Avoided Pressures-Environmental Methodology

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1. Introduction

Efforts to promote sustainability are increasingly focused on assessing and mitigating environmental pressures across impact areas. One approach is the calculation of **avoided pressures**, which quantifies the environmental burdens prevented through the implementation of sustainable technologies, resource-efficient practices, or policy interventions. Unlike direct impact reductions, which focus on minimizing an entity's footprint, avoided pressures assess the difference between a reference scenario (what would have occurred without intervention) and a solution scenario (the improved outcome achieved through specific actions).

This methodology document outlines the approach used to quantify the avoided pressures on climate impact, land occupation and water withdrawal from our products for the 2024 reporting year. It includes the scope and boundaries, the approach and considerations, the modelling and calculations, and the limitations of the assessment.

To conduct this assessment, Flora Food Group commissioned Quantis, a leading environmental sustainability consultancy, to develop a comprehensive approach to assess avoided pressures across climate, land, and water impact categories for three key product groups. To enable this assessment, Quantis reviewed existing guidelines (Aboukrat et al., 2022; ADEME, 2024; WBCSD, 2023) to develop a robust formula and Excel model for calculating avoided emissions related to climate. This approach was then adapted for land & water, requiring additional groundwork and alignment on what constitutes avoided pressure for these two indicators.

To complement this methodology, Quantis also conducted a benchmark analysis to evaluate how companies in the Food & Beverage sector, as well as other industries, communicate avoided pressures. This analysis was used to support Flora Food Group in defining credible communication claims and determining the parameters included in this assessment.

2. Results

The avoided pressures assessment allows Flora Food Group to quantify the benefit of our products (plant-based and blended) compared to a representative market mix of dairy and non-dairy alternatives resulting in reduced burdens on climate and nature (land use and water withdrawal).

***Table 1**: Avoided Pressures Results*

Avoided Pressure	Unit	Flora Food Group Portfolio	This is equivalent to …*
Avoided GHG Emissions	million tonnes CO2-eq	**2.7**	…the CO_2-eq emissions from over **two years** of **electricity usage in Amsterdam**.
Avoided Land Occupation	km²a	**4,028**	….the land area the size of approximately **1,180 New York City's Central Parks**.
Avoided Water Withdrawal	million m³	**67.5**	...the water volume sufficient to fill more than **27,000 Olympic-sized swimming pools.**

* Climate equivalency is based on 1,190 kt CO2e emissions from electricity in the city of Amsterdam in 2022. Land equivalency assumes 3.41 km2 as the area of Centra Park in New York. Water equivalency assumes 2,500 m3 of water per 1 Olympic size swimming pool.

3. Scope and Boundaries

The scope aligns with Flora Food Group's 2024 carbon corporate footprint.

Reporting Period: For 2024 calendar year (based on 12-month Moving Annual Total as reported in Sept 2024).

Product Categories:
The product categories and representative Stock Keeping Unit (SKUs) are outlined in Table 2 below. The geographies covered align with the regions where Flora Food Group holds market share.

Table 2: *Product categories covered in the assessment (Numbers are rounded down to nearest 0 or 5)*

Product category	SKU coverage
Butters and spreads	Over 75 SKUS, representing ~50% of category sales and volume
Creams	Over 45 SKUs, representing ~50% of sales revenue / ~45% of sales volume
Cheeses	Over 160 SKUs, representing ~45% % of sales revenue and ~35% of sales volume

4. Approach and Considerations

4.1 Impact Categories

This assessment expands beyond conventional avoided emissions calculations, which typically focus only on climate change. In addition to climate, Flora Food Group's approach incorporates land use and water use (Table 2), reflecting their critical role in addressing nature loss, enhancing biodiversity, and meeting compliance with frameworks such as SBTN, TNFD, and CSRD (see Table 3).

By assessing these three impact categories, Flora Food Group demonstrates a more comprehensive understanding of its environmental performance, and alignment with global reporting requirements and corporate sustainability goals.

