

Environmental Product Declaration



In accordance with ISO 14025 for:

- 1. recycled paper for corrugators - greenpaper®**
- 2. recycled paper for corrugators – “other papers”**



CARTESAR SPA
Pellezzano (SA)
ITALY



Programme:

Programme operator:

EPD registration
number:

CPC CODES

Publication date:

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Revision date

The International EPD® System, www.environdec.com

EPD International AB

S-P- 01621

32134 - 32135

2020-02-03

2024-07-17

2022-02-14

Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
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Product category rules (PCR): <i>CORRUGATED PAPER AND PAPERBOARD PRODUCT GROUP: UN CPC 32151 2013:07 VERSION 2.11 VALID UNTIL: 2021-08-11,</i>
PCR review was conducted by: Review Chair: Filippo Sessa – contact: info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: <i><name, organisation and signature of the third party verifier></i> <i>In case of accredited certification bodies:</i> Accredited by: <i><name of the accreditation body and accreditation number, where applicable>.</i> <i>In case of recognised individual verifiers: Ing. Vito D'Incognito – Take care International</i> Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

Differences versus previous versions

Compared to the first Cartesar LCA and EPD S-P- 01621 published 2020-02-03, main differences concern the following points:

1. Elaboration of the environmental impact data through the updated version of Simapro Software v. 9.1.1.1 and the use of Ecoinvent v. 3.6 database instead of Ecoinvent v. 3.2
2. Greater detail in the description and measurement of the main input / output flows and the mass balance
3. A DQR (data quality review) was carried out to evaluate more specifically the quality of primary and secondary data considered.
4. Thermal energy generated by the CHP cogeneration plant installed at Cartesar was quantified and taken in account. A better and more complete allocation of the natural gas used was therefore carried out, also respect to the electricity generated and used in the plant and the quota sold to the national grid.
5. A more appropriate ecoinvent dataset was identified and associated to the impacts deriving from energy cogeneration; The model defined included the NOx and CO emissions into the air detected and measured by the company. The quantities associated with these emissions had already been taken into account in the dataset of natural gas combustion in the cogeneration process. Therefore, the emissions data detected and measured by the company were excluded to avoid double counting.
6. Sensitivity analysis on energy dataset, use of auxiliaries and transports were carried out
7. The standard deviance of data was measured through a Montecarlo analysis

Company information

The history of the company has its roots in the Amalfi Coast where the De Iuliis family still manages the Antica Cartiera Amalfitana, an industrial jewel from the 1700s that still produces handmade paper.

Established in 1974, Cartesar started its activity in the Pellezzano plant and the challenge of innovation continues through research: thus begins the production of recycled paper for corrugators using only waste paper as raw material.

More than 40 years have passed since then and the company's growth has never stopped. A central element in the company philosophy is the great attention to sustainable development: the goal is to make the entire production process more and more efficient and sustainable through constant investments, already in place and planned for the future, which have as their ultimate goal the intelligent use of resources and the supply of increasingly performing products.

Product-related or management system-related certifications:

Cartesar produces paper by adding value to paper to be recycled compliant with the UNI EN 643: 2014 standards which has ceased the qualification as waste (End of waste) pursuant to Ministerial Decree 188 of 22/09/2020.

Certifications are a valid tool for the company to demonstrate its abilities not only in respecting the laws but also in making the most of the organization's commitment and constant attention to quality and respect of environment and people.



Name and location of production site: CARTESAR SPA – Via Carlo De Iuliis – Pellezzano (SA) Italy

Product information

Cartesar produces in a continuous cycle recycled paper for corrugators, using mostly post-consumer paper to be recycled collected from central-southern Italy: an internal laboratory checks the incoming quality and also the compliance of the finished product with the GIFCO specifications, before shipping to customers. The catalog includes over 10 types of papers with weights ranging from 90 to 180 g / m² and the production capacity is over 140,000 tons / year.

