

A stylized green plant graphic with a main stem on the left and a branch extending to the right. The stem has several leaves, and the branch has one large leaf. The plant is rendered in a solid green color with white outlines for the veins and stems.

**ENVIRONMENTAL ACHIEVEMENTS
IN THE PAPER SACK
AND KRAFT PAPER INDUSTRY:
BUILDING SUSTAINABILITY**

INTRODUCTION

A long term **partnership** links the forest to the paper sack industry. Indeed, the **forest plays a major part in our business**, continuously providing natural fibre while absorbing CO₂ for its own growth.

The renewability of our raw material and the recycling of paper, make the paper sack industry **naturally eco-friendly**.

For **15 YEARS**, the Kraft paper and paper sack industry has documented its environmental impact, running various Life Cycle Studies.

This document, based on a **study** run by the **Swedish Research Institute, Inventa**, aims at giving simple answers to fundamental questions: What is our environmental impact? How has our industry reduced its emissions? What are the technical solutions that have enabled this progress? What is our **CARBON FOOTPRINT**? and How do we measure it?



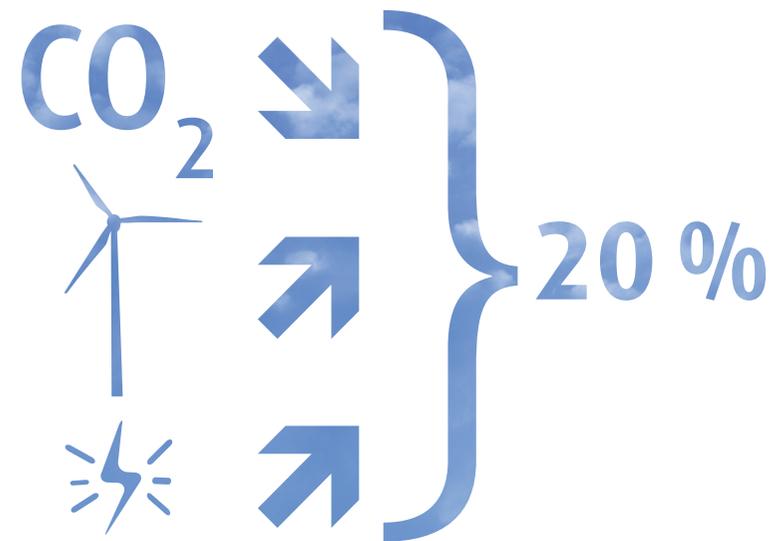
EUROPEAN COMMISSION

THE « CLIMATE ACTION PLAN »

In 2008, the European Commission has voted the « **Climate Action Plan** » in order to reduce Europe's overall emissions by at least 20% by 2020.

The « **20-20-20 ACTION PLAN** » consists of:

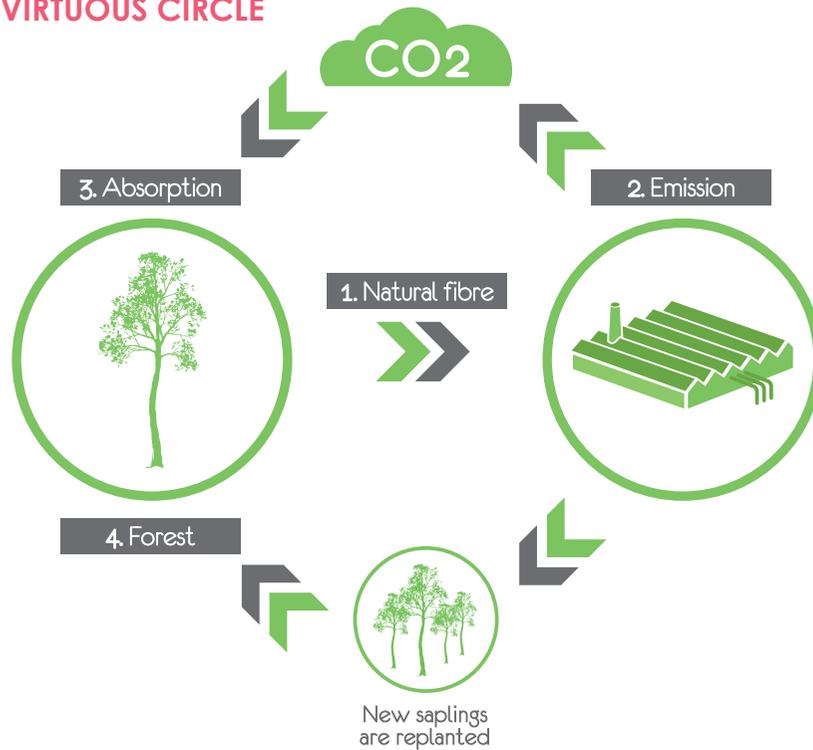
- Cutting greenhouse gas emission by **20%**
- Using **20 %** of renewable energy
- Improving energy efficiency by **20%**