Table 3: *Impact categories covered in Flora Food Group's avoided pressures assessment*

Assessment categories	Mandatory pressure indicators to assess	Pressure indicators assessed	Definition of the indicator	Source (Tool/ LCA Method used)
Climate change	Greenhouse gas emissions	Radiative forcing as Global Warming Potential (GWP100): kg CO_2 eq	This indicator measures the contribution to the greenhouse effect of the various greenhouse gases	EF method 3.1

			(GHG) emitted during the life cycle.	
Land occupation	Area (km^2 or ha) converted by ecosystem use	Land occupation: m^2 of land occupied	Sum of the surface used per year for the considered unit.	Based on EF method 3.1
Water withdrawal	m^3 of water withdrawn	Water withdrawn: m^3 of freshwater withdrawn	Sum of all the volumes withdrawn from groundwater or surface water.	Impact World+

The Lifecycle Assessment (LCA) analysis on which the avoided pressures assessment is based on captures both water consumption and water withdrawal. In an effort to be consistent with previous LCA analysis, Flora Food Group will continue to report on water consumption in comparative product LCA claims. Flora Food Group focuses on water withdrawal for avoided pressures.

***Table 4**: Flora Food Group indicators are aligned with core indicators from SBTN, CSRD and TNDF*

	Flora Food Group indicators	SBTN	CSRD – ESRS 1, 3 & ESRS 4	TNFD
CLIMATE CHANGE	**GHG emissions (GPW 100) (CO_2 eq / kg)**	**GHG emissions (GWP 100)**	**Absolute gross GHG emissions classified as Scope 1, Scope 2, Scope 3 (GWP100)** Scope 1 and 2 GHG emissions disaggregated between emissions from the consolidated accounting group and the other investees (associates, joint ventures, unconsolidated subsidiaries) and Scope 2 emissions per location	**Gross Scopes 1, 2, 3 and Total GHG emissions - GHG emissions per scope (GWP100)** GHG emissions - by country, operating segments, economic activity, subsidiary, GHG category or source type
FRESHWATER QUANTITY	**Freshwater withdrawal (m^3 / kg)**	**Freshwater withdrawals (m^3/yr)** Freshwater availability max indicator from SBTN State of Nature layers	**Total water withdrawals (including freshwater withdrawal) (m^3/yr)** Total freshwater consumption (m^3/yr) Total water recycled and reused (m^3/yr) Total water consumption & sites located in areas at water risk, including areas of high-water stress (m^3/yr)	**Water use (including freshwater withdrawal)**

LAND FOOTPRINT	**Land occupation (m^2a / kg)**	**Land use intensity of agricultural products (m^2/kg)** **Agricultural land use for direct operations and upstream activities (m^2)**	**Total use of land area** Total sealed land Nature-oriented area on site Ecosystem area coverage and management	**Land-use intensity by production type** Total surface area controlled/managed by the organization, where the organization has control (km^2) Extent of land ecosystem that is sustainably managed (km^2) by type of ecosystem and business activity

Note: **In bold**, are the framework indicators aligned with Flora Food Group indicators. This table is not exhaustive for CSRD and TNFD sector-specific requirements.

4.2. Differences between emissions, impact, and pressures

Environmental pressures — such as emissions, land use, and water withdrawal — can affect ecosystems differently, depending on their current state. A degraded ecosystem (poor state of nature) will be more vulnerable to further pressures, while a healthy, biodiverse ecosystem can better withstand disturbances and recover more easily.

The following definitions, based on the Science-Based Targets Network (SBTN), provide clarity on key concepts used in this assessment:

- ***Pressure* refers** to human activities that alter environmental and ecosystem states, encompassing ecosystem use and change, resource exploitation, climate change, pollution, and invasive species.
- ***Land occupation*** quantifies agricultural land used annually, expressed in hectares per year, for a company's production. In communications, the term land footprint is used synonymously.
- ***Land use*** includes the various human activities and purposes assigned to land, such as grazing, timber extraction, and conservation.
- ***Water withdrawal*** refers to the total freshwater taken from natural sources, excluding water used solely for hydroelectric power, while ***water consumption*** represents the net balance of water withdrawn versus water released.

For this assessment, the following terminology has been adopted:

- **Avoided emissions** specifically refers to avoided pressures related to climate change
- **Avoided pressures** refers to pressures from land occupation and water withdrawal, as well as an overarching term to encompass all three impact categories.
- The term ***Avoided impact*** has been intentionally excluded to maintain consistency with the broader definition of nature impact, which refers to changes in the state of nature caused by pressures exerted by an activity.

4.3 Considerations for avoided pressure assessment

While few guidelines currently exist for assessing avoided pressures beyond avoided emissions on climate, this assessment follows the principles outlined in the **WBCSD draft guidelines on avoided emissions** (*WBCSD. Net-Zero Inititiative, 2023*). The eligibility criteria defined in these guidelines have been reviewed and applied to ensure a robust and credible methodology. Initially designed for avoided emissions, they are also applicable to avoided pressures for land and water.