The company is equipped with a CHP system that allows (fully covering production needs and releasing the surplus to the network) the autonomous production of electricity through a gas turbine powered by methane with recovery of the residual heat in the steam generator.

This EPD analyzes the environmental impacts related to the manufacturing of two different types of products that are distinguished mainly by the origin of the raw material (paper to be recycled) and by the distribution scenario:

1) *Other Papers*: recycled, wave / cover, with weights from 90 to 180g/sqm

2) *Greenpaper®*: recycled corrugated paper and cover for corrugators with weights from 90 to 160 g/sqm and technical name "greeneffe" - "greenpaper® light" - "greenpaper® standard"

These products represent the totality of Cartesar production (97,85% Other Papers, 2,15% greenpaper®): in particular, the study aims to highlight the positive impacts of the production of recycled papers (Other papers) and the additional benefits deriving from proximity recycling that characterize the greenpaper® line that uses only local paper to be recycled with a distribution of the finished product to the 3 main corrugators in Campania.

Cartesar intends to use the EPD to gain greater awareness of the critical impacts of its supply chain, improve its processes and communicate what has been achieved by deepening its commitment to the issues of economic, social and environmental sustainability

 ONDA	 COPERTINA	 CARTE SPECIALI
Onda Light	Copertina Light	Well Liner Tropic
Onda Medium	Copertina Test	
Onda Wellenstoff	Copertina Liner	
Onda Well Tropic	Copertina Liner Tropic	
Onda Tirreno XP	Copertina Kraft Italiano	

Description of system boundaries:

Boundaries of the considered system are of the "cradle to customer's gate" type (from the cradle to the customer's gate).

The system includes the phase of delivery of *greenpaper* reels to the main corrugators in Campania (average distance 45,7 km) and of the reels of *other papers* to customers located within a radius of 250 km.

Potential benefits from energy recovery or recycling of materials/waste were not included in the study.

In addition, no carbon storage credit was awarded. This approach was chosen because most of the impacts (as confirmed by other studies available to the public) are in the production phases and the company's goal is to analyze these phases in detail to understand the different environmental impacts.

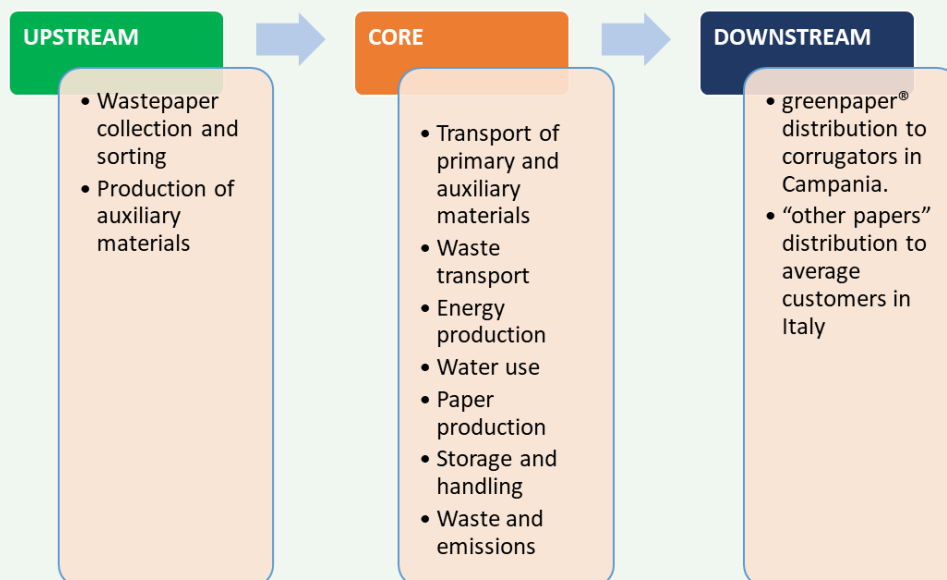
Phases considered within the system boundaries of this study were then grouped into three modules according to the indications of the reference PCR:

Upstream: collection and selection of paper to be recycled, auxiliaries production.

