

	Product Carbon Footprint Report	
	Version 01.1	Date: April 17, 2023
	Comparison of a PLA 96-well plate to a polystyrene 96-well plate	Page 1 of 4

Green Elephant Biotech GmbH

Product Carbon Footprint Report

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	Version 01.1	Date: April 17, 2023
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1 Introduction

This product carbon footprint was calculated using the cradle-to-customer plus end-of-life approach.

Emissions along the following life cycle phases were taken into account:

Extraction and pre-processing of raw materials and packaging, production, delivery of the product to the customer's door, and relevant disposal emissions of the product and packaging. In the "cradle-to-customer plus end-of-life" approach, the focus of the calculation is on those processes that can be controlled by the producer. The emissions from the use phase are mostly not controllable and are subject to assumptions and estimates in the application and are therefore not been taken into account in the calculation. Where possible, primary data was used in the calculation. Where this was not possible, secondary data from recognized sources were used. The emission factors were taken from internationally recognized databases such as ecoinvent or GEMIS. The dataset for PLA raw material was used and the carbon footprint of the raw material was set to 0.03 kg CO₂ instead of 0.12 kg CO₂ to consider the carbon accumulation during plant growth, which was not already factored in.

This is applicable since 100% of the carbon in the biopolymer originates from renewable agricultural resources instead of oil. 3rd party certification based on ASTM6866 is provided in Europe by Vinçotte and in the US by the USDA's BioPreferred program. All relevant greenhouse gases were considered, but CO₂ equivalents were used for better comparability. Emissions that cannot be directly attributed to the product, but are necessary for the production, such as employee travel or business trips were also included in the calculation.

2 Results

The following data and graphics summarize the results of the life cycle analysis.

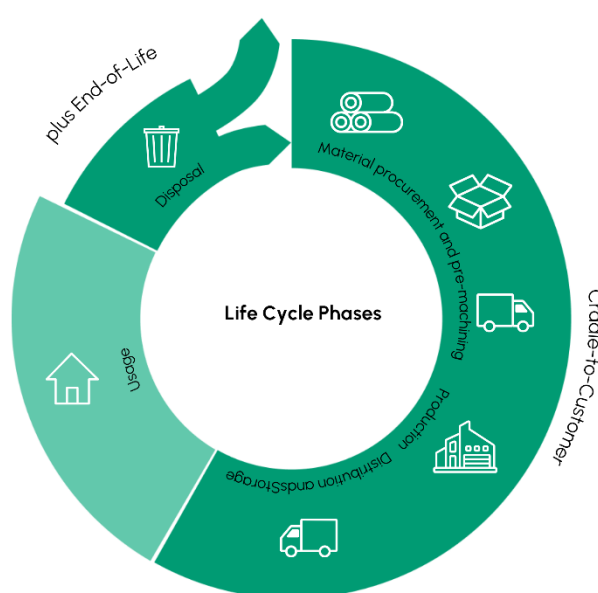


Figure 1: Life cycle phases of a 96-well plate

	Product Carbon Footprint Report	
	Version 01.1	Date: April 17, 2023
	Comparison of a PLA 96-well plate to a polystyrene 96-well plate	Page 3 of 4

Table 1: CO₂ emissions: 96-well plate – Polystyrene and PLA- cradle-to customer plus end-of-life.

Source of Emission	Polystyrene 96-well plate		PLA 96-well plate	
	kg CO ₂	%	kg CO ₂	%
Material procurement and pre-machining	0.21	47.46	0.06	29.06
• Raw material	0.18	40.68	0.03	15.59
• Packaging	0.02	4.52	0.02	8.98
• Inbound logistics	0.01	2.26	0.01	4.49
Production	0.05	11.30	0.05	22.45
• Electricity	0.05	11.30	0.05	22.45
Distribution and Storage	0.01	2.26	0.01	4.49
• Outgoing logistics	0.01	2.26	0.01	4.49
Disposal	0.16	36.72	0.09	39.51
• Incineration	0.16	36.72	0.09	39.51
Not imputable processes	0.01	2.26	0.01	4.49
• Common emissions	0.01	2.26	0.01	4.49
Total Result	0.44	100	0.22	100