4.3.1 General criteria for eligibility to account for product avoided emissions

WBCSD guidance states companies must follow the three eligibility criteria to make any avoided emissions claim. A company must demonstrate climate action credibility (Gate 1), alignment to the latest climate science (Gate 2), and the solution must have a direct and significant decarbonization impact (Gate 3).

- **Climate action credibility (Gate 1 and 2)**

Flora Food Group has set science-based targets, approved by the initiative in 2024, and tracks emissions across scopes 1, 2, and 3. The company also reports its corporate carbon footprint annually aligned to CSRD requirements ensuring transparency and goes beyond basic climate impact reporting.

- **Solution action legitimacy (Gate 3)**

Plant-based or blended (plant-based with some animal-based ingredients) alternatives to animal-based products are recognized as key contributors to the 1.5°C global pathway for food systems transformation. These alternatives are classified as direct, end-use solutions for decarbonization, meeting legitimacy criteria for calculating avoided emissions.

4.3.2 General criteria for communication best practices

- **Reporting**

Prior to this assessment, Flora Food Group has already reported avoided GHG emissions (referred to as “scope 4”). The company always did so separately from scopes 1, 2, and 3 and in line with the WBCSD criteria, it did not make any claims regarding carbon neutrality of the company or its products.

Moving forward, the term “scope 4” will not be used in future reporting, as it is recommended in the WBCSD draft guidelines.

- **Scope of avoided pressures**

As per WBCSD requirements, Flora Food Group’s avoided pressures are associated with specific products (solutions) and are communicated as a percentage of total sales that those solutions generate. For 2024, total avoided pressures representing 100% of the portfolio are communicated in Flora Food Group Annual Report 2024. (*See the company website for the publication*).

- **Tracking**

Flora Food Group reports its corporate footprint annually, incorporating any portfolio changes, and intends to use the Quantis-developed model for avoided pressures assessment to annually update those calculations, too.

4.3.3 Calculation methodology

4.3.3.1 General criteria for calculation

- **Quantification approach**

Flora Food Group uses a “cradle-to-grave” approach, which is forward-looking and adheres to ISO standards, ensuring comprehensive coverage from the production phase to end-of-life of a product.

For short (< 1 year) lifetime products, as in the case of Flora Food Group, there is no need to integrate prospective modelling - a forward-looking approach that estimates future avoided pressures based on anticipated changes in production, markets, or technology - in the assessment of avoided pressures.

- **Scenarios and rebound effect**

Scenario analysis plays a central role in calculating avoided pressures. Flora Food Group has conducted several LCAs (*see Section Modelling and Calculation*) and uses these results to incorporate scenario analysis, which enhances the avoided pressures calculations by addressing various demand and supply conditions. The next sections provide explanations of how the reference scenarios were built.

Rebound effects are effects related to reducing environmental impacts in one area which could inadvertently increase them in another. In the case of Flora Food Group solutions (i.e. their products), rebound effects (i.e. increased use of their products because of their lower pressures on the environment, which partly or fully cancel out the initial avoided pressures intended by the solution), are not expected to be significant.

4.3.3.2 Considerations for climate change

The approach to calculating GHG emissions for Flora Food Group relies on market share data rather than a simple direct comparison with a dairy product. This approach begins with defining a reference scenario that includes a percentage of dairy and alternative (non-dairy, including blends) products, estimating the emissions (in $kgCO_2eq$) produced per litre or kilogram of a reference average scenario in a specific country for 2024. This is then contrasted with the emissions from Flora Food Group SKUs, also estimated in $kgCO_2eq$ per litre or kilogram in the same country and year. The formula multiplies this emissions difference by the annual sales volumes of the product, expressed in physical units, to calculate the avoided pressure on climate.

4.3.3.3 Considerations for land and water

The approach for calculating avoided land occupation and water withdrawal is designed to provide a clear method for Flora Food Group to quantify its avoided pressure on the environment by comparing conventional product with Flora Food Group’s products.

The calculation considers a reference scenario that includes land pressure associated to a percentage of dairy and non-dairy products, alongside Flora Food Group’s land pressure for plant-based and blended production. The formula multiplies these factors

by annual sales volumes, considering the land area (in square meters) occupied for producing one litre or kilogram of both the conventional product and the alternative plant-based or blended product within a specified country for 2024. The result is an avoided land occupation figure, representing the land that Flora Food Group products would save without factoring in local ecosystem conditions.

