

Fact Sheet

Significant improvement of environmental footprint of paper sacks

Introduction

Climate change is a topic of high public interest. Stakeholders are increasingly looking at standards, labels and other instruments that broaden the focus beyond emissions related to production activities to encompass the entire value chain. In this context, the fossil carbon footprint that is associated with the whole supply chain – including the manufacture, transport and distribution of a certain product or packaging – is an established tool that gives customers an indication about a product's impact on the climate. CEPI Eurokraft and EUROSAC are pleased to present the carbon footprint for sack kraft paper and paper sacks in Europe for 2018. The report also contains an extended analysis method which also includes biogenic removals and emissions in the calculation. This even gives a more complete and realistic picture of the environmental friendliness of paper sacks.

About the research

The analysis has been carried out by the Swedish research institute RISE using two different methods. Both calculations are based on tools developed by the International Confederation of Paper and Board Converters in Europe (CITPA) and by the Confederation of European Paper Industries (CEPI).

- As the first step, a cradle-to-gate calculation of the fossil carbon impact of sack kraft paper and paper sacks was conducted following the CEPI¹ and CITPA² guidelines established in 2007.
- In the second step, the study included the total carbon impact (i.e. fossil carbon emissions, biogenic carbon emissions and biogenic carbon removals).

Data sources

The calculations make use of the gate-to-gate life cycle inventory data covering sack kraft paper production and paper sack converting compiled by CEPI Eurokraft and EUROSAC for 2018 from representative European mills and converting facilities. Fossil greenhouse gas (GHG) emissions factors for electricity are sourced from the International Energy Agency (IEA) Emissions Factors 2019. Carbon factors for emissions and removals have been sourced from the recognised life cycle inventory databases ecoinvent, GaBi professional, and the European reference Life Cycle Database (ELCD).

¹ CEPI, *Framework for the Development of Carbon Footprints for Paper and Board Products*, September 2007

² CITPA, Beaufort-Langeveld, A. d., *Guidelines for calculating CO₂ footprints for paper-based packaging*, 2007

Paper sacks specification

Paper sacks are manufactured from sack kraft paper combined with other components to deliver an effective, lightweight, and functional package. The sack kraft paper is made from virgin fibres. The paper sack composition considered in this analysis is summarised in the table below:

Component	Share of composition by weight	
Paper	92.7%	117.2 g
Film (HDPE/LDPE)	4.0%	5.0 g
Glue (starch and PVA glues)	2.0%	2.6 g
Ink	1.1%	1.4 g
Other components	0.2%	0.2 g
Total	100%	126.4 g

CARBON FOOTPRINT RESULTS

There is a consistent downward trend in the cradle-to-gate fossil carbon impact of average European sack kraft paper and paper sacks.

For the production of sack kraft paper

- 2015 to 2018: The reduction in fossil carbon impact per tonne of sack kraft paper was approximately 0.5% – from 458 kg CO₂e to 455 kg CO₂e.
- 2007 to 2018: There is a significant reduction in fossil carbon impact per tonne of sack kraft paper of approximately 20% – from 570 kg CO₂e to 455 kg CO₂e.