Core: transports, water and energy consumption, paper reels production, waste and emissions.

Downstream: distribution to customers

The following figure shows the scheme of the system boundaries:



Manufacturing process

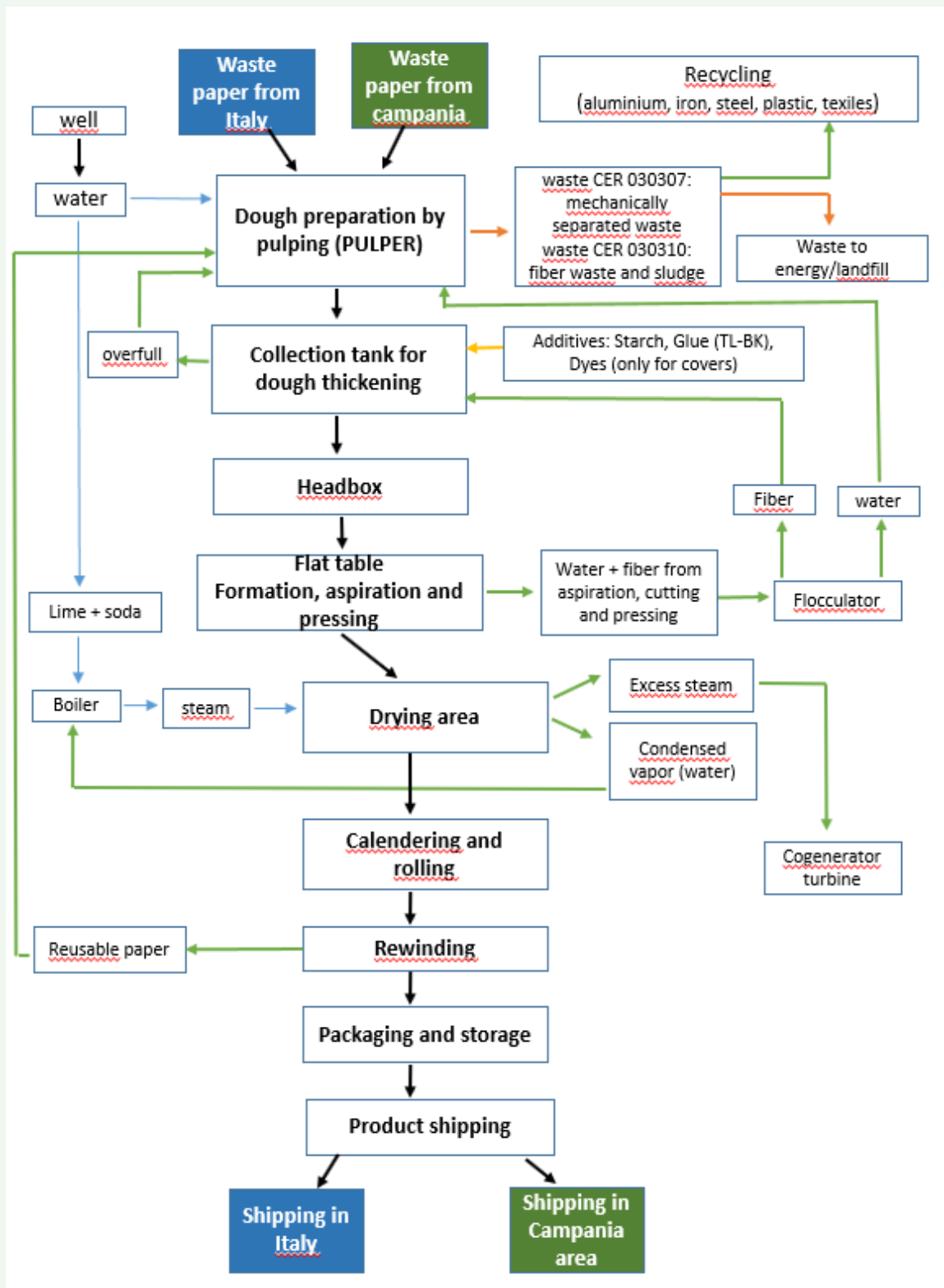
Apart from the origin and nature of the papers used, both products (1 & 2) are made according to the following production cycle:

Cartesar receives paper to be recycled (compliant with the UNI EN 643 standards as an "End of waste" pursuant to Ministerial Decree 188 of 22/09/2020) from over 30 Italian locations, for a total of about 116.000 tons / year: between them, 37% comes from Campania. Paper to be recycled is delivered to the paper mill inside through containers supplied by Cartesar itself or from other platforms that provide material already selected and packaged. In the latter case, even before being unloaded from the truck, the bales are sampled by means of a probe to verify the degree of humidity and the percentage of non-paper materials and then classified according to the quality of their composition.

The paper mill is located in Pellezzano (SA) in the Coperchia area.

The production process is divided into the following phases:

- Dough preparation
- Sheet formation
- Drying
- Rolling
- Rewinding
- Storage
- Shipment



Bales of waste-paper are stored in dedicated areas and moved by forklifts to the first stage of processing "Dough preparation" where, with the addition of water in the "Pulper", the process of pulping takes place filtering fibers and rejecting foreign elements (plastic, metals, sand, fabric), which are sent for disposal or energy recovery.

The mixture thus obtained is then treated to achieve the characteristics required by customers in terms of mechanical strength and appearance of the sheet.

The entire process of the production of recycled paper can be considered as a progressive de-humidification of the product: in fact, in the next stage "Forming and pressing", vacuum pumps aspire from the bottom water and fiber from the composition on the belt while a felt press from above. The water and fiber thus extracted end up in a "collection vat" which, due to overflow, recovers water and fibers re-sending them to the "Pulper", while the rest is sent to another tank where, by flocculation using aluminum polychloride, fibers are recovered and added to the thickening phase.

The process continues in the "drying room" where by means of the steam produced by a cogenerator at a pressure of 16 bar, the sheet of paper is almost completely dehydrated through drying cylinders. The steam condensate is recovered and returns to the boiler.

The tape is then rolled onto a cylindrical metal core until it reaches the size of a reel weighing about 10 tons. This is then "rewound" in 3 reels of about 3 tons each, standard weight for deliveries to customers.

The reels thus formed are closed with straps (one at the base and one at the top), labeled and sent to the warehouse for shipping.

All products marketed by the Company are subjected to quality controls to verify their compliance with CEPI / GIFCO specifications and the Customer's specifications.

LCA information

Functional unit: 1 ton of paper

Reference service life: N/A

Time representativeness: 2019

Database(s) and LCA software used: Ecoinvent 3.6 – SimaPro 9.1.1.1

Owner of the EPD:

Cartesar spa – Pellezzano (SA) Italy

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Product 1

“other papers”:

Product identification: Cartesar “other papers” are recycled papers for corrugators made mostly with post-consumer paper at the Cartesar plant in Pellezzano (SA).

Cartesar “other papers” are divided into 3 main categories, weighting from 90 to 180 g/sqm: fluting papers, liner papers for covers, special papers. Special papers include the “liner tropic” a special grade (fluting and linerboard) with a particular resistance to humidity, and the special grade of paper PLG01

Product description: Corrugator papers are shipped in reels and constitute a semi-finished product for the production of corrugated cardboard sheets and packaging. The specific function of corrugated containers is that of secondary packaging (distribution packaging)

and therefore the protection of the products contained therein in order to ensure their transport, handling and storage in complete safety and safeguarding their integrity.