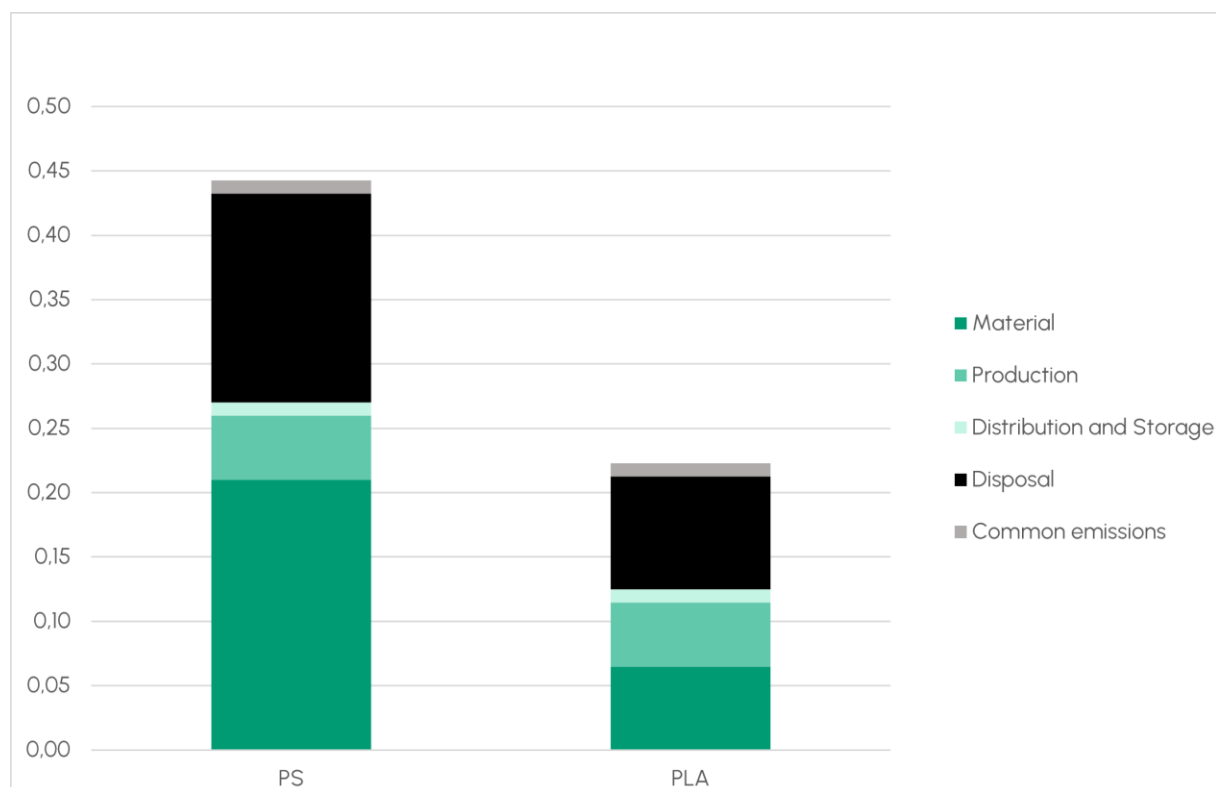


Figure 2: Comparison of the makeup of carbon dioxide emissions for the both 96-well plates

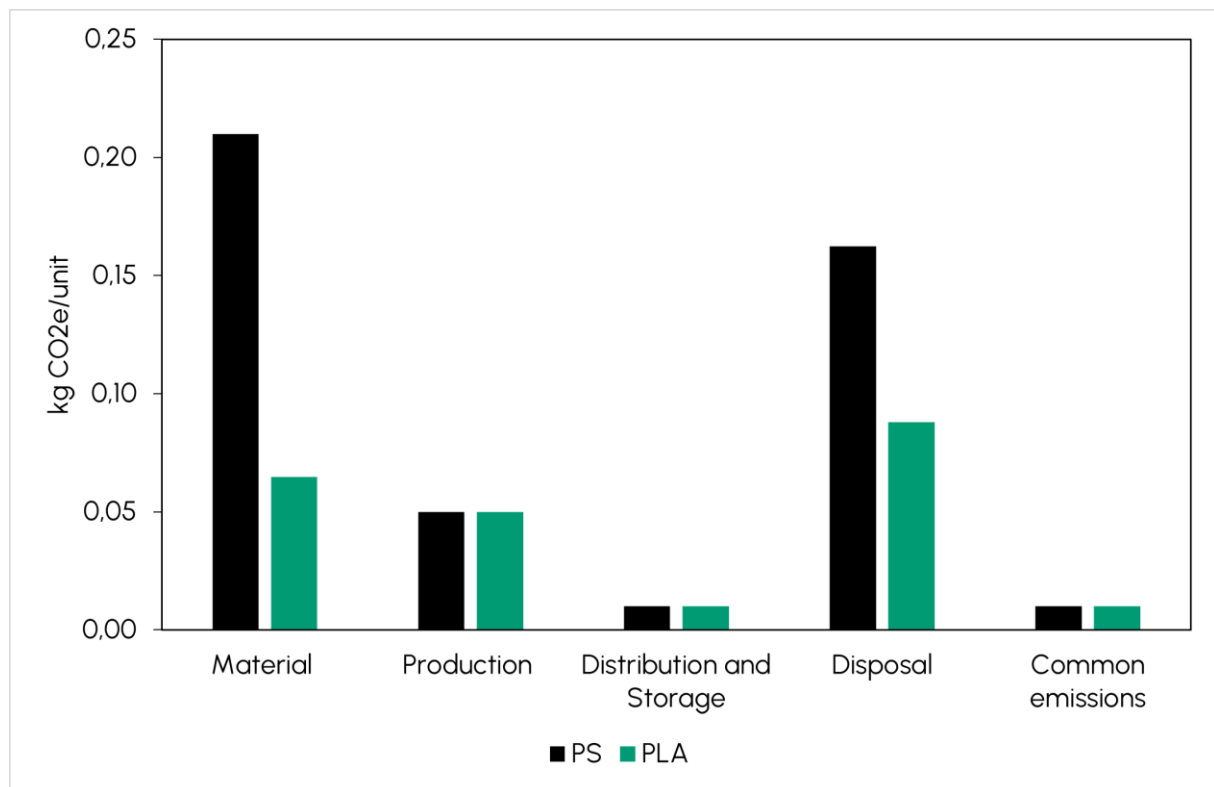


Figure 3: Comparison of the total carbon dioxide emissions for the both 96-well plates