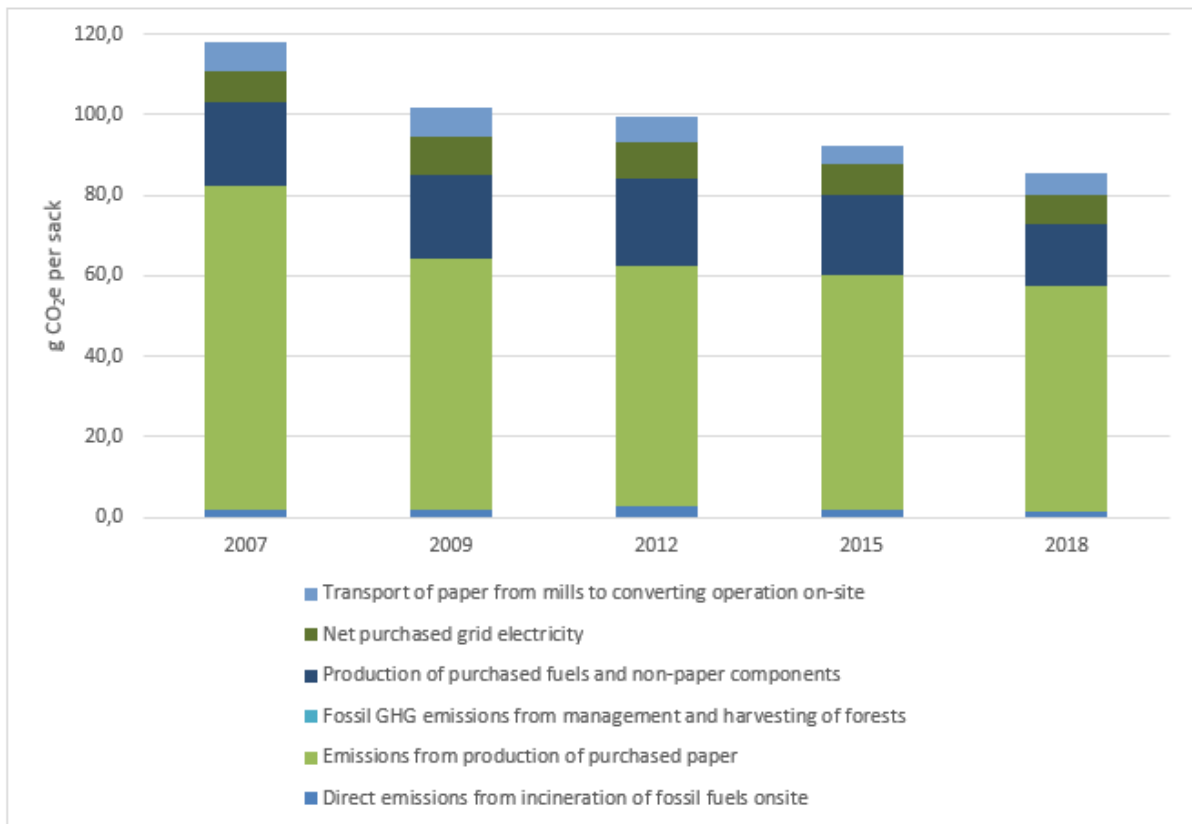
Performance powered by nature.

For the production of paper sacks

- 2015 to 2018: The fossil carbon impact per paper sack is reduced by 8% – from 92 g CO₂e to 85 g CO₂e per sack in 2018. The emissions are as follows:

Description	Fossil GHG emissions	Percentage
Production of purchased kraft paper	56 g CO ₂ e	66%
Production of purchased fuels and non-paper inputs	15 g CO ₂ e	18%
Production of purchased electricity	7 g CO ₂ e	8%
Transport to converting operation	5 g CO ₂ e	6%
Direct emissions from production site	2 g CO ₂ e	2%
	85 g CO₂e	100%

- 2007 to 2018: The fossil carbon impact per paper sack has been reduced by 28% – from 118 g CO₂e to 85 g CO₂e. The figure below shows the improvement since 2007:





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Extending the system boundaries

Forests sequester and store carbon. When including the cradle-to-gate biogenic removals as well as emissions in the 2018 calculation, the carbon footprint even comes to a negative result – which has a positive impact on the climate:

- The cradle-to-gate biogenic removals (associated with forest management, production of biofuels and production of bio-based non-fibre inputs such as starch) are –447 g CO₂e per paper sack.
- The cradle-to-gate biogenic emissions (associated with combustion of biofuels) are 327 g CO₂e per paper sack.
- In total, this gives a net biogenic carbon result of –120 g CO₂e per paper sack.
- Combining the cradle-to-gate fossil carbon footprint result (85 g CO₂e per sack) with the cradle-to-gate biogenic carbon footprint result (–120 g CO₂e per sack) totals –35 g CO₂e per paper sack.

ENERGY CONSUMPTION

The production of sack kraft paper is very energy-efficient and uses a high degree of renewable energy sources:

- 77% of all energy needs (heat and electricity) is generated on-site.
- 89% of the fuels are renewable and used to generate heat, steam and electricity.
 - 81% are produced as side streams of the pulp and papermaking process.
 - The remaining 8% are purchased.
- Purchased fossil fuels make up only 11%.

CEPI Eurokraft is the European Association for Producers of Sack Kraft Paper for the Paper Sack Industry and Kraft Paper for the Packaging Industry. It has eleven member companies representing a volume of 3.0 million tonnes of paper produced in twelve countries. www.cepi-eurokraft.org

EUROSAC is the European Federation of Multiwall Paper Sack Manufacturers. The federation represents over 75% of European paper sack manufacturers. Its members operate in 20 different countries. They produce more than 5 billion paper sacks per year, representing 650,000 tonnes of paper converted in 60 plants. Sack manufacturers from all continents and bag manufacturers also contribute to the federation as corresponding members, and more than 20 suppliers (paper, film, machine or glue manufacturers) are registered as associate members. www.eurosac.org