Carbon footprint - SILK and CO2

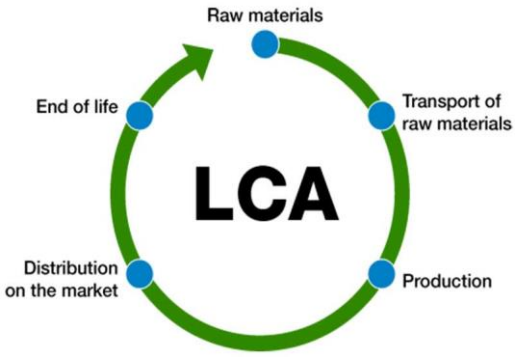
Carbon Footprint: What is it? What is it for?

A **carbon footprint** or **climate footprint** represents a modern and specific **environmental** indicator capable, with a single numerical value that represents, in a clear and objective way, the total quantity of **greenhouse gas emissions** (GHG Greenhouse Gases), converting them analytically into an equivalent quantity of **carbon dioxide CO2** (kg or Tonnes), which are generated, directly or indirectly, by a particular product but also by an activity or an organisation.

Relative to a single product, a Carbon footprint takes into account the quantities of **greenhouse gases** released over its entire life:

- extraction/production and transport of raw materials,
- transformation
- production
- logistics, packaging and transport
- use
- end-of-life, transport, disposal

A **carbon footprint** does not represent an indicator left to subjective determination or evaluation but is a precise, albeit simplified, representation of the entire life of the asset (life cycle), based on the international standardisation of rules and protocols that have merged into the **ISO 14067** standard with the determination and analysis of parameters established on an international level by the UN organisation, **IPCC** (Intergovernmental Panel on Climate Change)

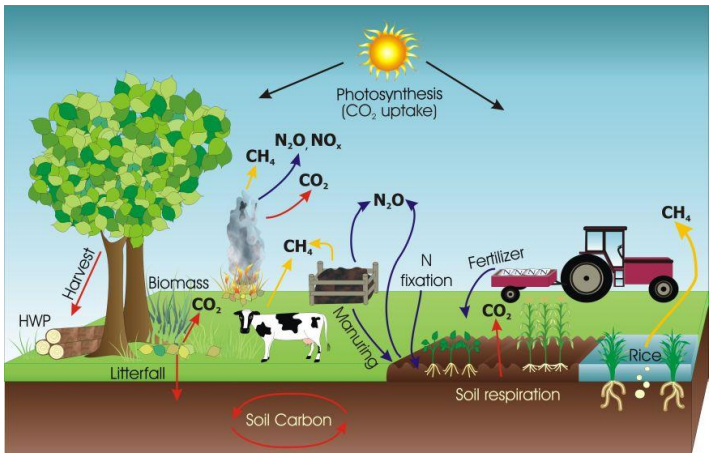


Carbon Footprint is based on the **LCA (Life Cycle Assessment)** methodology, which, mainly linked to studies and analyses in the energy sector, was established in the 1970s. Since the 1990s, it has expanded its field of action on the basis of the concept of "**life cycle**" and its standardisation has been defined. Thanks to the driving and coordinating role of the Society of Environmental Toxicology and Chemistry (SETAC), the drafting of an international standard based on ISO 14040:2006 and ISO 14044:2006 standards has been achieved.

Carbon footprint calculation guarantees an objective representation of the context in which a company, with its organisation and its products, operates and represents the necessary **starting point** for defining the positioning and planning of every single activity, including products, in the environmental field in order to implement **eco-sustainable improvement policies.**

Here is how silk can reduce the amount of CO2

The **Silk** that reaches the final consumer is the result of the combination of a highly differentiated supply chain that starts from the agricultural world linked to the cultivation of mulberry trees, passes through the zootechnical world of moth breeding that will produce the cocoons, to finally arrive at the industrial world of silk fiber production process.



Among the possible elements that can cause an increase in CO2 levels within the agricultural system, none of these can be attributable to the **silk system.** Indeed, many elements typical of this fibre allow the absorption of considerable quantities of greenhouse gases, to reduce significantly harmful emissions and to absorb a good part of them:

- The cultivation of a mulberry tree does not foresee the felling of the tree but only the use of its leaves, as the exclusive food of the silkworm, avoids the phenomena of deforestation, thus reducing CO2 emissions;
- The cultivation of the mulberry tree keeps the use of the soil and the territory regular and unaltered (1/3 of the CO2 emissions are determined by changes in land use);
- The conservation of mulberry plantations, guaranteeing higher standards of economic remuneration to farmers, as well as in some cases, being a substitute for harmful crops (opium) avoids complementary activities of intensive cultivation (corn, rice and cereals), with high production CO2 and use of natural resources (especially water);
- Fertilisers of chemical origin and with a high impact of CO2 production are not used intensively, as their eventual use, coming into contact with the moth, would cause a drop in cocoon productivity;
- One hectare (hectare = 10000 m2) of land allows the cultivation of about 13,200 mulberry trees on average. Each hectare produces 111 kg of silk fibre (1 mulberry = approximately 8.4 grams of silk fibre produced);
- Mulberry trees, through chlorophyll photosynthesis, capture 81,650 kg of CO2 per hectare per year. This is equivalent, in a production per hectare (Ha), estimated at 111 kg of fibre, to about 735 times the weight of the silk produced by mulberry trees;
- Mulberry trees are able to capture dust in the atmosphere, absorb polluting gaseous substances, volatile organic compounds (VOC) such as hydrocarbons, alcohols, aldehydes, as well as retain harmful ozone elements;

The component attributable to **zootechnics** linked to the breeding of moths to produce cocoons does not produce biomass and therefore gases harmful to the atmosphere (methane in particular) responsible for 2/3 of the greenhouse effect.

