



ENVIRONMENTAL PRODUCT DECLARATION

ARRABBIATA SAUCE FOR ITALIAN MARKET



The first EPD process
certified in the Food
industries

REGISTRATION NUMBER

S-P-00493

CPC CODE

23995 Sauces
PCR 2010:19
v. 4.0 - 2026-10-19

PUBLICATION DATE

2015/09/01

REVISION

4 of 2023/07/06

VALID UNTIL

2028/01/30

PROGRAMME

The International
EPD® System
www.environdec.com

PROGRAMME OPERATOR

EPD International AB

This EPD has been developed in conformity to ISO 14025. 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.

1. BRAND AND PRODUCT

THE BRAND BARILLA

The Barilla brand is born in 1877 as a small bread and pasta shop in Parma. The best durum wheat and cutting-edge technologies make it possible to offer pasta that always remains “al dente” and ready-made sauces to millions of people around the world.

Further information on **Barilla** website.

THE PLANT AND THE PROCESS

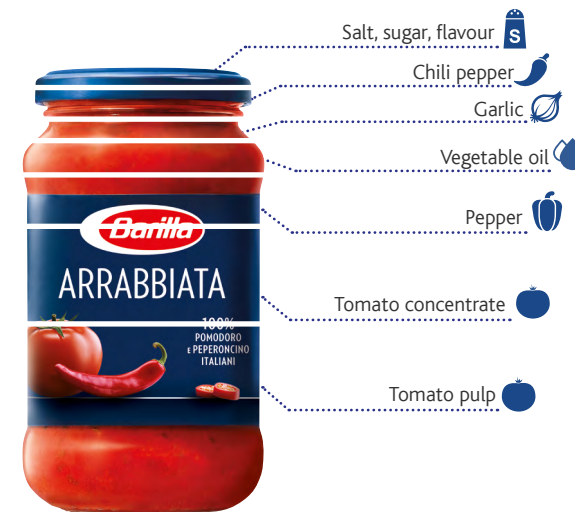
Tomato sauces are produced in an owned plant located in Rubbiano (Italy), where the cooking process is very close to what people would do at home. The process starts from sauté vegetables in oil; tomato pulp is poured when vegetables are browned and herbs are added at the last moment.

After the cooking process, Arrabbiata sauce undergoes a heat treatment to pasteurize the product while preserving flavour and taste as much as possible over time. The pasteurization treatment, coupled with the integrity of the container, allows us to avoid using any preservatives.

The product is sold in package of 400 grams jar.

Sauce can be poured directly cold on the cooked pasta or may be heated up before consumption.

THE PRODUCT



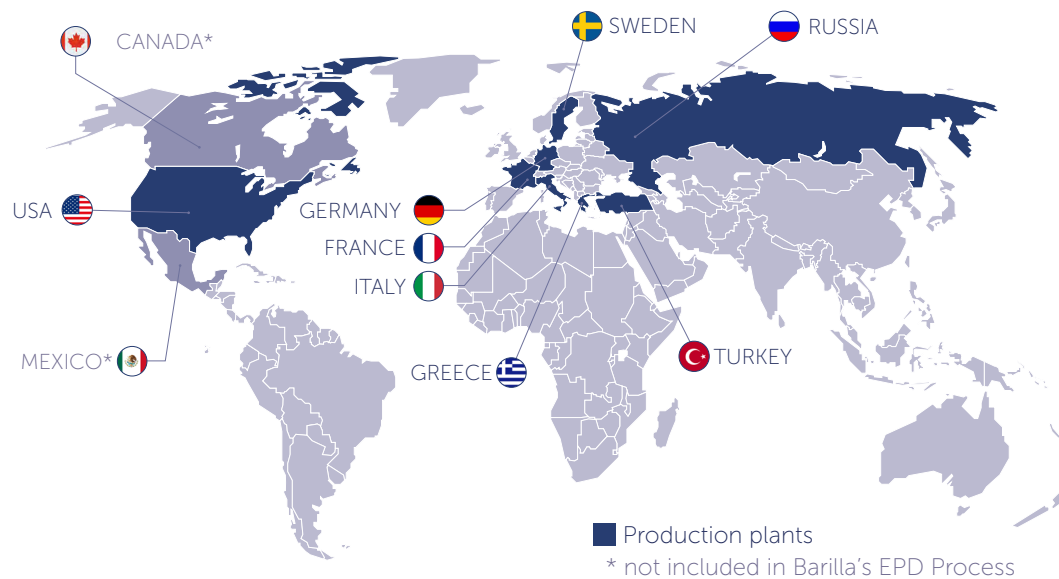
NUTRITIONAL INFORMATION (100 g)		
Energy	kJ	282
	kcal	67
Fats <i>of which saturated</i>	grams	3.2 0.3
Carbohydrates <i>of which sugars</i>	grams	7.4 5.0
Fibres	grams	1.3
Proteins	grams	1.6
Salt	grams	0.95