The paper sack and Kraft paper industry is a part of the solution to this global change, largely using biomass fuels and renewable materials.

INDUSTRY AND NATURE, TWO WORLDS NATURALLY LINKED

A VIRTUOUS CIRCLE



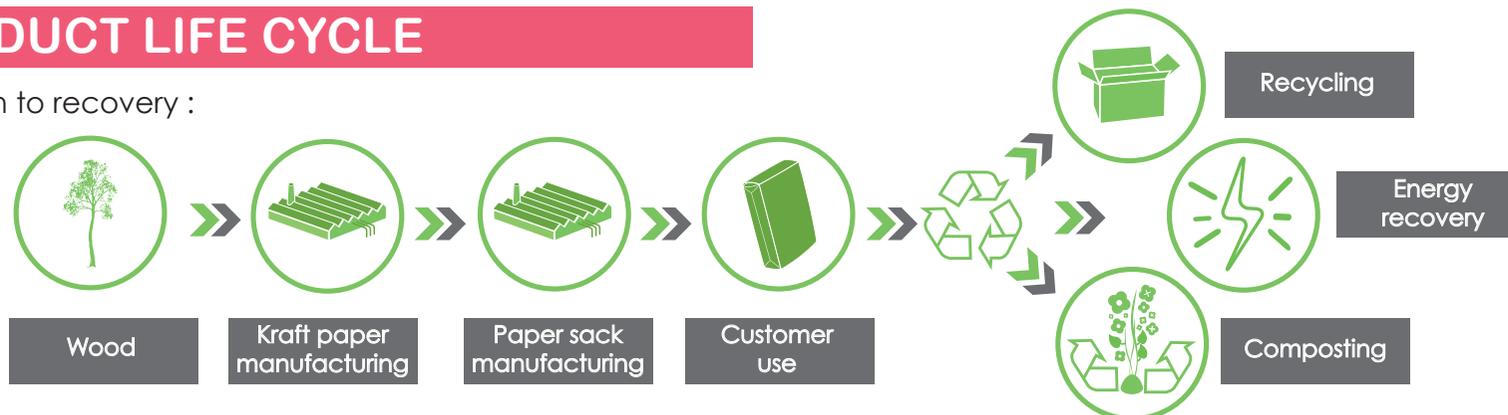
The forest plays a major part in the process, and our industry contributes to its sustainability.

1. Our industry uses **natural fibre**, from tree thinning and from process waste of the timber industry. **The forest is a natural and renewable resource.**
2. The Kraft paper and paper sack industry emits CO₂.
3. **Forests absorb CO₂** during their growth in the photosynthesis process. The trees in a forest can trap large amounts of CO₂ and store it.
1 m³ of wood captures 1 t of CO₂ while emitting 0.7 t of O₂.
4. Thanks to sustainable forestry management, the paper sack industry has a **positive land use.**

➤ In **sustainably managed forests**, new trees are continuously replanted. Today the **wood surface** in Europe is expanding by **510 000 ha** per year.

THE PRODUCT LIFE CYCLE

From production to recovery :



IMPROVEMENTS IN FIGURES

THE KRAFT PAPER & PAPER SACK INDUSTRY

A PIONEER IN LIFE CYCLE INVENTORY STUDIES

For 15 years our industry has run studies to measure its environmental impact, providing the basis for continuous improvement.