This approach will similarly apply to water withdrawal calculations, allowing for a consistent method to assess the reduced water use by switching to plant-based and blended alternatives. Country-level – SKU-level results are then aggregated to determine a global avoided land occupation value.

5. *Modelling and Calculations*

As described in the section above, the key elements used in the calculation of avoided pressures of Flora Food Group products include the market share information and the emission factors of the products considered. The sections that follow provide more information on how these were addressed.

5.1 Product LCA Tool description

In 2022, in collaboration with Quantis, Flora Food Group developed a P*roduct Life Cycle Assessment (LCA) Tool* that allows the company to study the environmental impacts of its products from cradle to grave. The tool and the methodology used to perform the LCAs are aligned with PEF methodology and ISO 14040 and 14044 standards for public disclosure of results. The tool has been peer reviewed by a panel of three independent experts on topics such as LCA, agronomy and dairy production and is regularly updated to ensure alignment with latest scientific advancements.

The tool enables Flora Food Group users to input key product-specific parameters, such as recipe composition, manufacturing location, packaging type, and distribution markets across Europe and North America, to generate accurate footprint calculations. The functional unit is defined as one kilogram of product, reflecting the typical one-to-one substitution of animal-based products with plant-based or blended alternatives. It is also in line with previous Flora Food Group product footprint assessments.

It is the Product LCA Tool that is used to generate the emission factors for the butters and spreads and creams. For the emission factors (EFs) of cheeses, a dedicated ISO-compliant study was used (*See Section 5.2.3 and Violife Study on website for more detail*).

In addition to providing the emissions factors for the calculation of avoided pressures, the Product LCA Tool is used to calculate individual comparative LCA claims which may be viewed on Flora Food Group's brand websites and support a general portfolio claim. (*See Flora Food Group Portfolio Claim document on their website for more detail*).

5.2 Reference scenario

The market structure is made up of three key product segments:

- Dairy
- Non-dairy competitors (including blends that contain some dairy)

- Flora Food Group (plant-based and blends).

The reference scenario represents, in a given country, the three product segments, Flora Food Group and non-Flora Food Group market shares, as well as their corresponding EFs as follows:

$$\textit{Reference scenario} = (\%\ \textit{Dairy Market Share} \times \textit{Dairy EF}) + (\%\ \textit{Non-Dairy Competitors Market Share} \times \textit{Non-Dairy EF}) + (\%\ \textit{Flora Food Group Market Share} \times \textit{Flora Food Group weighted EF})$$

For alternative products, an alternative approach was adopted using assumption based on market share of such products. This method involved calculating an average product profile based on market shares of alternatives at the country level and incorporating region-specific EFs. A stepwise methodology was applied, prioritizing the most granular data available and progressively using less granular data where necessary for each product category.

5.2.1 Butters and spreads

- Country level market share data sourced from external market insight providers (such as Nielsen) was applied for most operating markets; Brazil, Mexico, Colombia, and Indonesia use Statista data for 2024 volumes for dairy and non-dairy markets, covering butter, edible oils and margarine.
- The Product LCA Tool enables the development of emission factors specific to Flora Food Group product category x country combination. The EF is then weighted, based on SKU volumes for a specific country.
- Flora Food Group EFs are applied to competitors (i.e. other manufacturers of plant-based alternatives to dairy butter including blends that contain some dairy). Dairy EFs are calculated in the Product LCA Tool and are based on the WFLDB 3.9 and ecoinvent 3.9 LCA databases.

5.2.2 Creams

- Where possible, Flora Food Group market share data was constructed and used for creams product segment (cooking, crème fraiche, whipping).
- When information was not available, assumptions were taken on market share split via desktop research on company, product names and ingredients for the classification of products. This new classification allowed us to get market shares for non-dairy (plant-based / blends) and dairy products.
- An average global split from Flora Food Group market shares at 72% dairy / 28% non-dairy split for companies with missing data was applied.
- Other options were considered but not pursued due to feasibility concerns:
    - Using plant-based market penetration values, which would significantly overestimate avoided pressures, as these values are based on global revenues rather than specific countries where Flora Food Group operates.
    - Assigning product segments to non-dairy, blends, and dairy categories.
    - Assuming 100% market share is held by Flora Food Group.

- Flora Food Group EFs are applied to competitors (i.e. other manufacturers of plant-based alternatives to dairy cream). Dairy EFs are calculated in the Product LCA Tool and are based on the WFLDB 3.9 and ecoinvent 3.9 LCA databases.