The **industrial** component of silk production belongs to the textile-clothing sector, which is the cause of a preponderant part of the global pollution level (from 2 to 10% of the European LCA). However, the silk sector

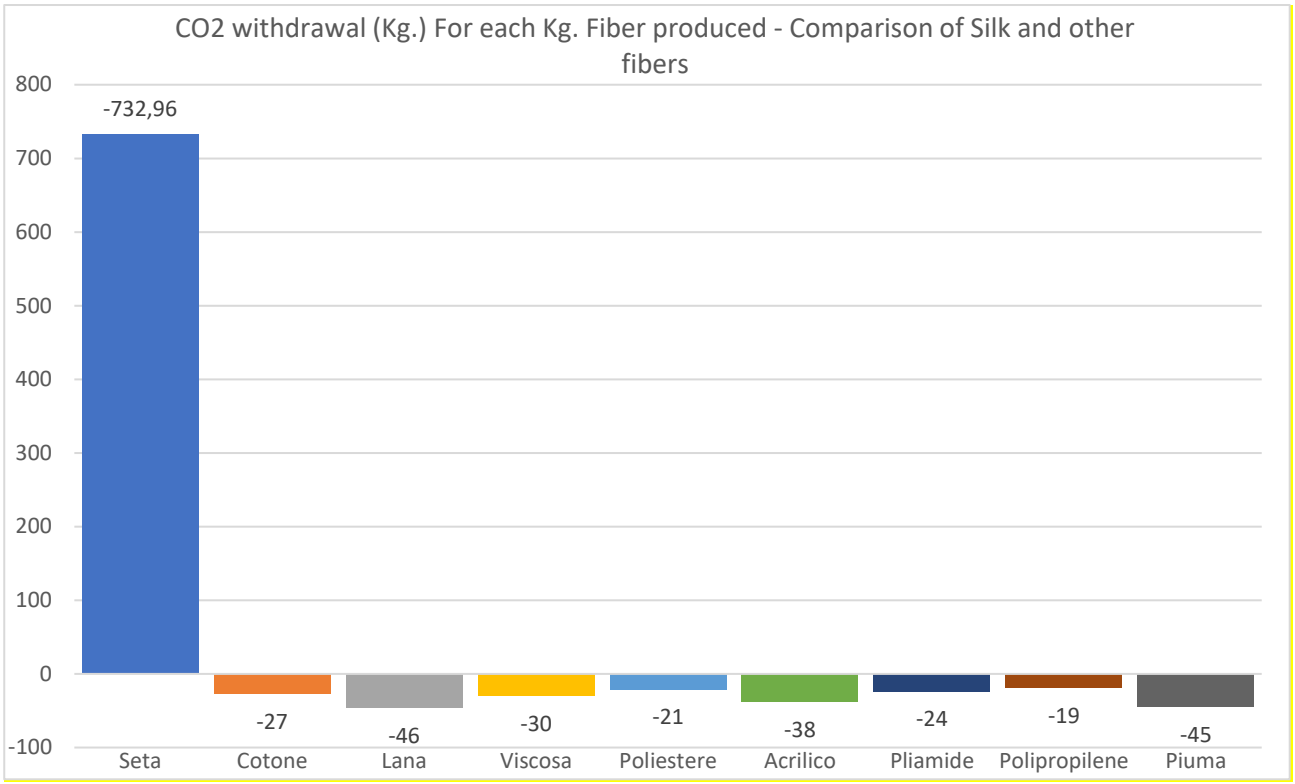
represents a very limited percentage of world production of textile and clothing with significantly lower impacts than those caused above all by synthetic and artificial fibres or natural fibres such as cotton and wool.

Benefits of silk for the environment: data and evidence

An accurate study based on the comparison between Indian silk production and cultivation (Source: *Central Sericulture Research and Training Institute in Mysore (INDIA), Srikantaswamy and Bindroo*) and Brazilians, (*Silk industry and carbon footprint mitigation - A. M. Giacomin, J. B. Garcia Jr, W. F. Zonatti, M. C. Silva-Santos, M. C. Laktim and J. Baruque-Ramos*) and on consumption data of textile products in the UK market (Source: *WRAP Waste & Resources Action Programme**) calculated and analytically represented how the cultivation of fields in Mulberry trees, for the production of **SILK**, as well as keeping the ecosystem intact and still representing an essential cultural and social element today, is able to mitigate the incidence of CO2 and greenhouse gas production in the atmosphere to the extent of 735 times the weight of the silk fibre produced per cultivated area.

+ 1 kg of SILK product = - 709,57 kg of CO2

+ 1 kg of SILK fibre product = - 732,96 kg of CO2



The agricultural world from which **T.Silk** silk is derived, and which **Cosetex** promotes and protects with its direct and indirect activities, represents a pool of sustainability and ecology as well as the maintenance of unparalleled **biodiversity**.

***WRAP** (**Waste & Resources Action Programme**) is an English non-profit association created in 2000 that specialises in the study and analysis of the sustainable use of resources, in the fight against waste in the study of pollution factors and their reuse both in terms of products and resources. It collaborates with and is funded by DEFRA, the Northern Irish government, the Scottish Zero Waste Department, the Welsh government and the European community. Lately, it has developed collaborations with UNEP (United Nation Environment Programme) and FAO (Food and Agriculture Organisation).*