RECENT IMPROVEMENTS HAVE BEEN MADE IN 4 MAIN CATEGORIES:

- REDUCTION in **purchased electricity**
- REDUCTION in **greenhouse gas emissions**
- OPTIMISATION of **material use**
- REDUCTION in **fossil fuel consumption**

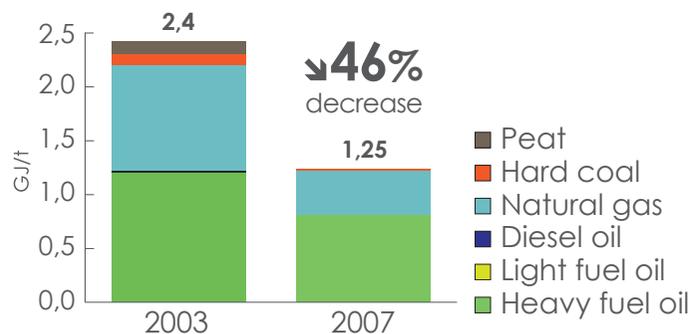
Today more than 50% of the total energy consumption of the European pulp and paper industry comes from biomass fuels which are CO₂ neutral.



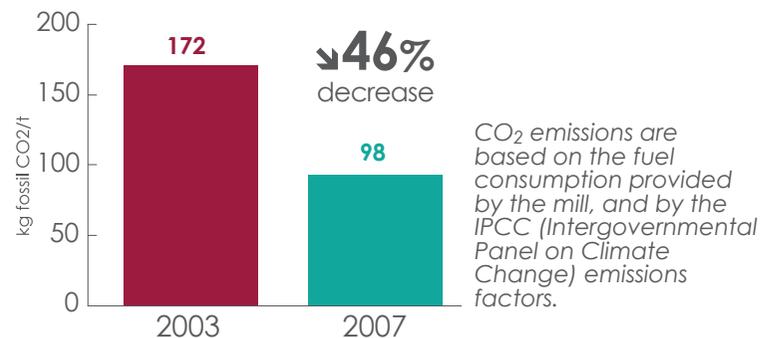
KRAFT PAPER

11 Kraft paper mills have contributed to the study, giving a good European average. The results are gate-to-gate, thus analysing the production process itself. Between 2003 and 2007, the Kraft paper industry has reduced by 46 % its fossil fuel consumption, by 46 % its fossil CO₂ emission and by 36 % its purchased electricity.

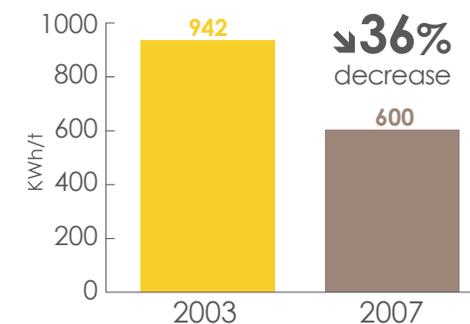
Fossil fuel consumption [GJ/t]



Fossil CO₂ [kg CO₂/t]



Purchased electricity [kWh/t]



IMPROVEMENTS IN FIGURES



- network water
- fuels
- chemicals
- other sack components



TECHNICAL EVOLUTION TOWARDS A GREENER PROCESS

For decades, Research and Development has made **huge progress**, constantly improving **paper resistance**, elasticity and porosity.

The average weight of a paper sack is now 130 gr, **25 % less than 15 years ago**.

10 years ago 3 sheets of Kraft paper were required to produce a standard paper sack, now there are only **2 sheets or even 1 sheet**.

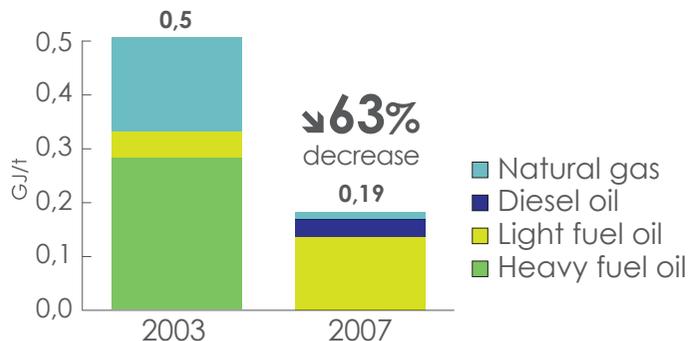
All of the **inks** used are **water based** and most of the **glues** are **starch based**.

