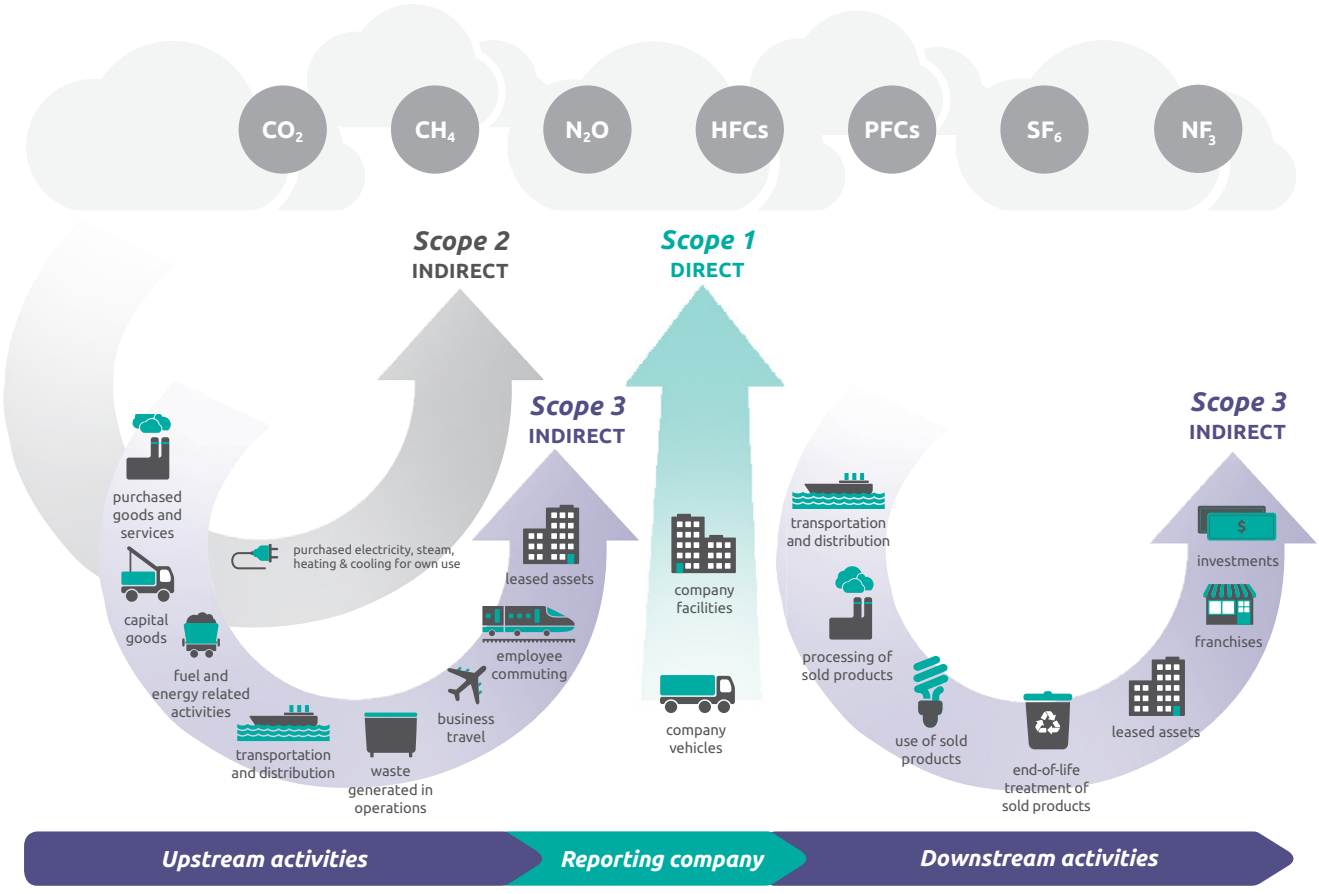


Figure 1: Greenhouse gas protocol scopes

Note: Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), hydrofluorocarbons (HCFs), perfluorocarbons (PCFs), sulphur hexafluoride (SF_6), Nitrogen trifluoride (NF_3)

Source: WRI and WBCSD 2004.

Scope 3 Emissions: The Life Cycle of Our Foods

Scope 3 emissions cover most of the work we do to make your favorite Kashi foods. They even include emissions needed to cook our waffles and emissions that are made if our ingredients, foods, or packaging end up in a landfill.

To keep track of it all, Scope three emissions are divided into the following categories.

