

AMORIM

*Neutrocork Xpür
Carbon Footprint*

Amorim Cork, S.A
Executive summary
September 2022



1

Introduction

About the study

Context

- Corticeira Amorim is the largest world producer of cork products. The company has conducted life cycle analyzes of various products over the years, with the purpose of evaluation of the impacts of the products in terms of carbon, during all stages of its life, from the extraction of natural resources to final waste processing.
- The main purpose of this study was to update, quantify and evaluate the carbon footprint of Neutrocork, one of Corticeira Amorim new-generation technical stoppers, developed from natural cork using cutting-edge technology and composed by uniform-sized micro cork granule composition pressed into individual moulds. The present production process has a different subprocess, a new treatment process called Xpür, that replaced the old Rosa System, which is the single distinction from the previous analysis made to Neutrocork.



Objectives

- Obtain an estimate of the carbon footprint associated to Neutrocork Xpür.
- Understand the contribution of each production phase to the total footprint, in order to identify most relevant areas.
- Identify opportunities to improve the environmental performance of Neutrocork Xpür.
- Enable future measurements and quantifications resulting from changes and improvements.

Neutrocork Xpür

Composition	Standard diameters	Specific weight
<ul style="list-style-type: none">• 81% cork• 18% glue/binder• 1% oil	<ul style="list-style-type: none">• 44 x 24 mm• 38 x 24 mm	<ul style="list-style-type: none">• 240 – 320 kg/m3

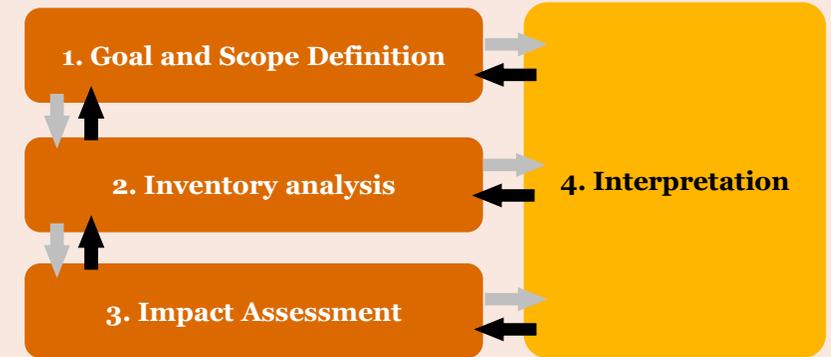
About the study

Methodology

- The carbon footprint presented in this report was developed according to the guidelines of Greenhouse Gas Protocol (GHG), developed by the World Business Council for Sustainable Development and the World Resources Institute.
- The methodology used is life cycle analysis (LCA) based, taking into consideration ISO 14040 series of standards and supported by estimated data from operational units, and also from bibliographic sources, complemented using the Ecobilan LCA database and PwC's specific life cycle analysis software – TEAM ®.
- The results presented are not third-party verified.
- The methodology used in emission accounting is based on emission factors and activity data provided by, using the following equation:

$$GHG\ Emission = Activity\ data \times Emission\ Factor$$

- Cork integrated into product Neurocork stoppers constitutes a carbon sink.
- Emissions from biomass energy production are considered neutral, according to GHG Protocol.
- The additional scenario considering carbon sequestration associated to cork oak forests is based on data from well-managed forest with a high tree coverage and good soil and climate conditions, reaching a maximum of 14,7 t CO₂ /ha, corresponding to 73 t CO₂ /t of cork extracted¹.

