



# BORLOTTI BEANS

GLASS JAR 370g

## Environmental Product Declaration

An EPD should provide current information, and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com).  
This EPD is compliant with ISO 14025.

**Programme:** The International EPD® System, [www.environdec.com](http://www.environdec.com)

**Programme operator:** EPD International AB

Conserve  Italia

 EPD®



### CPC CODE

2139 - Other prepared  
and preserved vegetables,  
pulses and potatoes



### GEOGRAPHICAL SCOPE

Europe



### PUBLICATION DATE

05-01-2022

VALID UNTIL: 29-12-2026



### REV.

0.0



### N° REG.

S-P-05154



### VALIDATED

Environmental  
Product Declaration

# 1. THE ENVIRONMENTAL PRODUCT DECLARATION

## WHAT IS EPD (ENVIRONMENTAL PRODUCT DECLARATION)

**EPD** The EPD (Environmental Product Declaration) is a document verified and registered that communicates transparent and comparable information about the environmental performance of a product evaluated along its life cycle.

The Environmental Product Declarations take advantage of new market opportunities to inform consumers and stakeholders about the environmental performance of products and services. The peculiarities of the EPD translate into a series of advantages both for organizations that process declarations and for those who use the information contained in them.

The **International EPD® System** is the program for environmental declarations based on the ISO Standard 14025.



More information on [www.environdec.com](http://www.environdec.com)

## WHAT ARE ITS CHARACTERISTICS

- **OBJECTIVE.** Environmental performance is calculated using the life cycle analysis methodology (Life Cycle Assessment, LCA), following the ISO 14040 series.
- **CREDIBLE.** The EPD is verified by a third-party body.
- **COMPARABLE.** EPDs belonging to the same product category are comparable since they are developed according to the same rules and requirements (PCR, Product Category Rules).

## THE CERTIFICATION OF THE EPD PROCESS OF CONSERVE ITALIA



Conserve Italia has decided to certify the own internal elaboration process of the Environmental Declarations using a reliable and consolidated model of collection, management and processing of data necessary for the realization of the LCA studies of the products subject to certification.

The Control System implemented by Conserve Italia has been verified by a third-party body, in order to certify that all the Environmental Declarations are performed in accordance with the requirements of the International EPD® System. Conserve Italia, having obtained a certification of the process EPD, can independently draw up the Environmental Product Declarations of its products.



## 2. BORLOTTI BEANS

**Cirio Borlotti beans** are Italian beans with a rich flavor and full-bodied consistency, because they are collected and packaged fresh on the same day. Without preservatives, cooked naturally, they are a tasty product. They come from our fields in Lombardy, Emilia Romagna and Veneto where the climatic and environmental conditions are optimal. They are cultivated with integrated production to reduce the environmental impact.



### THE INGREDIENTS



Salt



Water



Borlotti beans

### NUTRITIONAL VALUES

average values per 100g of product

Energy	418 kJ - 99 kcal
Protein	6,8 g
Carbohydrates	13,2 g
of which sugar	0,9 g
Fat	0,8 g
of which saturated	0,2 g
Fibre	6,1 g
Salt	0,6 g





CONTENT DECLARATION		Borlotti beans (kg)	Salt (kg)	Flavoring (kg)	Water (kg)	Primary packaging (kg)	Secondary Packaging (kg)	Tertiary packaging (kg)
REFERRED TO 1 GLASS JAR		0,098	0,005	0,001	0,267	0,258	0,005	0,021
REFERRED TO 1 KG		0,264	0,013	0,002	0,721	0,698	0,013	0,057

PACKAGING		Container size	Sell unit	Tray	Pack format
Glass jar steel can and lid		370 g	12	1	12x1

### 3. THE BEANS

The beans, shelled at source during the harvesting, are immediately sampled for quality control purposes when they reach the plants. The beans are then selected and graded using optical controls which is followed by a second manual control before the beans are washed and blanched in hot water. The beans are processed using part of the cooking liquid, represented by a water and salt solution which enhances the product's conservation in natural way. Cans or glass jars are then closed before the final phase of sterilization.



## 4. THE PRODUCT

In the field of vegetables, Conserve Italia offers a wide range of products that include: peas, borlotti beans, string beans, sweet corn, chickpeas, lentils, mixed vegetables.

The most important products, such as peas, borlotti beans, string beans and sweet corn are obtained from fresh products, exclusively supplied by the co-operative members and cultivated in an absolutely natural way. The OGM free production, for example, is guaranteed thanks not only to the controls carried out in the



field but also starting from the selection of seeds and the purchases carried out by the Group for the co-operative members.