Category 1 – Purchased Goods and Services
Emissions from growing, shipping, cooking, and storing our ingredients, cooking and storing our foods, making and shipping packaging, and other activities we pay for that are not included in categories 2-8 below.

Category 2 – Capital Goods
Emissions from the creation and transportation of Capital Goods (like buildings, machinery, or furniture) owned by Kashi.

Category 3 – Fuel and Energy Related Activities
Emissions from the extraction, creation, and transportation of fuels and energy purchased by Kashi that were not counted in scope 1 or scope 2

Category 4 – Upstream Transportation and Distribution
Emissions from transportation and distribution services owned by Kashi including moving our foods from our facilities to our warehouses or distribution centers.

Category 5 – Waste Generated in Operations
Emissions from waste made in facilities and manufacturing plants that Kashi doesn't own.

Category 6 – Business Travel
Emissions from business travel in vehicles not owned by Kashi.

Category 7 – Employee Commuting
Emissions from employee commuting in vehicles not owned by Kashi

Category 8 – Upstream Leased Assets
Kashi has no upstream leased assets to account for

Category 9 – Downstream Transportation and Distribution
Emissions from transportation and distribution of our foods from the grocery aisle to your home.

Category 10 – Processing of Sold Products
Kashi has no processing of sold products to account for

Category 11 – Use of Sold Products
Emissions from storing and cooking our waffles at home

Category 12 – End-of-Life Treatment of Sold Products
Emissions from the Kashi foods and packaging that end up in your trash.

We compare all our carbon reduction efforts to our 2020 carbon footprint. Each year we measure all emissions that we made between January 1st and December 31 in both the United States and Canada.

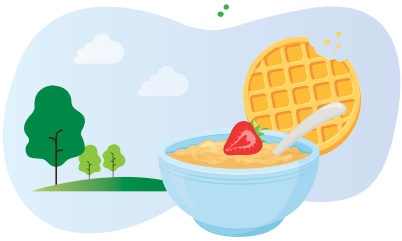
How We Talk About Our Carbon Footprint

To make the results of our carbon footprint easier to understand, our website simplifies all the above Scopes and categories by grouping our carbon footprint into the four stages of our food's life cycle:

How we Grow our foods: emissions from growing, storing, milling, and shipping ingredients to our plants.

How we Make our foods: emissions from the cooking and baking of our foods.

How we Package our foods: emissions from packaging and transportation to and storage at retailers.



How you Enjoy our foods: emissions from bringing our foods home, cooking them, and any waste.

And Now For The Methodology and Scientific Terminology

Many thanks to Carbon Trust for working with us on this project!

Methodology Overview

When collecting all the information we need to calculate our carbon footprint, it is important to be mindful that most Scope 3 emission sources are outside of our direct control and difficult to get. The GHG Protocol guidance that we follow provides guidance on different types of information we should collect in order of preference.

From Most preferable to Least Preferable Data Collection Method

1. Primary data from our value chain: Use of activity and resource use data obtained from partners within our value chain. Examples of this could include actual fuel consumption by logistics suppliers, or actual energy consumption consumed in the production of a particular garment.
2. Life Cycle Assessment: Use of LCAs for ingredients that we buy. These can then be used with data on the total volume/weight of purchased ingredients.
3. Reporting frameworks: Use of sector or activity specific emission factors multiplied by known total volume of goods.
4. Environmentally Extended Input / Output data (EEIO): Uses spend data on either goods or services in $ equivalent to estimate emissions on a kgCO2e/$ basis.

Methodology by Category

Category 1a Purchased Goods and Services, Product related

Ingredients

Kashi provided a list of foods identified by SKU number (Stock Keeping Unit that represents a specific flavor and size of food) which were categorized to a higher level by line e.g., bars, cereal etc. For each SKU, Kashi provided a percentage break-down of the ingredients used in recipes along with total production volumes. This data was used to estimate the weight of each ingredient used in each product. Each ingredient was then matched to a relevant emissions factor to estimate the associated emissions. The emissions factors were best-available estimates of emissions from growing, shipping, and milling Kashi ingredients.

Following discussions with Carbon Trust, it was assumed that 12% of ingredients bought and used to make final foods is wasted at the factory level. Therefore, 12% of the estimated production volume was added to each ingredient to estimate the total volume of purchased ingredients.

In some cases, Kashi foods use a blend of grains and cereals which is produced at their own sites. In this case an emissions factor was created for the blend using the percentage composition of each ingredient in the blend recipe and the respective emissions factor for each ingredient. The estimated emission factors were then used in the food ingredient's composition and multiplied by the estimated volume of blend purchased.