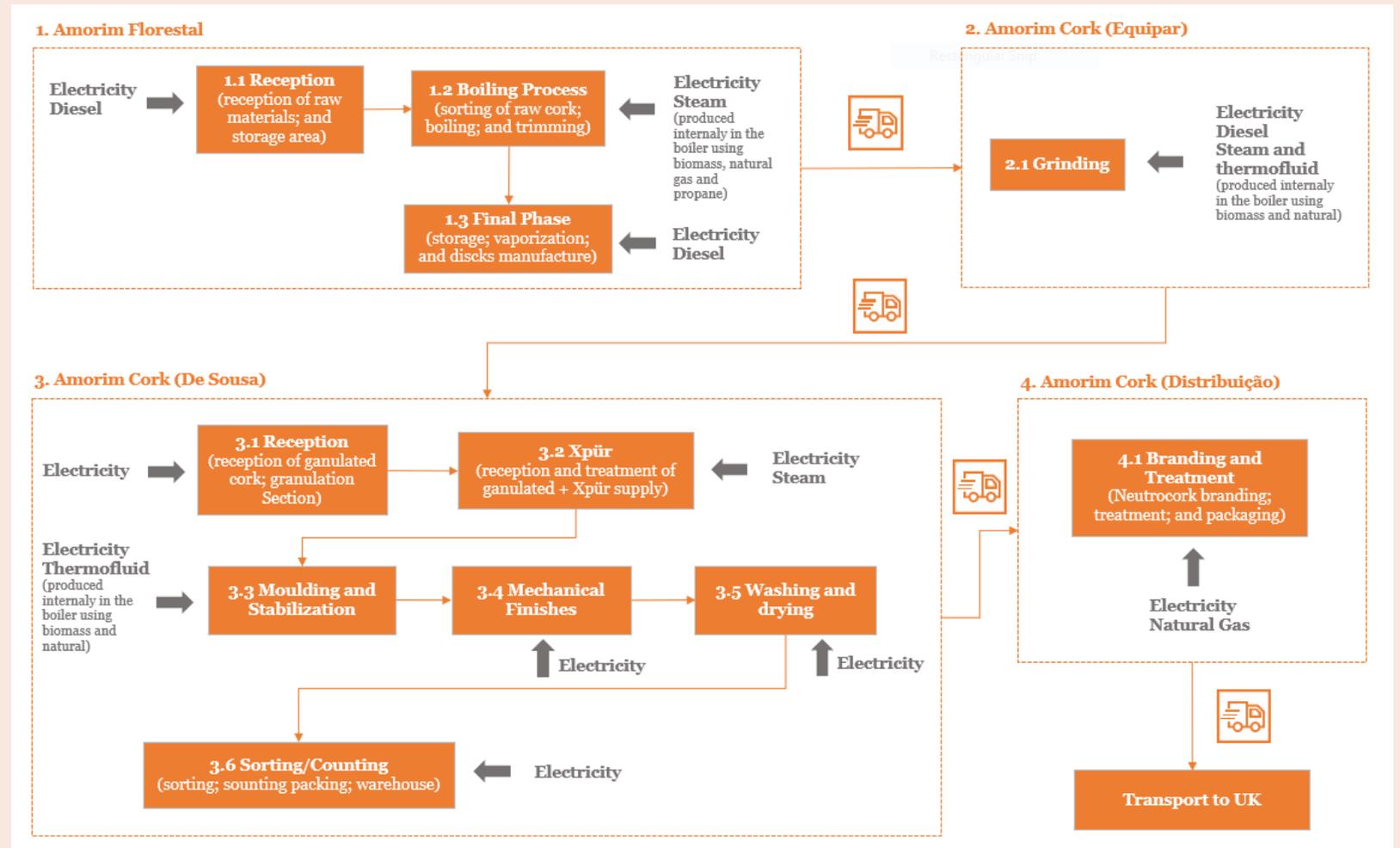


¹ Study led by researcher Ana Claudia Dias from the Department of Environment and Planning and CESAM reveals that the cork industry helps mitigate climate change (available at <http://www.cesam.ua.pt/?menu=1251&language=eng&tabela=post>)