Declaration about the recording, the evaluation, the authorization and the restriction of chemical substances – REACH - Rule (EC) n° 1907/2006 of the European parliament: Cartesar papers don't contain substances subject to recording and therefore, as required by the rule it will be Cartesar care to ask its suppliers, in the chain of provisioning, the full observance of every fulfillment regarding the pre-recording, recording, authorization, predisposition of the scenery of exposure and the safety files, as foreseen by the arts. 6,31,95 of the summencioned rules.

UN CPC code: 32134 - 32135

Geographical scope: Europe



Product 2

“greenpaper®”

Product identification: greenpaper® is 100% made recycling mostly post consumer paper.

Cartesar “greenpaper” are divided into 3 main categories, weighting from 90 to 160 g/sqm: fluting papers, liner papers, special papers. Special papers include the “liner tropic” a special grade (fluting and linerboard) with a particular resistance to humidity.

greenpaper® is manufactured at Cartesar Spa, a paper mill in Pellezzano (SA) which receives about 116.000 tons of paper to be recycled yearly, 37% of which comes from Campania region and the rest from other areas of the Country. The Greenpaper line uses paper to be recycled from Campania and neighboring areas that do not have recycling plants, thus being able, to all intents and purposes, to define paper recycling at Cartesar as “proximity”, pursuant to Directive 2008/98 / EC.

Product description: Corrugator papers are shipped in reels and constitute a semi-finished product for the production of corrugated cardboard sheets and packaging. The specific function of corrugated containers is that of secondary packaging (distribution packaging) and therefore the protection of the products contained therein in order to ensure their transport, handling and storage in complete safety and safeguarding their integrity.

Declaration about the recording, the evaluation, the authorization and the restriction of chemical substances – REACH - Rule (EC) n° 1907/2006 of the European parliament: Cartesar papers don't contain substances subject to recording and therefore, as required by the rule it will be Cartesar care to ask its suppliers, in the chain of provisioning, the full observance of every fulfillment regarding the pre-recording, recording, authorization, predisposition of the scenery of exposure and the safety files, as foreseen by the arts. 6,31,95 of the summentioned rules

UN CPC code: 32134-32135

Geographical scope: Europe

Green Paper®



Environmental performance product 1: “other papers”

Potential environmental impact

PARAMETER		UNITx ton	Upstream	Core	Downstream	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	1,39E+02	2,74E+02	5,32E+01	4,66E+02
	Biogenic	kg CO ₂ eq.	7,19E+00	2,05E+00	1,82E-02	9,26E+00
	Land use and land transformation	kg CO ₂ eq.	1,64E+00	2,98E-02	2,34E-02	1,70E+00
	TOTAL	kg CO₂ eq.	1,47E+02	2,76E+02	5,33E+01	4,77E+02
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	9,64E-04	5,11E-05	9,50E-06	1,02E-03
Acidification potential (AP)		kg SO ₂ eq.	9,23E-01	4,35E-01	1,69E-01	1,53E+00
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	4,30E-01	1,79E-01	4,03E-02	6,50E-01
Photochemical oxidant formation potential (POFP)		kg NMVOC eq.	8,13E-01	5,53E-01	2,10E-01	1,58E+00
Abiotic depletion potential – Elements		kg Sb eq.	4,00E-03	1,67E-03	1,93E-03	7,60E-03
Abiotic depletion potential – Fossil resources		MJ, net calorific value	1,81E+03	4,19E+03	7,81E+02	6,79E+03
Water scarcity potential		m ³ eq.	2,25E+00	8,99E+00	1,07E-01	1,13E+01