2. BARILLA GROUP

Our story begins in Parma in 1877, when Pietro Barilla opens a small bakery and pasta shop.

Today, after 145 years, our products are eaten by people throughout the day. We have a presence in over 100 countries thanks to our brands, we have become an icon of excellence in the market for pasta, ready-made sauces, baked goods, and crispbread.

Thanks to the 29 production facilities, each year we provide over 2,109,000 tonnes of products to people.



Our Purpose: The joy of food for a better life

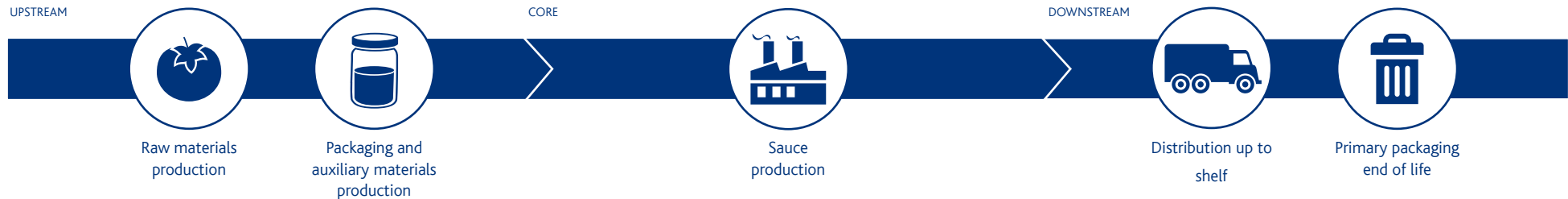
In order to make a concrete contribution to global challenges, Barilla has renewed its commitment to society and the planet with a new Purpose containing the "why" of our way of doing business: "The joy of food for a better life".

It is a commitment from field to fork, to offer people tasty products, made with selected raw materials from responsible supply chains.

Because good food is a joy for the present and a choice for a better future.



3. ENVIRONMENTAL PERFORMANCE CALCULATION



The environmental performance of the product was calculated using the **LCA (life cycle analysis)** methodology, including the entire production chain, beginning with growing the vegetables up until delivery of the finished product to the shelf and end of life of packaging materials. The study was conducted following the specific product rules (PCR) published by the EPD system: “CPC code 23995 – Sauce”. The results are calculated referring to the Version 2.0 of the default list of environmental performance indicators, based on EF 3.0. The proxy data contributes to the calculation of environmental impacts is lower than 10%.

DECLARED UNIT

Data are referred to **1 kg** of product plus the related packaging (the packaging is referred to the **400 g** format, reported to 1 kg of product).

SYSTEM BOUNDARIES

The processes constituting the analysed system were organized in upstream, core and downstream processes, in compliance with the requisites of the EPD system.

GEOGRAPHICAL SCOPE

This EPD is focused on the product distributed in Italy.