About the study

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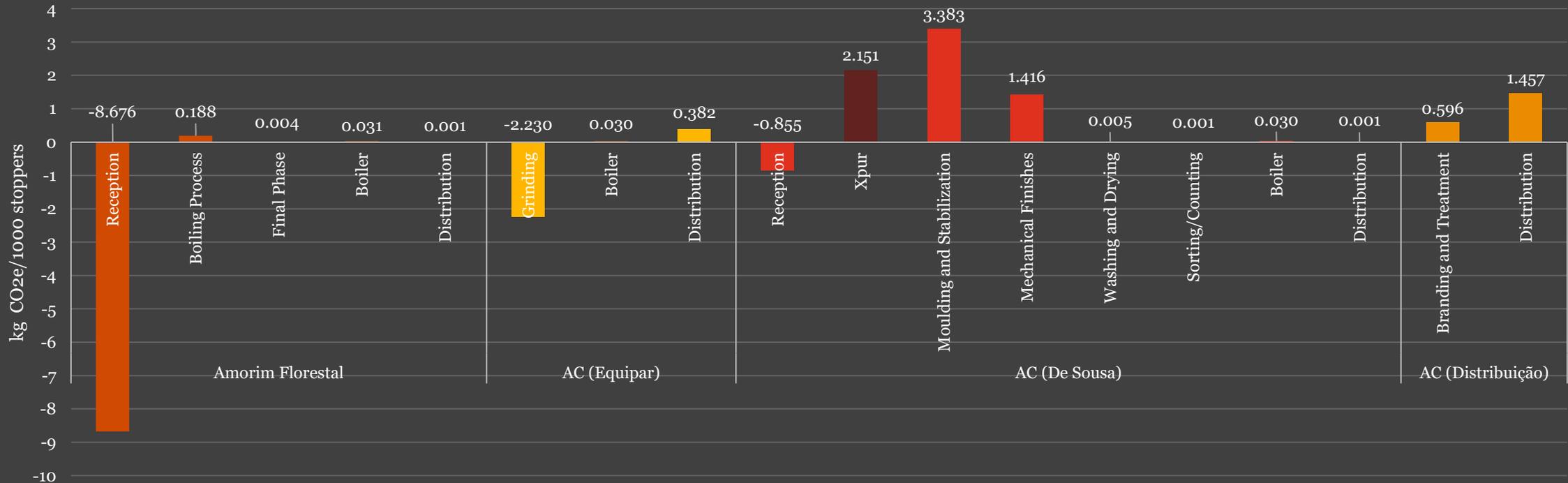
- **Approach:** Cradle-to-Gate (from raw material extraction to the factory gate) and final transport to the UK.
- **Functional Unit:** 1000 stoppers
- **Organizational boundaries:** Amorim Florestal, Amorim Cork (Equipar), Amorim Cork (De Sousa), e Amorim Cork (Distribuição).
- **Operational boundaries:** activities and emissions sources associated to the operation of the four establishments. It is only included the estimated emissions that occurs from sources that are a result of Neutrocork production activities, such as: consumption of raw materials, consumption of energy, and transportation of raw materials, products and subproducts. The impact associated with wastewater treatment and waste produced are not accounted for.