Use of resources

PARAMETER		UNIT x ton	Upstream	Core	Downstream	TOTAL
Primary energy resources - Not Renewables	Use as energy carrier	MJ, net calorific value	-1,68E+04	4,63E+03	8,50E+02	-1,13E+04
	Used as raw materials (1.110 kg/ton paper to be recycled - 17 MJ/kg)	MJ, net calorific value	1,89E+04	0,00E+00	0,00E+00	1,89E+04
	TOTAL	MJ, net calorific value	2,08E+03	4,63E+03	8,50E+02	7,56E+03
Primary energy resources - Renewables	Use as energy carrier	MJ, net calorific value	6,73E+02	1,85E+01	1,36E+01	7,05E+02
	Used as raw materials	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	TOTAL	MJ, net calorific value	6,73E+02	1,85E+01	1,36E+01	7,05E+02
Secondary material (Paper to be recycled)		kg	1,11E+03	0,00E+00	0,00E+00	1,11E+03
Renewable secondary fuels		MJ, net calorific value	0,000E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable secondary fuels		MJ, net calorific value	0,000E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water		m ³	8,56E-01	3,11E+00	1,53E-01	4,12E+00

Waste production and output flows

Waste production

PARAMETER	UNIT x ton	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	0	0	0	0
Non-hazardous waste disposed	kg	0	9,39E+01	0	9,39E+01
Radioactive waste disposed	kg	7,90E-03	7,79E-03	5,29E-03	2,10E-02

The amount of hazardous wastes as outflows from the system is zero, because all treatment processes are included within the system boundaries

Output flows

PARAMETER	UNIT x ton	Upstream	Core	Downstream	TOTAL
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	2,44E+00	0,00E+00	2,44E+00
Materials for energy recovery*	kg	0,00E+00	4,80E-02	0,00E+00	4,80E-02
Exported energy, electricity	MJ	0,00E+00	6,58E+02	0,00E+00	6,58E+02
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

*Hazardous waste for incineration

Environmental performance product 2: *greenpaper*®

Potential environmental impact

PARAMETER		UNIT x ton	Upstream	Core	Downstream	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	1,39E+02	2,36E+02	1,02E+01	3,85E+02
	Biogenic	kg CO ₂ eq.	7,19E+00	2,04E+00	3,21E-03	9,24E+00
	Land use and land transformation	kg CO ₂ eq.	1,64E+00	1,57E-02	4,68E-03	1,66E+00
	TOTAL	kg CO₂ eq.	1,47E+02	2,38E+02	1,02E+01	3,96E+02
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	9,64E-04	4,44E-05	1,72E-06	1,01E-03
Acidification potential (AP)		kg SO ₂ eq.	9,23E-01	3,09E-01	3,31E-02	1,27E+00
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	4,30E-01	1,50E-01	8,01E-03	5,88E-01
Photochemical oxidant formation potential (POFP)		kg NMVOC eq.	8,13E-01	3,95E-01	3,99E-02	1,25E+00
Abiotic depletion potential – Elements		kg Sb eq.	4,00E-03	6,92E-04	3,56E-04	5,05E-03
Abiotic depletion potential – Fossil resources		MJ, net calorific value	1,81E+03	3,63E+03	1,47E+02	5,59E+03
Water scarcity potential		m ³ eq.	2,25E+00	8,91E+00	2,31E-02	1,12E+01

Use of resources

PARAMETER		UNITx ton	Upstream	Core	Downstream	TOTAL
Primary energy resources – Non - Renewable	Use as energy carrier	MJ, net calorific value	-1,68E+04	4,03E+03	1,59E+02	-1,26E+04
	Used as raw materials (1.110 kg/ton paper to be recycled - 17 MJ/kg)	MJ, net calorific value	1,89E+04	0,00E+00	0,00E+00	1,89E+04
	TOTAL	MJ, net calorific value	2,08E+03	4,03E+03	1,59E+02	6,27E+03
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	6,73E+02	1,25E+01	1,94E+00	6,88E+02
	Used as raw materials	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	TOTAL	MJ, net calorific value	6,73E+02	1,25E+01	1,94E+00	6,88E+02
Secondary material (Paper to be recycled)		kg	1,11E+03	0,00E+00	0,00E+00	1,11E+03
Renewable secondary fuels		MJ, net calorific value	0,000E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable secondary fuels		MJ, net calorific value	0,000E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water		m ³	8,57E-01	3,09E+00	8,88E-03	3,95E+00