Modern sack manufacturing technology allows the **optimisation of the components used**.

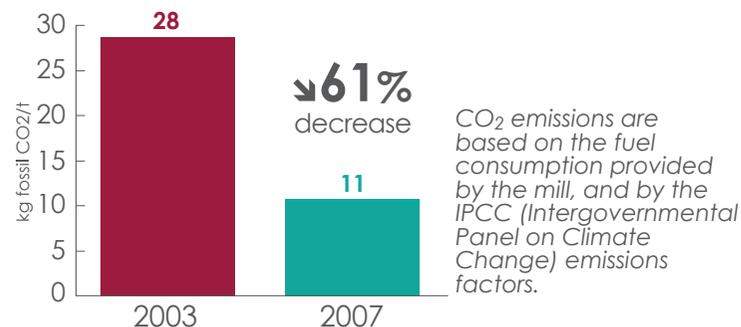
PAPER SACK

12 paper sack plants have contributed to the study, giving a good European average. The results are gate-to-gate, thus analysing the production process itself. Between 2003 and 2007, the paper sack industry has reduced by 63 % its fossil fuel consumption, by 61 % its fossil CO₂ emission and by 20 % its purchased electricity.

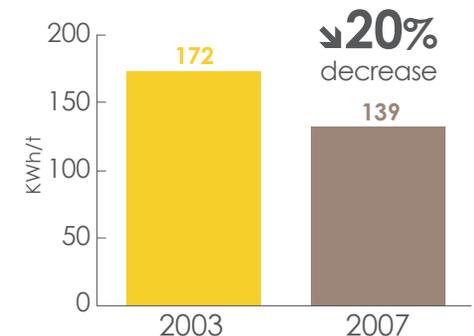
Fossil fuel consumption [GJ/t]



Fossil CO₂ [kg CO₂/t]



Purchased electricity [kWh/t]



WHAT IS A « CARBON FOOTPRINT » ?

« **CARBON FOOTPRINT** » is the measure of the impact of a product or service on the climate.

The expression relates to carbon dioxide which is the most common greenhouse gas and a contributor to global warming.

The unit of measure is kg of CO₂.

When another gas is concerned such as methane, it is converted in CO₂ - eq (eq = equivalent).



HOW TO CALCULATE THE CARBON FOOTPRINT ?

CEPI (Confederation of European Paper Industry) and CITPA (International Confederation of Paper and Board Converters in Europe) have developed a sector wide carbon footprint framework forming the basis for companies to report their carbon footprint.

10 toes are theoretically considered, 5 of them have been specifically analysed here:

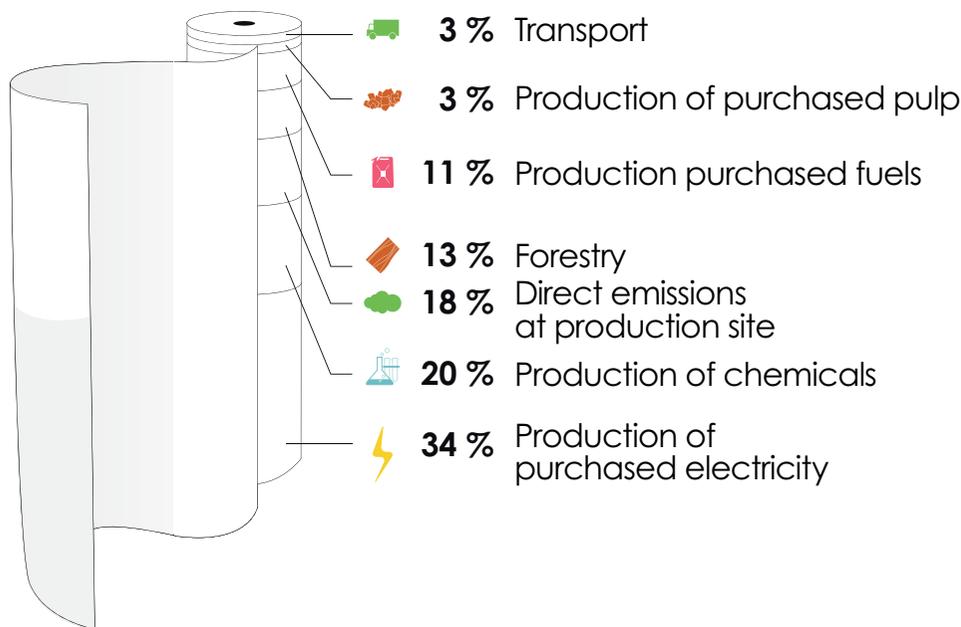
- ① Carbon sequestration in forests.
- ② Carbon stored in forest products.
- ③ **Greenhouse gas emissions from forest product manufacturing facilities.**
- ④ **Greenhouse gas emissions associated with producing fibre.**
- ⑤ **Greenhouse gas emissions associated with producing other raw materials/fuels.**
- ⑥ **Greenhouse gas emissions associated with purchased electricity, steam, heat, hot and cold water.**
- ⑦ **Transport-related greenhouse gas emissions.**
- ⑧ Emissions associated with product use.
- ⑨ Emissions associated with product end-of-life.
- ⑩ Avoided emissions and offsets.