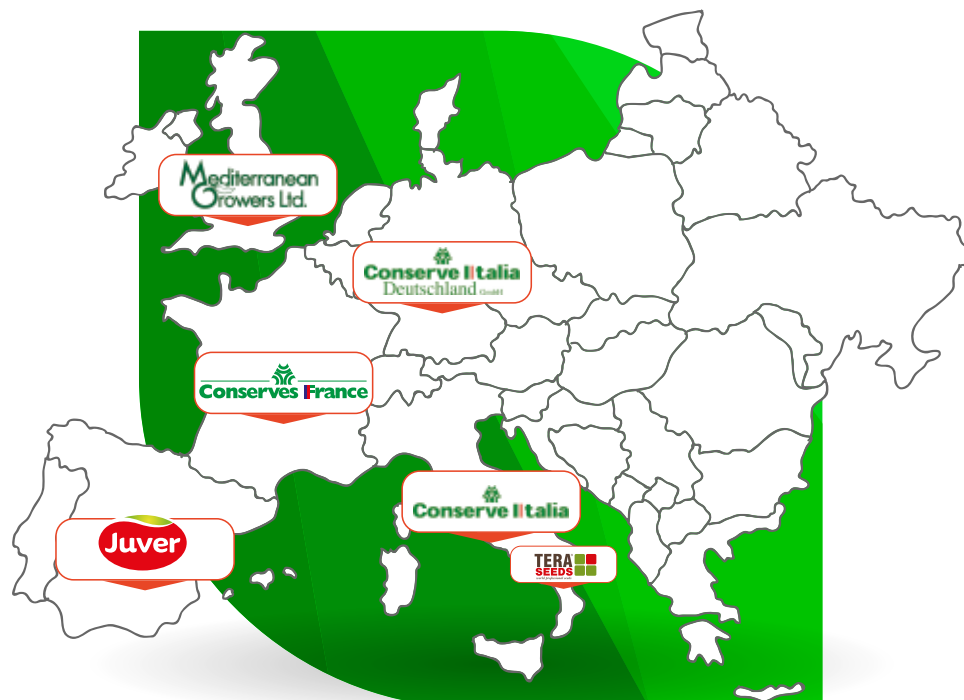
The agricultural planning, from seeding to harvesting, is defined by Conserve Italia's agricultural technicians.

They directly monitor the entire life-cycle from cultivation to production.

Integrated Pest Management protocols are applied as cultivation defense techniques: potential residual phytopharmaceuticals are always monitored and controlled by Conserve Italia's central laboratories before harvesting.

## 5. THE GROUP

Conserve Italia's legal personality is that of an agricultural co-operative and is the mother company to other subsidiary companies in Italy and in Europe.



## 6. THE MISSION

**Conserve Italia**

*The mission statement of Conserve Italia is "to be a leader company in Europe in the sector of preserved foods to achieve the highest value on fruit and vegetables supplied by associated farmers and give to consumers, thanks to food chain control and own brands reliability, guarantees on quality and food safety".*



Conserve Italia represents the leader industry in the Italian field and it is ranked among the leader European companies (Source: Iri Audit incl. discount A.T. June 2013).

The Group processes approximately

**650.000**

tonnes of raw materials every year; fruit, vegetables and tomatoes, grown over a surface area of over

**20.000**

hectares, which are processed in 12 production plants; 8 in Italy, 3 in France and 1 in Spain.



Conserve Italia Group's brand policy has always constituted one of the strategic guidelines and today the branded sales (Valfrutta, Yoga, Derby Blue, Cirio, Juver, St Mamet, Jolly Colombani) represent about 69% of the total turnover; the remaining business being made up of sales for modern retail commercial brands and products

for industry. Conserve Italia has developed a consolidated relationship with all the major retail chains; representing approximately 65% of its turnover. The Ho.Re.Ca. channel (Hotel, Restaurants and Cafés) is also an important channel, especially for beverages as well as for the Foodservice and Vending lines.

## 7. THE BRAND CIRIO

### ABOUT US

Cirio has been the tomato specialist since 1856: an experience of 160 years that has made it one of the symbolic brands of Italian cuisine. Cirio, since 2004, has been part of the Conserve Italia Group, an Agricultural Cooperative Society whose social base is made up of over



who cultivate in open fields with integrated certified production systems. All the cultivation fields are near the factories where they are processed, packaged and distributed to guarantee their freshness.



### OUR CHARACTERISTICS

Cirio uses tomatoes



**100%  
Italian  
origin**

and controls the entire supply chain; the quality is verified and certified at every stage of sowing, cultivation, processing, production in order to preserve the natural freshness of the harvest.

### THE PLANTS

Conserve Italia directly manages seven plants in Italy, in Emilia-Romagna, in Tuscany and in Apulia. The plant at Pomposa in Ferrara, which was built between 2002-2004 has an overall surface area of 440,000 sq.m., of which approximately 120,000 covered, and a production capacity for the processing of over 350,000 tonnes of raw materials including tomatoes, vegetables and fruit. The plant is specialized in processing of sieved, chopped and concentrated tomatoes, fruit in syrup and vegetables in cans and glass jars.

The plants of **Barbiano di Cotignola and Massa Lombarda (RA)** are for processing fruit juices, nectars and fruit based drinks.

The **Alseno (PC)** plant is specialized in vegetables and sweet corn processing.

The plants in **Ravarino (MO)**, **Albinia (GR)** - EMAS - registered site (Reg.n. IT - 000826) - and **Mesagne (BR)** are dedicated to the production of tomato based products (sieved, chopped, concentrates and sauces).