Waste production and output flows

Waste production

PARAMETER	UNITx ton	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	0,00E+00	9,39E+01	0,00E+00	9,39E+01
Radioactive waste disposed	kg	7,78E-03	2,71 E-03	9,63E-04	1,15E-02

The amount of hazardous waste as outflows from the system is zero, because all treatment processes are included within the system boundaries

Output flows

PARAMETER	UNIT x ton	Upstream	Core	Downstream	TOTAL
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	2,44E+00	0,00E+00	2,44E+00
Materials for energy recovery*	kg	0,00E+00	4,80E-02	0,00E+00	4,80E-02
Exported energy, electricity	MJ	0,00E+00	6,58E+02	0,00E+00	6,58E+02
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

*hazardous waste to inceneration

Additional information

Benefits of proximity recycling:

Greenpaper® - GreenboxX®

closed loop recycled corrugated packaging

Cartesar Spa sustainability policy focuses on providing correct information about its packaging features and environmental impacts, origin of raw materials and recycling/reuse possibilities.

Cartesar stands between the founders of **"Rete per il packaging Sostenibile"**, a network of companies joint together to implement closed loop recycling projects to integrate customers' sustainability objectives creating a real circular economy system that guarantees, through proximity recycling and a local value chain, emission reductions, traceability and legality of the whole cycle.

Main purpose of the project is to allocate waste paper generated by local customers' plants to the recycling cycle managed by Cartesar Spa and Rete per il Packaging Sostenibile and use it (mixed with other local waste-paper) to produce the greenpaper® and a new type of corrugated packaging called greenboxX®, bearing FSC® certification and EPD®, environmental impact declaration. The project makes it possible to give effect to the Principle of Proximity and to feed a traceable, legal and sustainable local value chain.

Closed loop packaging



In general, waste-paper generated by industrial productions is collected by an authorized operator, transported to the platform and then placed on the market to be sold in the country or abroad: a single economic transaction that benefits few people.

Circular economy projects of closed loop recycling allow customers to consciously decide a specific destination for their secondary raw materials and do not to alienate from the territory the value chain related to their transformation and recycling: in this way it is possible to preserve jobs and contribute to local wealth in a perspective of shared social responsibility and reduction of environmental impact.

Being aware of the destination of its own waste-paper is the natural extension of the PPP (polluter pays principles: OECD - EE UU) better defined also by the EPR (extended producer responsibility) whilst local recycling complies with the Directive 2008/98 / EC of the European Parliament and with the "proximity principle", according to which waste should be treated at the closest available facilities.



References

GENERAL PROGRAMME INSTRUCTIONS FOR THE INTERNATIONAL EPD® SYSTEM

Versione 3.1 del 2019-09-18

*PCR: CORRUGATED PAPER AND PAPERBOARD PRODUCT GROUP: UN CPC 32151 2013:07
VERSION 2.11 VALID UNTIL: 2021-08-11,*

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Overview and methodology, data v.2, 2007. Rolf Frischknecht, Niels Jungbluth (Editors), Ecoinvent report N.1, Dubendorf, December 2007.

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UNI EN ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations.

*UNI EN ISO 14044: 2018, Gestione ambientale - Valutazione del ciclo di vita - Requisiti e linee guida.
ISO14040: 1997 - Environmental management - Life cycle assessment - Principles and framework*

ISO 14044: 2006 - Environmental Management — Life Cycle Assessment — Requirements and Guidelines

Cartesar Spa -Life Cycle Assessment | "other papers" | |greenpaper®

The study was commissioned by:

Cartesar Spa
Via Carlo De Iulii
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www.cartesar.it

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