4. RAW MATERIALS PRODUCTION



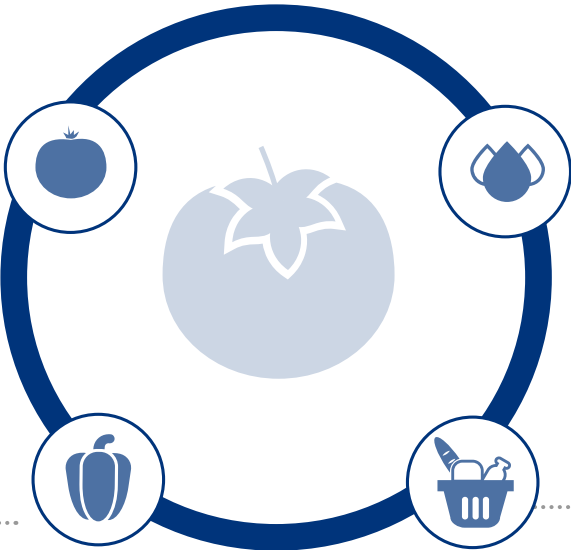
INGREDIENTS PRODUCTION

TOMATO

Impacts related to the tomatoes cultivation have been calculated on the basis of primary data from Barilla suppliers. The semifinished products are produced by suppliers, the processes are modeled using primary data. Reference years 2019-2021.

PEPPER

Pepper cultivation and transformation data come from LCA database (Ecoinvent).



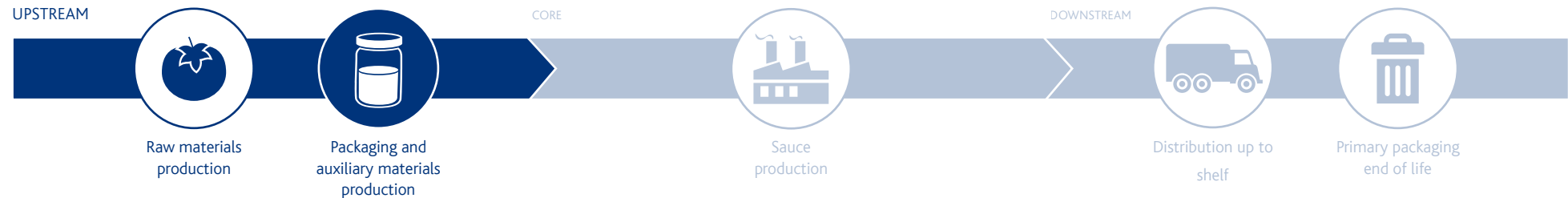
VEGETABLE OIL

Data for vegetable oil production come from secondary data (from Agrifootprint database and World Food LCA database).

OTHER INGREDIENTS

Data related to the sugar come from Barilla suppliers; data related to other raw materials have been collected by LCA database (Ecoinvent, World Food LCA database, Agrifootprint).

5. PACKAGING AND AUXILIARY MATERIALS PRODUCTION



PACKAGING PRODUCTION

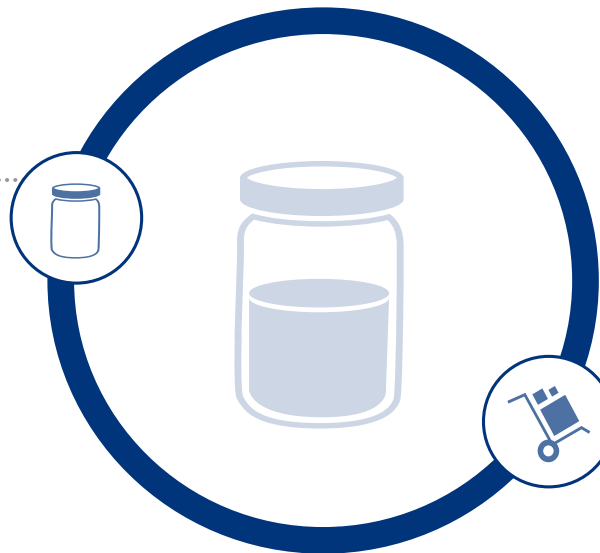
PRIMARY PACKAGING

Packaging environmental performances are calculated using the 400g format and are reported per packaging used for 1 kg of product.
The primary packaging consists in glass jar with screw top.
The total weight of primary packaging is 531 grams per kg of sauce.

Primary data (from packaging unit, referred to current year 2022) are used for packaging amount and packaging materials production; data about packaging production process come from Barilla LCA database.

Packaging used for Barilla products is designed for recycle.

Auxiliary materials environmental performances are evaluated by using primary data from plant, during 2021 year.
Secondary data (Ecoinvent) are used for environmental aspects associated to materials production.