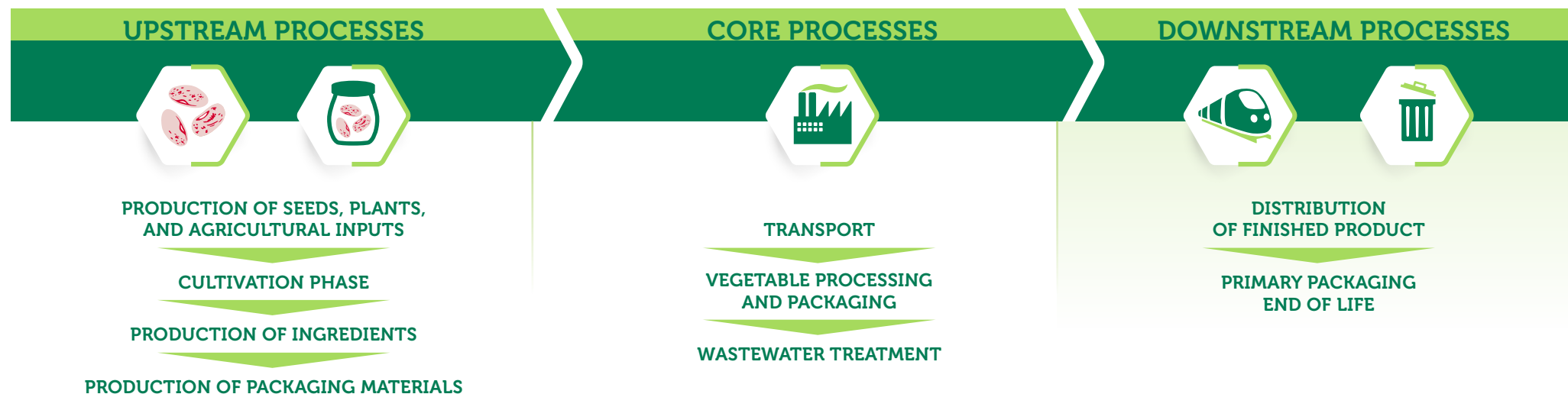
Borlotti beans – Glass jar 370 g, object of the study, are produced in the plants at Alseno (PC).

## 8. ENVIRONMENTAL PERFORMANCE DECLARATION

The declared unit is 1 kg of packaged product.

Specific data were collected on the plant for the year 2019.

### SYSTEM BOUNDARIES



### METHODOLOGY



The methodology used in order to evaluate the environmental performance of the product is the Life Cycle Assessment (LCA), according to the ISO 14040-14044 standards. The goal of the LCA study is to evaluate the potential environmental impact associated to the production of Borlotti beans – glass jar 370 g.



Air and water emissions caused by the use of nitrogen- and phosphorous-based fertilizers utilized by the system plant and for the cultivating operations have been calculated in accordance with § 4.8 of the PCR 2019:10 Prepared and preserved vegetable and fruit products, including juice.



The **Water Footprint Profile** is calculated in accordance to ISO 14046 standard, through a Water Footprint Assessment integrated in the LCA study.

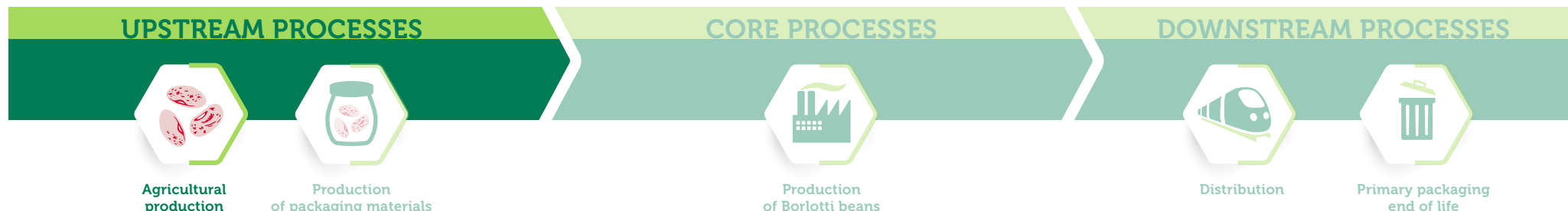


For the modeling of the electricity used in the processes, the supplier's specific residual mix for the reference year has been used.

All life cycle phases were analyzed and accounted for in the study. This EPD and further information about it are available on the website of the International EPD® System: [www.environdec.com](http://www.environdec.com)



## 9. AGRICULTURAL PRODUCTION



### BEANS

Data collection relating to the cultivation phase is been included in a larger project called "Precision sustainable agriculture". Data on the yield of the cultivated product, on fertilizers, on the consumption of water and diesel for the processing of the land have been collected at representative companies for the various crops and for the geographical areas of membership of the agricultural cooperatives.