Packaging

Weight/volume data was provided by Kashi for 2020 in one Excel Workbook. This consisted of tables summarizing weights of packaging materials by type and by SKU, with some information on recycled

content and recyclability. As well as material data, supplier and production locations ("City, State") were also provided.

For certain SKU numbers, no primary data on weights/volumes was available and was therefore estimated either using averages for similar product types and or, where available, using primary data for similar products (i.e., US version of a specific SKU).

Following discussions with Carbon Trust, it was assumed that 10% of packaging bought is wasted at the factory level. Therefore, 10% of the estimated packaging volume was added to estimate the total volume of purchased packaging.

In line with Carbon Trust best practice, the EU PEF method was used wherever possible. This gives credit for recycled content used in, and recyclability at the end of life of, the packaging. Where no appropriate emission factors were available for a specific material type, the "Cut-Off" method was used instead.

Category 1b Purchased Goods and Services, Non-product related

Non-product related spend (category 1b) was extracted from parent company files. 2% of total spend for this category was considered for calculating emissions associated with the Kashi brand. The data Kashi provided to The Carbon Trust also contained other spend information, such as product (category 1a) and transport (categories 4 and 9), which were excluded to avoid double-counting emissions for those categories, as a different approach was taken. Furthermore, any spend on co-manufacturers was also excluded as this has been calculated separately and included under category 1a. Following the EEIO factor approach, spend data (in $) was multiplied by relevant emission factors, which was then multiplied by 2% to estimate Kashi's share (see calculation below) $CO2e\ emissions\ from\ non\ product\ related\ goods$ = ∑($Procurement\ Spend\ on\ Non\ Product\ Related\ Goods$ ($) $Parent\ Company$ × $EEIO\ factor$ ($kgCO2e$/ $)$Industry\ average$) × 2%

Category 2 Capital Goods

The same data sources, and methodology as 1b – Purchased Goods and Services, Non-product related has been used for the calculation of this category.

Category 3 Fuel and Energy Activities

Emissions are calculated by multiplying fuel and electricity consumption quantities by relevant WTT and T&D emission factors, ensuring quantities match scope 1&2.

$CO2e\ emissions\ fuel\ and\ energy\ related$ = ∑($Energy\ consumption$ × ($WTT\ factor$ ($kgCO2e$/unit)$Fuel\ type$ +T&D factor (kgCO2e/unit)$Country$))

Once calculated for each site, energy and fuel related emissions were then assigned to each SKU. Each site does not solely produce Kashi food with production split across other brands. Therefore, this calculation used the total production volume for each Kashi SKU at each site divided by the total production at the site, to give a Kashi emission % allocated to SKU.

Category 4 Upstream Transportation and Distribution

For upstream transportation of ingredients. It was assumed that any routes within North America would be undertaken by road using an average diesel HGV. For routes outside of North America, the overall distance was split between shipping and road based on the specific route. For shipping an average bulk carrier emission factor was Scope 3 Methodology Document – Kashi | 27 used. The emission factor unit is tonne.km therefore, the calculation multiplies the emission factor with the estimated distance travelled and the weight of the raw material. As with category 1a, it was assumed that 12% of ingredients and 10% of packaging bought and used to make food is wasted at the factory level. Therefore, 12% of the estimated production volume for ingredients and 10% for packaging volumes were added to estimate the total volume of purchased ingredients and packaging.

For the transportation of finished food between the manufacturing site and regional distribution centres, it was assumed that finished food would be transported to the nearest location using the provided logistics network map.

$CO2e\ emissions$ for $upstream\ transportation$ =

∑($Average\ distance\ travelled$ (km) $Mode\ of\ transport$ × Weight of raw material (tonne) × $Emission\ factor$ ($tonne.\ km$)$Mode\ of\ transport$)

For the emissions from storing finished food at warehouses, the total storage space required for all finished food was calculated based on an average pallet size, total number of pallets transported and average warehouse emission factor per day and per m2. Both an ambient and refrigerated emission factor was used, depending on the refrigeration need of the individual product. Additionally, it was assumed that food would be stored at the warehouse for 7 days, which was confirmed by Kashi representatives.