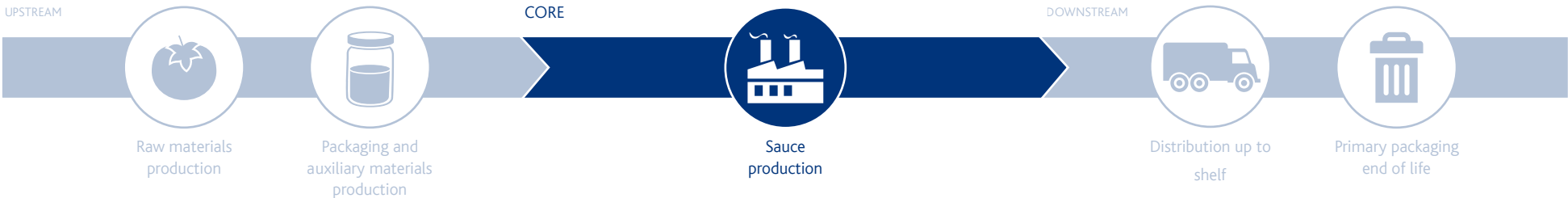


Since 2004, Barilla designs new packaging with the "LCA packaging design tool". It allows the assessment of the environmental impacts of the packaging solutions already during the design phase.

PACKAGING FOR TRANSPORTATION

The packaging for transport consists in cardboard boxes (american box or tray), used for the distribution of the product, and a plastic extensible film.
Data used have been collected from LCA databases (mainly Ecoinvent).
The total weight of packaging for transportation is 21 grams per kg of sauce.

6. SAUCE PRODUCTION



GENERAL INFORMATION

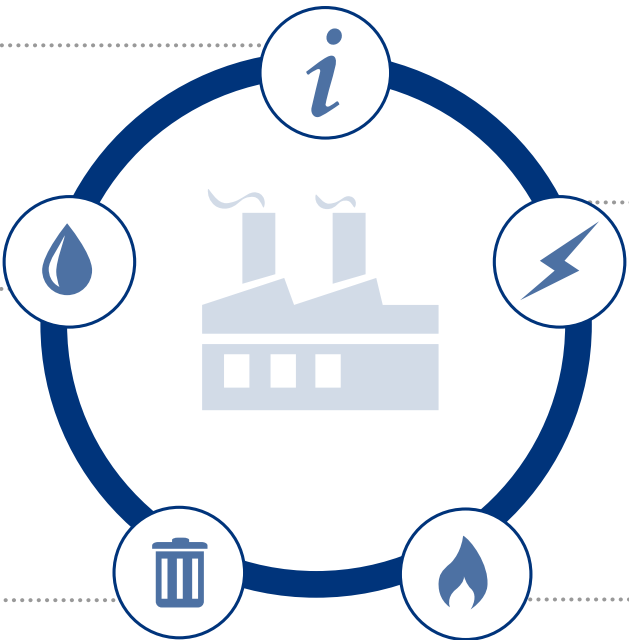
The environmental performance related to production processes is evaluated by considering the energy and the water consumption and the waste production as primary data. Secondary data (mainly Ecoinvent) are used for the environmental aspects related to the production of energy and water.

WATER

Water consumption is evaluated using primary data. The overall value is attributed to the product using the mass allocation procedure. Plant water consumption includes also the water amount needed for ingredients preparation: this amount is included both in plant consumption and product recipe following a precautionary approach. Data refer to sauce production in 2021.

WASTE

The primary data are collected by the plant registrations. The overall value is attributed to the product using the mass allocation procedure. Data refer to sauce production in 2021.