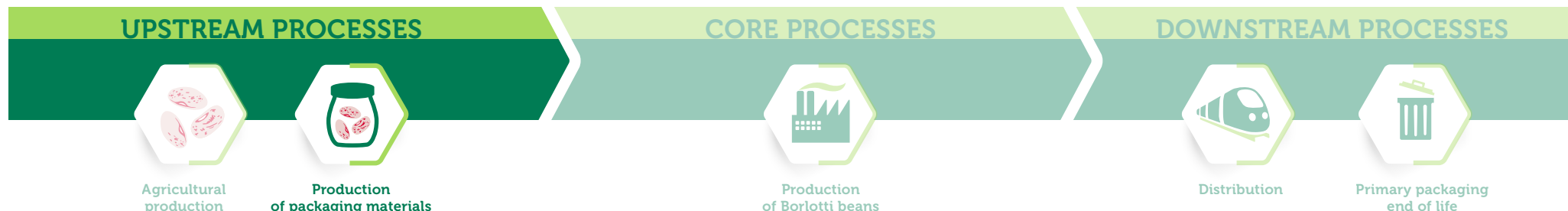
Conserve Italia, in collaboration with the University of Genoa, has carried out a project that led to the development of a new indicator, the Water-Energy-Food (WEF) Nexus, which considers the synergies between Water - Food and Energy for the agricultural phase



### OTHER INGREDIENTS

In the LCA study, all the ingredients present in the product and materials used in the cultivation phase have been modeled using data deriving from internationally recognized databases.

## 10. PRODUCTION OF PACKAGING



### PRIMARY PACKAGING

The primary packaging of the products, otherwise the packaging conceived to establish a sales unit at the point of sale for the end user or the consumer, is essentially made up from tinplate, glass, poly laminated or plastic. In the LCA study, the packaging materials were modeled using data from internationally recognized databases. Conscious of the contribution of the food industry to production of packaging, Conserve Italia is constantly committed to minimize the weight and volume of packaging, by the limits necessary to guarantee the levels of safety, quality and acceptability of the product by the consumer.

#### Useful link

<http://www.ilfattoalimentare.it/sostenibilit.html>



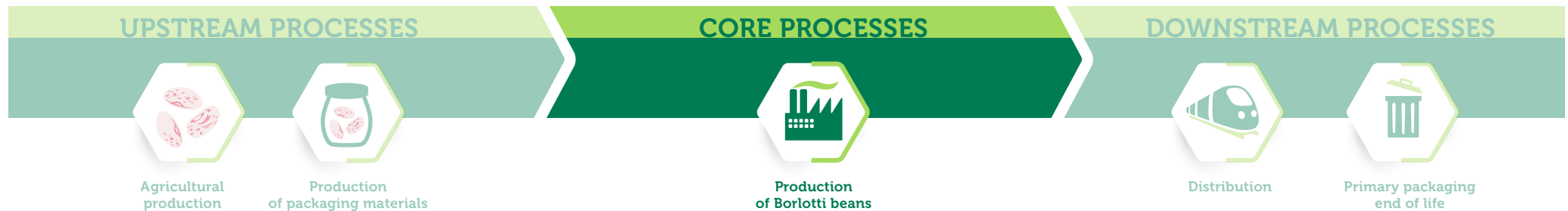
Conserve Italia has been working for years on the reductions of the weights of primary packaging to reduce its impact environmental with a view to continuous improvement



### TERTIARY PACKAGING

Tertiary packaging, otherwise the packaging conceived in order to facilitate manipulation and transport of the finished product, is chosen by Conserve Italy with sustainability criteria, such as durability, lightness and use of environmentally friendly materials. In particular, the pallets used by Conserve Italia are all multi-use and reusable packaging. Once the reuse is over, these pallets are 100% recyclable.

## 11. PRODUCTION OF BORLOTTI BEANS



### PLANTS

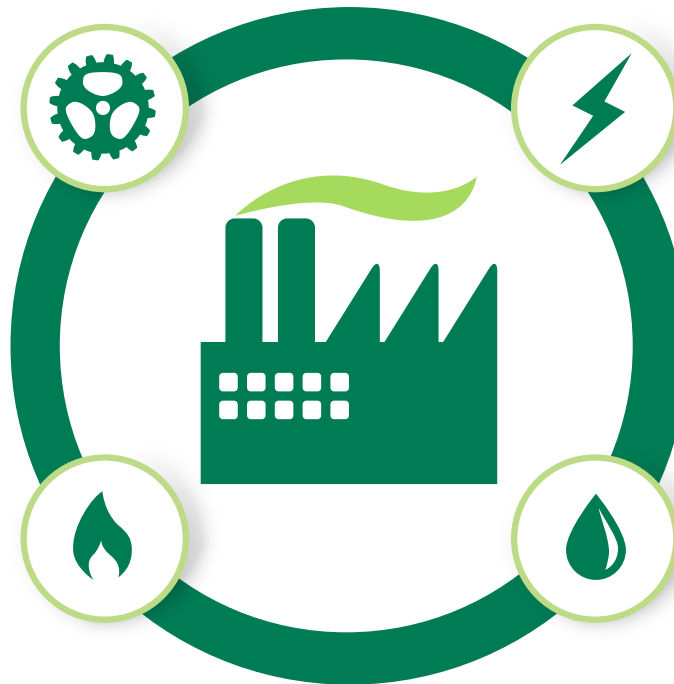
The production of the products of the Conserve Italia plants includes the following life cycle stages:

1. Preparation of the finished product (e.g. washing, mixing, heat treatments, ...) from fresh or semifinished product.
2. Packaging process.
3. Refrigerated storage (where applicable).
4. Water purification.