CARBON FOOTPRINT FOR KRAFT PAPER

The total amount of fossil CO₂-eq during the production of 1000 kg of European average Kraft paper (composition: 80% unbleached, 20% bleached Kraft paper) is **519 kg CO₂-eq/t**.

The carbon footprint for Kraft paper takes into consideration cradle-to-gate factors: from wood to Kraft paper production.

Sources of emissions in the carbon footprint for European average Kraft paper:

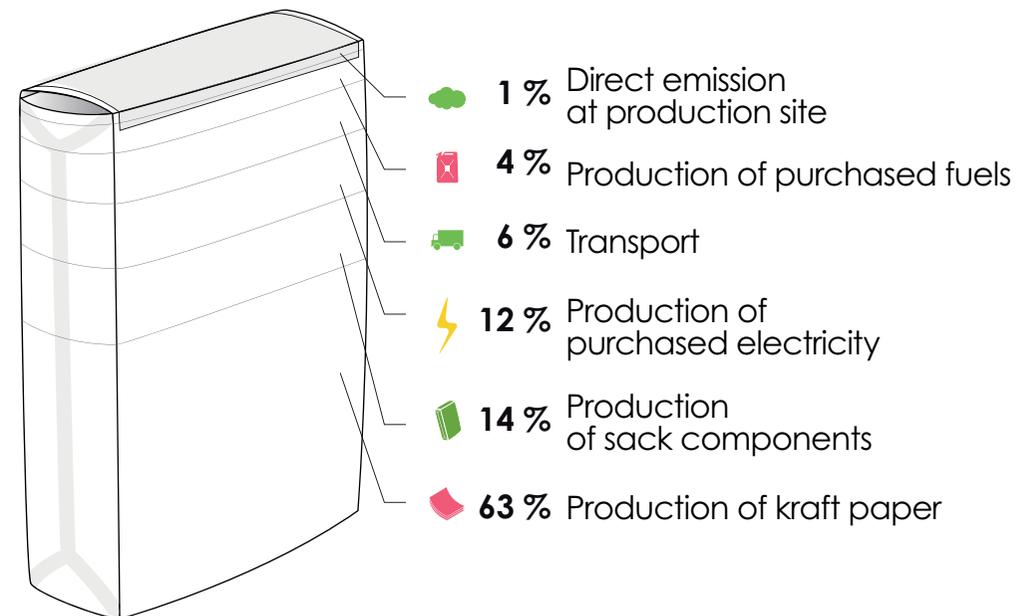


CARBON FOOTPRINT FOR PAPER SACK

The total amount of fossil CO₂-eq during the production of 1000 kg of European average paper sack (composition of the Kraft paper used in the paper sacks: 77% unbleached, 23% bleached) is **800 kg CO₂-eq/t** (or **114 gr/sack**).

The carbon footprint for paper sacks takes into consideration cradle-to-gate factors: from wood to paper sack production.

Sources of emissions in the carbon footprint for European average paper sack:



THESE FIGURES DO NOT TAKE INTO ACCOUNT THE **CARBON SEQUESTERED** BY TREES.
However, it is a well-known fact that sustainably managed forests act as a carbon sink.

The paper sack industry, naturally sustainable



You can download the full LCI Study on the Eurosac
and CEPI Eurokraft websites.



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