PANGAIA

How we use Impact Data

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We strive to use the best available, credible and substantiated data. While we seek primary data, this is not always possible due to access. We are committed to continuously improving our data quality and will always provide environmental and social context to aid interpretation.

Scope 1, 2, 3 GHG Emissions Partners:

We have applied the 2021 UK DEFRA environmental reporting guidelines as our methodology. We have used emission factors from UK Government Conversion Factors.
An operational control approach has been used for the organizational boundary.

There is no exclusion in our methodology.

Independent verification: Our data have not been independently verified, but we have worked with consultants from Carnstone to collect data and apply a recognized methodology.

Normalization: We have chosen to report gross Scope 1, 2 and 3 emissions tons of CO2e per £m revenue as this is a common metric used in corporate greenhouse gas reporting.
Carnstone assesses our emissions data using recognized methodologies.

Additional Partners:

Carbon Footprint helps us calculate the associated GHG emissions of our retail events.

Green Story helps us with our LCAs, using the CML 2001 methodology, tag our products as climate positive and identify accredited carbon token projects to offset carbon as an interim solution on our way to reducing our footprint to Net Zero by 2040.

A little bit about Life Cycle Assessments (LCAs):

Our LCAs are calculated using the CML 2001 methodology. The CML 2001 primarily focuses on the environmental impacts associated with specific material production. As part of this assessment, we aim to include all the unit processes, all the raw material inputs (if there are several inputs for one material, all of these are modeled and represented in the final LCA), alongside measuring other inputs such as; water, energy, packaging and outputs; predominantly emissions and waste.

For all of our materials, a cradle-to-gate approach (from raw material to our distribution center) is used to evaluate environmental performance of materials[1]. The boundaries of the studied system depend on the level of data collection we can gather per material.

Our LCAs measure 13 impact categories:

Abiotic Depletion (measured Abiotic Depletion (ADP) as two metrics ADP elements & ADP fossil, respectively)	Refers to the depletion of non-living (abiotic) resources such as fossil fuels, minerals, clay, and peat.
Eutrophication	Eutrophication sets off a chain reaction in the ecosystem, starting with an overabundance of algae in freshwater systems/oceans. Algae bloom and many aquatic species like fish disappear due to excessive phosphorus concentration.

[1] Our downstream logistics are calculated within the decarbonization and broader business footprint, not LCAs.

Acidification	Acidification of water and soils occurs through the transformation of air pollutants into acids. This lowers the pH of seawater, a process known as ocean acidification.
Blue Water Consumption	Blue Water Consumption models water that has been sourced from surface or groundwater resources and is either evaporated, incorporated into a product or taken from one body of water and returned to another, or returned at a different time. This applied to irrigated agriculture, industry production and domestic water use. The amount of water abstracted from the sources, that does not return to the catchment from where it was withdrawn.
Freshwater & Marine Aquatic Ecotoxicity	This category indicator refers to the impact on freshwater ecosystems (potentially affected aquatic species), as a result of emissions of toxic substances.
Global Warming Potential (measured as two separate metrics, with and without biogenic carbon)	GWP is the measure of the amount of energy the emissions of 1 ton of a greenhouse gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO2). Biogenic carbon emissions are those that originate from biological sources such as plants, trees, and soil. Biogenic carbon emissions relate to the natural carbon cycle and there is significant interest in quantifying how plants capture CO2 in the process of photosynthesis, how it is lost in respiration and stored in biomass (both living and dead), and finally biologically sequestered into long-term biological stores in the soil. Exclusion of quantification of this sequestered carbon in a products life cycle, is termed as excluded biogenic carbon.
Human Toxicity	Reflects the potential harm of a unit of chemical released into the environment on human health.
Ozone Layer depletion	Release of chemical compounds containing chlorine or bromine gasses from industries/human activities affect the ozone layer. Effect on human health (years of life lost/disabled) related to increased skin cancer and cataract due to UV-exposure.
Photochemical ozone creation	Photochemical Ozone Creation Potential (POCP) is the potential of ozone creation at ground level (i.e. tropospheric ozone) through photochemical transformation of ozone precursor emissions. The main ozone precursor compounds are nitrogen oxides (NOx) and non-methane volatile organic compounds (NMVOC).
Terrestrial Ecotoxicity	Terrestrial ecotoxicology is the study of how environmental pollutants affect land-dependent organisms and their environment.
Primary Energy Demand from renewable and non-renewable resources	Primary energy demand is the quantity of energy directly withdrawn from the hydrosphere, atmosphere or geosphere or energy source without any anthropogenic change.

We have two main data sources: primary and secondary sources. Primary data is directly disclosed from our supply chain, and we work with our supply chain partners to gather material relevant data so we can model material impact accurately.

Secondary sources are still incredibly valuable, if we have an indication of production inputs, process and location. If we are not able to get to the specific raw material information, we use aggregate datasets from GABI to model our impacts on a regional, country or sometimes even global level. If we cannot source enough information to inform secondary data modeling, this stage will be eliminated from the scope of the LCA calculation.

The functional unit for our material assessments is set as the production of 1kg of garments. This reference unit is used as the basis for the calculation of the environmental impacts of the studied system. This means that all the parameters (material and energy consumption) used in our LCAs refer to the production of this amount of material.

Critically, our LCAs only examine a specific apparel supply chain and production processes for a PANGAIA material. The LCA insights cannot be used for any other generalized processes or products. We do not compare impacts for materials outside of consistent textile classifications i.e. we do not compare cotton to nylon.

All the reduction claims seen on site in accompanying widgets are calculated using comparative benchmarks, i.e. conventional cotton to organic cotton. These will be against industry available datasets from indexes such as EcoInvent or GABI.

We use the LCA results to inform our strategic direction & reduction target setting. Whilst we are on the journey of implementing low impact solutions, we also use the data to offset the products carbon footprint by purchasing credits. We know this isn't the end solution (more a solution of last resort), but we've chosen to offset & set reduction targets simultaneously to make use of imperfect solutions available today, and plan in better solutions over time.

Primary data sources:

- Life Cycle Inventory Data (supply chain partner disclosure)
- Logistics providers emission reports
- Expense forms and invoices to tag associated carbon emissions with activity
- Carbon surveys

Secondary data sources:

- Global Life Cycle Inventory Databases i.e. EcoInvent and GaBi
- Peer reviewed academic research and journals.