Management data related to the reference year are collected annually at the plants involved and subsequently reported to the processing of the product. Below, the main data collected on the plants involved in the production of products are reported.

### GREENHOUSE GASES

All Conserve Italia plants fall within the scope of application of the "Emissions Trading" Directive (Directive 2003/87/EC), that is they are subject to the monitoring and communication of the greenhouse gas emissions. The data on CO<sub>2</sub> emissions are annually calculated and verified by a body accredited by the Competent National Authority.



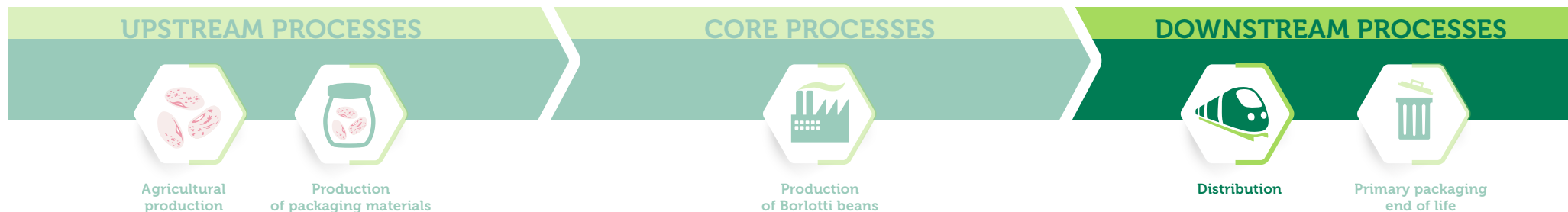
### ELECTRICITY

The electrical consumption of the plants is one of the significant environmental aspects on which Conserve Italia has decided to act with energy efficiency measures and choosing suppliers that favour certain sources from renewable sources. In particular, all Valfrutta products on the market - fruit preserves (juices and nectars, fruit in syrup and jams), tomato preserves (pureed, pulp, peeled) and vegetable preserves (corn and legumes) - come from plants that for these processing lines use only certified electricity from renewable sources.

### WATER

In the Conserve Italia plants, the water resource is considered a primary resource to be protected and preserved. For this reason in all the plants actions and processes for the recovery of water and its purification are implemented. The percentage of water recovered in the production cycle guarantees on average a recovery rate > 33%, including the water resource which is used for the transport of fresh raw material up to the washing and cooking phase.

## 12. DISTRIBUTION



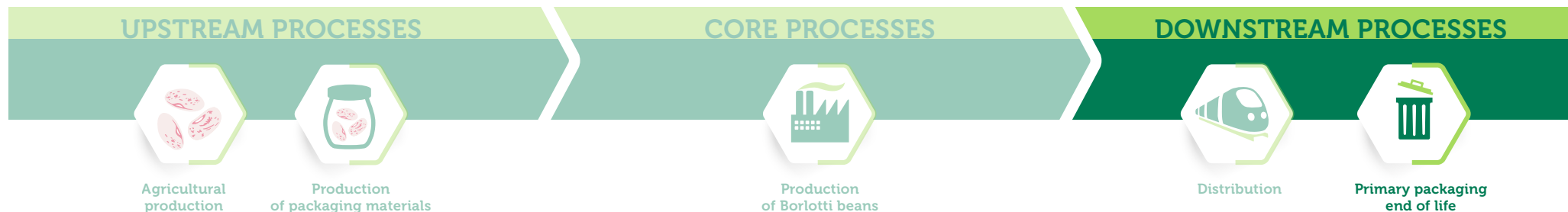
Conserve Italia has created a network of logistic centres dedicated to storage and shipment of finished products, able to ensure quick and cost-saving transfers for the products up to the Distribution Centers of the modern distribution chains or to the distributors of the traditional channels operating in retail and in the Ho.re.ca.. The most important storage and shipping warehouses are highly automated and are placed near the processing plants or in strategic areas for sorting goods at European level.



In addition to traditional road transport, multimodal transport has been developed, with the preparation of 5 special weekly trains, for transport on the lines north-south, which today covers about 20% of shipments, outdoing the national average for rail transport.



## 13. PACKAGING END OF LIFE










Conserve Italia uses as primary packaging for its products essentially tinplate, glass, poly laminated or plastic. All packaging used for Conserve Italia product, using materials that fall into the categories treated by CONAI (National Packaging Consortium), are 100% recyclable. CONAI in fact directs the activity and guarantees the results recovery of 6 Consortia of materials: steel (Ricrea), aluminum (Cial), paper/cardboard (Comieco), wood (Rilegno), plastic (Corepla), glass (Coreve).



According to the final data for 2019 published by the Consortium, the data relating to packaging sent for recycling stands at 77,3% of the amount released for consumption, for a total of 2,366,000 tons (Source COREVE).