$CO2e\ emissions$ for $warehousing$ =

∑($Storage\ space\ required\ per\ pallet$ (m2) × Number of pallets sold that year × Average storage time (days) × $Emission\ factor$ for storage ($tCO2$)$per\ m2\ per\ day$)

Category 5 Waste Generated in Operations

When the total tonnage of waste has been provided, along with details on waste type and the end-oflife treatment, the volume of waste is multiplied by the appropriate emission factor, based on disposal method and waste type.

$CO2e\ emissions\ waste\ from\ operations$ =

∑($Volume\ of\ waste$ (t) $Type\ of\ waste$ × $Emission\ factor$ ($kgCO2e$/t)$Type\ of$ waste and end fate)

Once calculated for each site, waste related emissions were then assigned to each SKU. Each site does not solely produce Kashi food with production split across many other brands. Therefore, this calculation used the total production volume for each Kashi SKU at each site divided by the total production at the site, to give a Kashi emission % allocated to SKU.

Category 6 Business Travel

Business travel data was calculated through compiling data from air travel reports from Kashi's parent company's travel service to capture air mileage. However, this air mileage did not stipulate the particular flight class (economy, business, etc.) nor whether flights were long haul or short haul. An average unknown flight type/class has been used to represent the activities recorded. Emissions for Kashi were then estimated using Kashi percentage of their parent company's employees for North America using the following equation:

$CO2e\ emissions\ from\ business\ travel$ =

$\sum(Distance$ (km) $Mode\ of\ transport \times Emission\ factor$ ($kgCO2e$/pkm)$Mode\ of\ transport)$

Emissions related to other modes of business travel (i.e., rail and road) and emissions from hotel stays were not included due to lack of data and assuming that these emissions would be de minimis.

Category 7 employee commuting

Average emissions for commuting by country classification and commuting distance have been calculated by the Carbon Trust. These are multiplied by the total number of employees for Kashi North America.

$CO2e\ emissions\ from\ employee\ commuting$ =

$\sum(Number\ of\ employees$ (#) $Country \times Emission\ factor$ ($kgCO2e$/employee)$Country)$

There is a high level of assumption in this calculation reflective of these category's low impact.

Category 8 Upstream Leased Assets

Kashi has no upstream leased assets to account for.

Category 9 Downstream Transportation and Distribution

For downstream transport emissions, an agreed set distance of 200km between each distribution center and retail location was multiplied by the total volume transported and by a road transport emission factor in ton. kilometer. For retail emissions, the number of cases sold for each specific SKU, which was converted into kg using the weight per case, was multiplied by the appropriate retail emission factor depending on whether the product is stored in a fridge, freezer or at ambient temperature.

Category 10 processing of sold products

Kashi has no intermediate product that have been sold for further processing.

Category 11 use of sold products

Frozen waffles and entrees are assumed to have indirect use phase emissions from freezing and cooking emissions.

For each SKU (Stock Keeping Unit, meaning a specific type, flavor, and package size of food), the number of servings were estimated, based on the recommended serving size on the packaging and the total volumes of product sold. The total number of servings for each product were then multiplied by the in-use energy required from freezing or heating or the amount of milk required per serving to give the total electricity and/or milk required for each product. These figures were then converted into emissions using the relevant regional electricity and milk emission factors:

$CO2e\ emissions\ from\ Use\ of\ Sold\ Products$ =

∑(($Number\ of\ servings$ (#) $Product$ × Energy use required for heating or freezing (kWh)$Product$ × $Emission\ factor$ ($kgCO2e$/kWh)$Country$)

Category 12 end of life treatment of sold goods

For ingredients, 8% of the purchased volume is assumed to be wasted by the consumer, based on an adjusted national average food waste figure of 31%. Of this 56% is assumed to be disposed to landfill, 12% to combustion, 4% to composting and 28% to other, where a value for anaerobic digestion is used.

For packaging, the data used in the calculations is based on total volumes of packaging going to the end consumer and it was assumed that 100% of this packaging would be disposed of by the consumer.

For packaging, the total volumes being disposed of by the consumer were then multiplied by the assigned end of life emission factor based on the packaging type.

$CO2e\ emissions\ from\ End\ of\ Life\ of\ sold\ products$ =

∑($Packaging\ type\ volume$ (Kg)$Product$ × $Emission\ factor$ for assigned end fate ($kgCO2e$))

For ingredients, a food waste emission factor per ton was calculated for each ingredient, based on the percentage that each ingredient contributes to the overall recipe, the food waste emission factor and the % of food wasted. These emission factors for each ingredient were then added up for each SKU to give a food waste emission factor per SKU, which was then multiplied by the total production volumes per SKU.