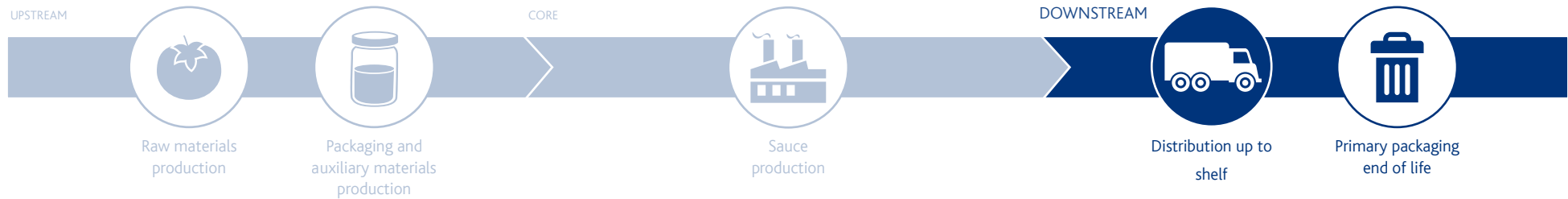
ELECTRICITY

Total plant electricity consumption has been divided using the mass allocation procedure, as the plant produces a number of different sauces. Barilla, through the GO certification system (Guaranty of origin market), buys energy from hydroelectric renewable resources as to cover the entire Rubbiano sauce production. Data are referred to 2021.

NATURAL GAS

Natural gas consumption is evaluated using primary data. The overall value is attributed to the product using the mass allocation procedure. Data refer to sauce production in 2021.

7. DISTRIBUTION



DISTRIBUTION

Arrabbiata sauce is produced in Barilla's Rubbiano plant, Italy.

The products distributed in Italy are transported for about:

- 600 km by truck
- 33 km by ship
- 9 km by train

The product does not require special storage conditions (refrigeration, etc).

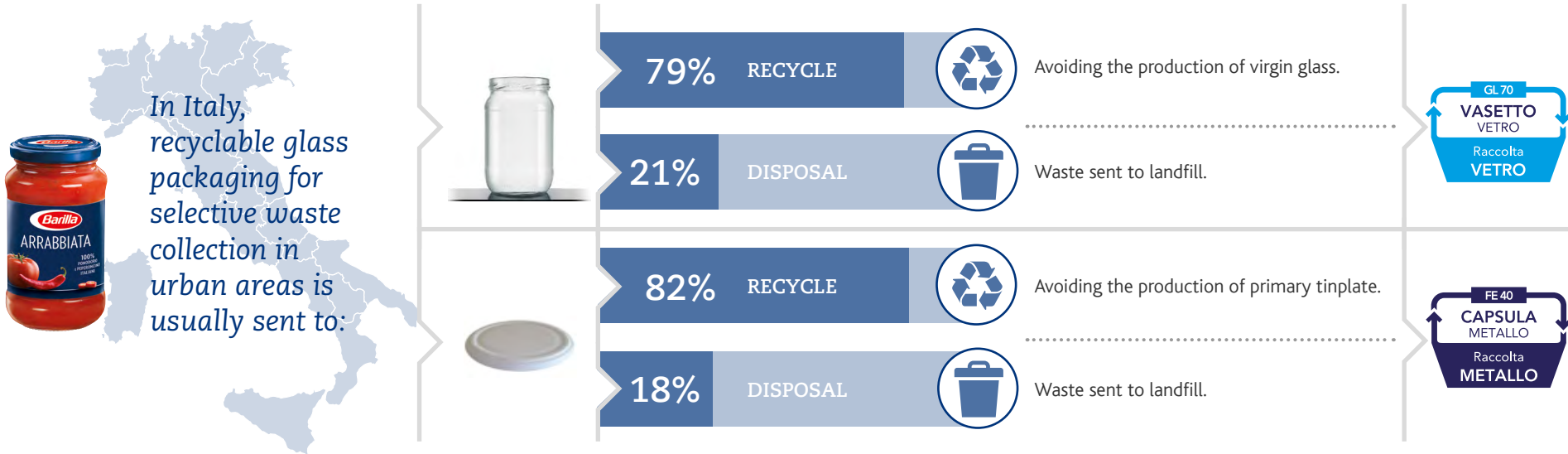
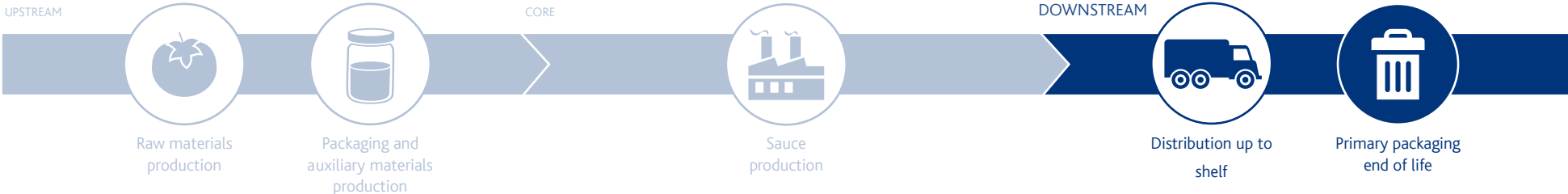
The impacts related to the disposal of the packaging for transport were calculated considering the Italian scenario for paper/board (87% recycling, 8% energy recovery, 5% disposal) and plastic film (29% recycling, 61% energy recovery, 10% disposal).