## 14. RESOURCES USE

PARAMETERS Data refer to 1 Kg of product		UNIT	UPSTREAM		CORE	DOWNSTREAM		TOTAL
			Agriculture <sup>1</sup> 	Packaging 		Distribution 	End of life <sup>2</sup> 	
 Primary energy resources renewable	Use as energy carrier	MJ. net calorific value	0,239	1,685	0,056	0,042	<0,001	2,023
	Use as raw materials	MJ. net calorific value	0,006	0,814	0,006	0,009	<0,001	0,834
	<b>TOTAL</b>	<b>MJ. net calorific value</b>	<b>0,245</b>	<b>2,499</b>	<b>0,062</b>	<b>0,051</b>	<b>&lt;0,001</b>	<b>2,857</b>
 Primary energy resources not renewable	Uso come vettore energetico	MJ. net calorific value	1,940	9,922	5,310	1,014	0,006	18,193
	Use as raw materials	MJ. net calorific value	0,003	0,323	<0,001	<0,001	<0,001	0,327
	<b>TOTAL</b>	<b>MJ. net calorific value</b>	<b>1,944</b>	<b>10,245</b>	<b>5,310</b>	<b>1,014</b>	<b>0,006</b>	<b>18,519</b>
Secondary material <sup>3</sup>		kg	-	0,199	-	-	-	0,199
Renewable secondary fuels		MJ	-	-	-	-	-	-
Non renewable secondary fuels		MJ	-	-	-	-	-	-
Net use of fresh water		m <sup>3</sup>	0,106	0,007	0,004	<0,001	<0,001	0,118

<sup>1</sup> All phases relating to the Upstream are included, with the exception of the production of packaging (production of seeds, plants and agricultural inputs, cultivation phase and production of ingredients).

<sup>2</sup> Primary packaging end of life.

<sup>3</sup> Data refer to the use of recycled cardboard in secondary and tertiary packaging, the use of 58% recycled tin-plated steel and 25% recycled glass.

## 15. ENVIRONMENTAL IMPACTS



**PARAMETERS**  
Data refer to 1 Kg of product

**UNIT**

**UPSTREAM**

Agriculture<sup>1</sup>

Packaging

**CORE**

**DOWNSTREAM**

Distribution

End of life<sup>2</sup>

**TOTAL**

Global warming potential (GWP)	Fossil	Kg CO <sub>2</sub> eq	0,133	0,753	0,305	0,061	<0,001	<b>1,252</b>
	Biogenic	Kg CO <sub>2</sub> eq	<0,001	0,003	<0,001	<0,001	<0,001	<b>0,003</b>
	Land use	Kg CO <sub>2</sub> eq	<0,001	<0,001	<0,001	<0,001	<0,001	<b>0,001</b>
	<b>TOTAL</b>	<b>Kg CO<sub>2</sub> eq</b>	<b>0,133</b>	<b>0,756</b>	<b>0,305</b>	<b>0,061</b>	<b>&lt;0,001</b>	<b>1,256</b>
Acidification potential (AP)		Kg SO <sub>2</sub> eq	0,002	0,003	<0,001	<0,001	<0,001	<b>0,006</b>
Eutrophication potential (EP)		Kg PO <sub>4</sub> <sup>3</sup> eq	0,001	<0,001	<0,001	<0,001	<0,001	<b>0,001</b>
Formation potential of tropospheric ozone (POCP)		Kg C <sub>2</sub> H <sub>4</sub> eq	<0,001	<0,001	<0,001	<0,001	<0,001	<b>&lt;0,001</b>
Abiotic depletion potential Elements		Kg Sb eq	<0,001	<0,001	<0,001	<0,001	<0,001	<b>&lt;0,001</b>
Abiotic depletion potential Fossil fuels		MJ. net calorific value	1,771	8,883	4,712	0,832	0,006	<b>16,204</b>
Water scarcity potential		m <sup>3</sup> eq	4,750	0,252	0,196	0,005	<0,001	<b>5,203</b>

<sup>1</sup> All phases relating to the Upstream are included, with the exception of the production of packaging (production of seeds, plants and agricultural inputs, cultivation phase and production of ingredients).

<sup>2</sup> Primary packaging end of life.

## 16. WASTE PRODUCTION AND OTHER INDICATORS



### PARAMETERS Data refer to 1 Kg of product

UNIT

#### UPSTREAM

Agriculture<sup>1</sup>



Packaging



#### CORE



#### DOWNSTREAM

Distribution



End of life<sup>2</sup>



TOTAL

Hazardous waste disposed

Kg

<0,001

<0,001

<0,001

<0,001

<0,001

**<0,001**

Non hazardous waste disposed

Kg

0,002

0,157

<0,001

<0,001

0,157

**0,317**

Radioactive waste disposed

Kg

<0,001

<0,001

<0,001

<0,001

<0,001

**<0,001**



### PARAMETERS Data refer to 1 Kg of product

UNIT

#### UPSTREAM

Agriculture<sup>1</sup>



Packaging



#### CORE



#### DOWNSTREAM

Distribution



End of life<sup>2</sup>



TOTAL

Components for reuse<sup>4</sup>

Kg

-

-

0,168

-

-

**0,168**

Material for recycling

Kg

-

-

-

-

-

-

Materials for energy recovery<sup>4</sup>

Kg

-

-

-

-

-

-

Exported energy, electricity

MJ

-

-

-

-

-

-

Exported energy, thermal

MJ

-

-

-

-

-

-

<sup>1</sup> All phases relating to the Upstream are included, with the exception of the production of packaging (production of seeds, plants and agricultural inputs, cultivation phase and production of ingredients).