2

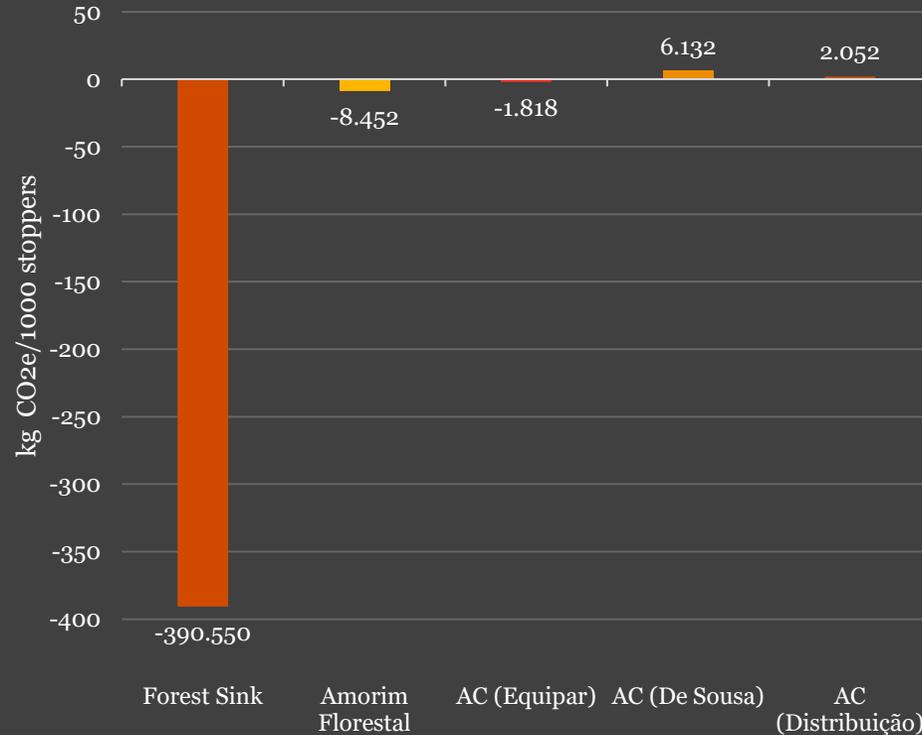
Carbon Footprint

Carbon Footprint Results



Total Cradle-to-gate Xpur: - 3.5 g CO₂ e/stopper
Total Cradle-to-gate + distribution to UK Xpur: - 2.1 g CO₂ e/stopper

Scenario analysis with carbon sequestration in the cork oak montado



Forest storage up to: - 391 kg CO₂ e/1000 stoppers*
Carbon balance (scenario cradle-to-gate + distribution to UK) reaches up to: - 393 kg CO₂ e/1000 stoppers*

* Analysis based on well-managed cork oak montado with a high tree coverage and good soil and climate conditions, reaching a maximum of 14,7 t CO₂/ha, corresponding to 73 t CO₂/t of cork extracted².

² Study led by researcher Ana Claudia Dias from the Department of Environment and Planning and CESAM reveals that the cork industry helps mitigate climate change (available at <http://www.cesam.ua.pt/?menu=1251&language=eng&tabela=post>)

3

Conclusions

Conclusions

- ✓ The most relevant emissions of the Neutrocork Xpür stopper, according to a life cycle approach, in a Business to Business (Cradle-to-Gate) approach (according to scope described), are mainly associated with the processes stages where the consumption of energy and the use of customised products is higher, accounting for 75% of total GHG emissions.
- ✓ Total emissions account for an overall climate change impact of 8,219 g CO₂eq/stopper on a cradle-to-gate approach. Considering the carbon stored in Neutrocork Xpür stopper (11,762 g CO₂e/stopper), the carbon footprint of the product is -3,542 g CO₂e/stoppers, under a cradle-to-gate approach. Total emissions account for an overall climate change impact of 9,676 g CO₂e/stopper on a cradle-to-gate approach plus transport to UK and the carbon footprint of the product is -2,086 g CO₂e/stopper.
- ✓ When considering the additional scenario of carbon sequestration at the oak forest associated to cork production (- 391 kg CO₂e/1000 stoppers), the results are significantly more positive, corresponding to -393 kg CO₂e/1000 stoppers (393 g CO₂e/stopper) on a cradle-to-gate plus transport to UK approach.



Distribution and use of this report

Our report is sent for the attention of Corticeira Amorim within the context of the agreement of 11th October 2021. Corticeira Amorim has informed us of its intention to circulate this report to a wide audience. We do not accept any responsibility vis-a-vis any third party to whom the report has been shown or disclosed to in any form, the use of the report by them being their sole responsibility.

We would remind you that this survey is based solely on the facts, circumstances and hypotheses submitted to us and which are specified in the report. If these facts, circumstances or hypotheses differ, our conclusions are liable to change.

In addition, the results of the survey should be considered in their entirety in respect of the hypotheses, and not taken in isolation.