RUBBIANO

Average distribution















8. PRIMARY PACKAGING END OF LIFE



Data elaborated from CoReVe 2020 report, Ricrea 2019 report, EUROSTAT database (2019 data).

9. ENVIRONMENTAL RESULTS OF ARRABBIATA SAUCE



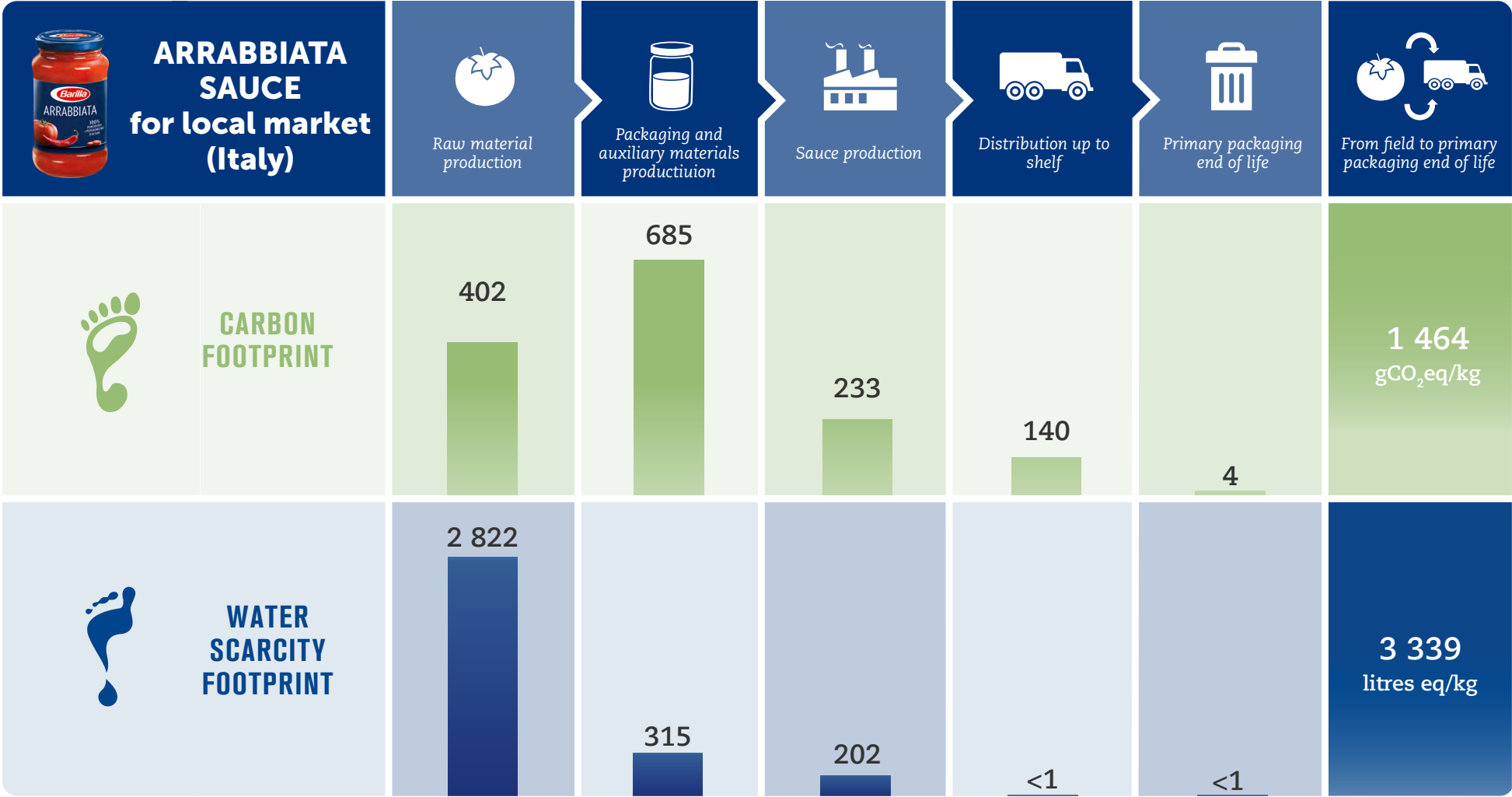
 USE OF RESOURCES data referred to 1 kg of product		UPSTREAM		CORE	DOWNSTREAM		TOTAL
		 Raw material production	 Packaging and auxiliary materials production	 Production	 Distribution up to shelf	 Primary packaging end of life	
PRIMARY ENERGY RESOURCES - RENEWABLE data in MJ	Used as energy carrier	6.75E-01	1.39E+00	6.70E-01	3.92E-03	1.54E-04	2.74E+00
	Used as raw materials ⁽¹⁾	0.00E+00	1.08E-01	0.00E+00	0.00E+00	0.00E+00	1.08E-01
	Total	6.75E-01	1.50E+00	6.70E-01	3.92E-03	1.54E-04	2.85E+00
PRIMARY ENERGY RESOURCES - NON RENEWABLE data in MJ	Used as energy carrier	5.76E+00	9.40E+00	3.53E+00	1.89E+00	5.11E-03	2.06E+01
	Used as raw materials	0.00E+00	1.71E-01	0.00E+00	0.00E+00	0.00E+00	1.71E-01
	Total	5.76E+00	9.57E+00	3.53E+00	1.89E+00	5.11E-03	2.08E+01
 POTENTIAL ENVIRONMENTAL IMPACTS data referred to 1 kg of product		UPSTREAM		CORE	DOWNSTREAM		TOTAL
		 Raw material production	 Packaging and auxiliary materials production	 Production	 Distribution up to shelf	 Primary packaging end of life	
GLOBAL WARMING POTENTIAL - GWP (g CO ₂ eq)	Fossil	3.90E+02	6.62E+02	2.27E+02	1.39E+02	1.75E+00	1.42E+03