<sup>2</sup> Primary packaging end of life.

<sup>4</sup> Data refers to by-products used as soil improver and sent to biodigester.





## OTHER INDICATORS

UNIT

### UPSTREAM

Agriculture<sup>1</sup>



Packaging



### CORE



### DOWNSTREAM

Distribution



End of life<sup>2</sup>



TOTAL

Land use (occupation)

m2a

32,490

-

-

-

-

**32,490**

Ecological footprint

m2a

0,324

2,233

0,780

0,184

0,001

**3,522**



## WATER FOOTPRINT PROFILE

UNIT

### UPSTREAM

Agriculture<sup>1</sup>



Packaging



### CORE



### DOWNSTREAM

Distribution



End of life<sup>2</sup>



TOTAL

Human toxicity

Kg 1,4-DB eq

0,022

1,809

0,010

0,014

<0,001

**1,855**

Fresh water aquatic ecotoxicity

Kg 1,4-DB eq

0,002

0,005

0,001

0,001

<0,001

**0,008**

Marine aquatic ecotoxicity

Kg 1,4-DB eq

9,32

321,56

14,62

10,65

0,01

**356,16**

Terrestrial ecotoxicity

Kg 1,4-DB eq

<0,001

0,003

<0,001

<0,001

<0,001

**0,003**

Acidification potential (AP)

Kg SO<sub>2</sub> eq

0,002

0,003

<0,001

<0,001

<0,001

**0,006**

Eutrophication potential (EP)

Kg PO<sub>4</sub><sup>3-</sup> eq

0,001

<0,001

<0,001

<0,001

<0,001

**0,001**

Water use

m<sup>3</sup>

0,106

0,007

0,004

<0,001

<0,001

**0,118**

Water scarcity potential

m<sup>3</sup> eq

4,750

0,252

0,196









0,005

<0,001

**5,203**

<sup>1</sup> All phases relating to the Upstream are included, with the exception of the production of packaging (production of seeds, plants and agricultural inputs, cultivation phase and production of ingredients).

<sup>2</sup> Primary packaging end of life.

 <b>Borlotti beans</b>	UNIT	UPSTREAM		CORE	DOWNSTREAM		TOTAL
		Agriculture <sup>1</sup> 	Packaging 		Distribution 	End of life <sup>2</sup> 	
 <b>ECOLOGICAL FOOTPRINT</b>	m2a	0,324	2,233	0,780	0,184	0,001	<b>3,522</b>
 <b>CARBON FOOTPRINT</b>	Kg CO <sub>2</sub> eq	0,133	0,756	0,305	0,061	<0,001	<b>1,256</b>
 <b>WATER FOOTPRINT<sup>5</sup></b>	m <sup>3</sup>	0,106	0,007	0,004	<0,001	<0,001	<b>0,118</b>

<sup>1</sup> All phases relating to the Upstream are included, with the exception of the production of packaging (production of seeds, plants and agricultural inputs, cultivation phase and production of ingredients).

<sup>2</sup> Primary packaging end of life.

<sup>5</sup> Water footprint profile - Water use

## 17. INFORMATION



### RECYCLING OF PRIMARY PACKAGING



The primary packaging is a 100% recyclable material and it has to be directed to the waste separation procedures according to the rules of the pertaining municipalities.



### ETHICAL CODE

Conserve Italia, within its activities, adopt the Ethical Code that outlines the basic principles of behavior of the company: pillars that lie on solid foundation of respect of law, honesty, transparency of information, quality and safety of products, responsibility towards community and environment.



### PRODUCT CERTIFICATIONS

The product object of the study is in compliance with **BRC** (British Retail Consortium) and **IFS** (International Food Standard) standards for safety, legality and quality of products.

Certified and guaranteed by **CESI** (Centro Elettrotecnico Sperimentale Italiano) for renewable origin, the energy used by Valfrutta processing is **100% renewable energy** as stated by the label present in the packaging of all the products.

## 18. CERTIFICATION BODY

EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden,  
E-mail: info@environdec.com

EPDs developed within the same product category but according to different programs may not be comparable.  
Conserve Italia has the ownership and responsibility of this EPD.

Product category rules (PCR): Prepared and preserved vegetable and fruit products, including Juice; 2019:10 version 1.01; UN CPC 213, 214

PCR review was conducted by: The Technical Committee of the International EPD® System.

Chair: Adriana Del Borghi Contact via 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: DNV GL Business Assurance

Signature of the third-party verifier

Accredited by: ACCREDIA

ACCREDIA Accreditation n.: 008H

Procedure for follow-up of data during EPD validity involves third party verifier:

☒ Yes ☐ No

## 19. REFERENCES

General Programme instructions for the International EPD® System, v.3.01 PCR 2019:10 v.1.01 UN CPC 213, 214 Prepared and preserved vegetable and fruit products, including juice

ISO 14046:2014 Environmental management – Water Footprint – Principles, requirements and guidelines  
Database Ecoinvent v.3.4 (www.ecoinvent.org)

Life Cycle Analysis "EPD PROCESS LIFE CYCLE ASSESSMENT CONSERVE ITALIA PRODUCTS", Tetis Institute Srl, 2021, Rev.15

