

Assessment of Carbon Footprint for Oatly products by CarbonCloud

CarbonCloud has calculated the carbon footprint of Oatly's products. This document gives a short summary of how the calculations were done and what is included.

An attributional approach to life cycle accounting

We use the so-called "attributional" approach to life cycle accounting. This means that all processes used to produce a product are considered, and their combined climate impact is attributed to the product. This contrasts to the "consequential" approach, which is used to assess the climate impact from changing the level of output of a product.

From cradle to store

We assess the climate footprint of the product from "cradle to store". In this case it means that we consider all steps of the life cycle up until the product reaches the gate of the grocery store. Hence, the calculated climate footprint does not consider e.g. lighting and refrigeration at the grocery store, transport from grocery store to home, cooking of product or disposal of packaging.

What is included?

The climate footprint includes emissions from:

- **Agriculture:** The agricultural production of oats and rapeseed
- **Transport:** The transport chain of inputs from field to factory, and of the final product from factory to market
- **Process:** Electricity and gas consumption in the mill, in the rapeseed oil factory, in the Oatbase production facility, and at the Oat drink production site.
- **Packaging:** production and transport of packaging
- **Other ingredients:** Oatly's products consist mostly of oat, rapeseed and water. The remaining ingredients (salts and vitamins) constitute <1% by weight. Emissions from these ingredients are given as a crude estimate.

Agriculture

For most of Oatly's products, the agricultural step accounts for the largest part of the total emissions, out of the four categories agriculture, transport, process and packaging. Emissions from the agricultural step are calculated with a computer model. For the carbon footprint of Oatly's product the model calculates:

- Emissions of nitrous oxide (N₂O) from mineral soils
- "Indirect" emissions of nitrous oxide (N₂O) related to ammonia and nitrate emissions from soils
- Emissions of nitrous oxide (N₂O) and carbon dioxide (CO₂) from organic soils
- Carbon dioxide (CO₂) emissions from production and use of fuels (e.g. for tractors and machinery) and electricity
- Emissions of carbon dioxide (CO₂) and nitrous oxide (N₂O) from production of mineral fertilizers and other inputs

Transport

The transport stage includes:

- Transports of oats, from field to mill and from mill to the Oatbase production facility (at ambient temperature)
- Transport of rapeseed from field to factory, and rapeseed oil from factory to the Oatbase production facility (at ambient temperature)
- Transports between the Oatbase production facility and the Oat drink production site (refrigerated)
- Transport to market (refrigerated or ambient depending on product)

Process

We assume that the heat consumption in the oat mill is generated from combustion of oat hull residues. The emission intensity of electricity consumed in Sweden corresponds to the Nordic power mix. The emission intensity of electricity at the production sites situated elsewhere was given by Oatly. Gas demand in the Oatbase production facility is met with biogas with zero emissions. Gas demand at the oat drink production sites is met with fossil gas.

What is not included?

Most importantly the calculations omit

- Capital goods (e.g., manufacture of machinery, trucks, infrastructure)
- Corporate activities and services (e.g., research and development, administrative functions, company sales and marketing)
- Transport of employees to and from works
- Production, transport and leakage of refrigerants from the Oatbase production facility

We estimate that emissions from these sources are small compared to the total, and therefore can be neglected.

Time

The cultivation of oats and rapeseed represent year 2017.

Geography

Data on production of oat and rapeseed represent average Swedish conditions.

The weighting of greenhouse gasses

The total climate impact is given in CO₂ equivalents. All greenhouses gases are weighted with the latest values of GWP₁₀₀ given by IPCC.

Allocation

When a process generates more than one product, the climate impact from the process needs to be allocated between the products. Most important for the Oatly calculations is that rapeseed oil and rapeseed cake are produced in the same process. Here we use economic allocation. This means that the climate impact from a process is allocated between the products in proportion to their economic value.