5.2.3 Cheeses

- For cheeses, Flora Food Group possesses country-level data classified by market share for Flora Food Group, other non-dairy cheeses, and dairy.
- To obtain the EFs for Flora Food Group cheeses, the existing ISO compliant LCA study "*Violife 100% vegan alternative to cheese vs. dairy cheese in Europe, UK, US, Canada and Japan"* was used (and updated to WFLDB 3.9 and ecoinvent 3.9 EFs).
- For products not included in the Violife study, products that share similar core recipes were used as proxies. The final EF is a weighted EF based on SKU volumes for a specific country.
- This Flora Food Group EF is also applied to competitors, i.e. other producers of plant-based cheeses.

This methodology aims to provide a balanced view of avoided pressures by using a data-driven approach to reflect the broader market impact.

5.3 Equivalencies

To communicate the magnitude of the results, globally known references were used and multiplied to reflect the figure in the results table.

- Climate equivalency is based on 1,190 kt CO2e emissions from electricity in the city of Amsterdam in 2022. (Source: https://assets.amsterdam.nl/publish/pages/943415/climate_report_2023.pdf)
- Land equivalency assumes 3.41 km^2 as the area of Centra Park in New York. (Source: https://www.centralparknyc.org/park-history)
- Water equivalency assumes 2,500 m^3 of water per 1 Olympic swimming pool. (Source: https://en.wikipedia.org/wiki/Olympic-size_swimming_pool)

6. Limitations of the Assessment

We strive to continuously work on utilizing good quality data in our assessments. However, there will always be limitations due to various factors. To ensure robustness of our disclosure, we share the limitations of the assessment below.

Table 5 *Limitations of the assessment*

Limitations	Description	Implications
Product category split	Blend products in butter and spreads and creams are part of Flora Food Group's market share. Exact blend composition was unknown for competitors and proxies were taken to estimate competitor EFs in the reference scenario.	Competitors' blends were assigned the same EF as Flora Food Group's SKUs for each country. Until we have exact competitor data, this assumption may lead to conservative estimates of avoided pressures or overestimation.

Market share	• Butters and spreads: Country-level splits between dairy, non-dairy and blends were used. • Creams: Markets shares calculated based on desk-research on company names and main product lines (e.g. main volumes from non-dairy/blends or dairy). • Cheeses: Country-level splits between dairy and plant-based cheeses were used	Acceptable assumptions on market shares are essential to calculate an accurate reference scenario. We followed a hierarchal approach of using the most granular data at country level when possible and filling data gaps when needed based on assumptions.
Volume	The analysis of avoided pressures was conducted based on a share of the total volumes sold by Flora Food Group. • Butters and spreads – Over 75 SKUS, representing ~50% of category sales and volume • Creams – Over 45 SKUs, representing ~50% of sales revenue / ~45% of sales volume • Cheeses – Over 160 SKUs, representing ~45% % of sales revenue and ~35% of sales volume	In this work, calculations were performed using around 50% NSV, and values for 100% NSV were extrapolated. For the extrapolation, regional averages were used where available; otherwise, global averages were applied as proxies. All SKUs that have larger than zero sales volumes and NSV are included in the extrapolated results. The extrapolated results are adequately marked in the claim and the accompanying text on the study background.
Communication claims	While the communication claims are as detailed as possible, they do not include a description of potential negative side and rebounds effects, and description of actions to mitigate these.	Rebound effects are not expected to be significant for Flora Food Group products. Current claim wording on avoided pressures will be calculated on a yearly basis (with no claim on future predictions).

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Annex A - Main differences between avoided pressure and comparative product LCA claims

Aspect	Avoided Pressures	Comparing LCA studies
Objective	Quantifies GHG emissions or pressures prevented by a solution compared to a baseline.	Examines environmental impacts of two systems to identify trade-offs or lower impacts.
Methodology	Establishes a reference (baseline) scenario and calculates net reductions.	Ensures functional equivalence and compares systems using life cycle analysis.
Data requirements	Data for the studied system and baseline, often using market-level or predictive data.	Detailed life cycle inventory (LCI) data for both systems being compared.
Scope of results	Expressed as absolute emissions /pressure avoided (e.g. tons of CO_2e or water withdrawal) relative to a baseline.	Relative comparison across multiple impact categories (e.g.GHGs, water use).
Interpretation and use	Highlights benefits of a solution (e.g. renewable energy) in climate or policy contexts.	Guides decision-making for eco-design, product development, or policy planning.