[COREVE 2019. Glass recycling data 2019](#)

[RICREA 2019](#)

[COMIECO 2019 \(National Consortium for Recovery and Recycling of Cellulose-Based Packaging\) "25th Annual Comieco Report on the separate collection of paper and cardboard in Italy"](#)

[COREPLA 2019](#)

IRI - Information Resources Srl. Iri Audit including discount A.T. June 2013

WATER PROCESS Technical Report "Creation of a model for quantifying the impact on the water sector determined by the cultivation of plant products", Project Measure 16.2, CENS - University of Genoa, 2021, Vers. 1

For the environmental impacts, the characterisation methods indicated on the website EPD® International System were used (https://www.environdec.com/resources/indicators); for the Consumption of energy resources the Cumulative Energy Demand (CED) method; for the categories relating to toxicity and ecotoxicity present in the Water Footprint Profile the CML-IA baseline method and for the Ecological Footprint the Ecological footprint method.



## 20. GLOSSARY

### ACIDIFICATION POTENTIAL (AP)

drop in pH of soils, lakes, forests, due to air emissions of acidifying compounds, with harmful effects on living organisms, e.g. "acid rains".

### ECOLOGICAL FOOTPRINT

the Ecological Footprint is a complex indicator that measures the biologically productive area of the sea and of land necessary to regenerate the resources consumed by a human population and to absorb the waste produced from the consumption of fossil and nuclear fuels. It is expressed in soil use over time (m2a)

### GLOBAL WARMING POTENTIAL (GWP100)

years, due to emissions and absorptions attributable to humans, such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), etc.

### EUTROPHICATION POTENTIAL (EP)

reduction in dissolved oxygen levels in water media with collapse of fish and other aquatic species due to excess addition of large quantities of mineral nutrients such as nitrogen and phosphorous and subsequent dramatic increase in flora that feed on these nutrients.

### PHOTOCHEMICAL OZONE CREATION POTENTIAL (POCP)

formation of ozone at ground level due to air emissions of unburnt hydrocarbons and nitrogen oxides in presence of solar radiation. This phenomenon is harmful for living organisms and often present in large urban centres.

### LAND USE

land use represents an impact on biodiversity. Biodiversity depends on the type of use of soil and dimensions of area. In this impact category both regional and local impacts are taken

into consideration and the damage related to land use results from both conversion and occupation of soil. This damage is consequently expressed in m2a: "Land occupation recorded as m2 times year per unit output".

### LIFE CYCLE ASSESSMENT (LCA)

it is a technique - regulated by ISO 14040 standard - to quantify the energetic and environmental load of the life cycle of a product system, through the quantification of energy and material input and air, liquid, solid emissions released into the environment, from raw material extraction to disposal of final waste.

### TOXICITY

the toxicity can be expressed as human toxicity, fresh water aquatic toxicity, marine aquatic toxicity, terrestrial toxicity. The ETP (Eco-Toxicity Potential) is expressed with reference to a compound, i.e. 1,4-dichlorobenzene (1,4 DCB). Therefore the unit is kg 1,4-DB eq.

### FUNCTIONAL UNITY

it is a measure of the function of the studied system and it provides a reference to all the results presented in the EPD. This enables comparison of data presented in two or more EPD related to products within the same category, i.e. pertaining to the same PCR.

### WATER FOOTPRINT (WF)

it is an indicator to quantify the potential impact related to water, calculated - in accordance to ISO 14046 standard - through a water footprint assessment based on a LCA study. The results of the water footprint assessment are represented by an impact indicators profile (water footprint profile).

### WATER SCARCITY (AWARE)

Indicator that represents the equivalent volume of water consumed proportionate to the water availability of the individual countries.

### WATER ENERGY FOOD (WEF) NEXUS

Dimensionless single score indicator that takes into account the Global Warming Potential (in kg CO<sub>2</sub> eq.), The Water Scarcity (in m<sup>3</sup> eq.), The Consumption of energy resources (in MJ) and the Field Yield (in tons / ha). The weighing methodology of the individual indicators defines a weighting of 50% on the agricultural yield (economic-like indicator) and a distribution based on the PEF (Product Environmental Footprint) weighting for the remaining environmental indicators. The indicator is analyzed for the agricultural phase only (1 kg of agricultural product).

### ABIOTIC DEPLETION POTENTIAL - ELEMENTS

Indicator that measures the impacts associated with the consumption of abiotic (non-living) resources, related to the extraction of minerals and other non-renewable materials, which can lead to the exhaustion of natural resources. It is expressed in kilograms of Antimony (kg Sb eq) equivalent.

### ABIOTIC DEPLETION POTENTIAL - FOSSIL FUELS

Indicator that measures the impacts associated with the consumption of fossil fuels and therefore non-renewable resources. For this reason it is quantified in energy terms, in particular in MJ (mega joules).

### USE OF RENEWABLE AND NON-RENEWABLE PRIMARY ENERGY RESOURCES

it is a measure of the environmental impacts related to the consumption of primary energy renewable resources (solar, wind, water, geothermal, biomass) and non-renewable (oil, natural gas, coal and fissile materials), used both as an energy carrier and as a raw material.

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