	Biogenic ⁽²⁾	7.42E+00	5.83E+00	6.27E+00	1.84E+00	2.15E+00	2.35E+01
	Land use and land use change	4.18E+00	1.67E+01	2.47E-03	1.75E-03	6.42E-05	2.08E+01
	Total	4.02E+02	6.85E+02	2.33E+02	1.40E+02	3.90E+00	1.46E+03
Acidification potential - mol H ⁺ eq.		2.68E-03	5.53E-03	5.18E-04	7.44E-04	4.06E-06	9.47E-03
Eutrophication potential, aquatic freshwater - g P eq.		1.87E-01	1.00E-01	1.67E-03	9.88E-05	1.48E-05	2.89E-01
Eutrophication potential, aquatic marine - g N eq.		2.24E+00	9.03E-01	1.88E-01	2.97E-01	5.20E-03	3.63E+00
Eutrophication potential, terrestrial - mol N eq.		9.58E-03	1.14E-02	1.93E-03	3.25E-03	1.89E-05	2.61E-02
Photochemical ozone creation potential - g NMVOC eq.		1.52E+00	2.44E+00	5.52E-01	8.46E-01	5.70E-03	5.36E+00
Ozone depletion potential - g CFC 11 eq.		7.39E-05	4.68E-05	4.72E-05	3.13E-05	7.32E-08	1.99E-04
Abiotic depletion potential for minerals and metals ⁽³⁾ - g Sb eq.		1.54E-04	1.60E-02	2.87E-06	5.82E-06	5.01E-08	1.62E-02
Abiotic depletion potential for fossil resources ⁽³⁾ - MJ net calorific value		5.71E+00	9.53E+00	3.51E+00	1.83E+00	4.98E-03	2.06E+01
Water deprivation potential ⁽³⁾ - m ³ world eq. deprived		2.82E+00	3.15E-01	2.02E-01	-1.57E-04	1.29E-04	3.34E+00

(1) The biomasses transformed into the product are not considered.

(2) The biogenic contribution to Global Warming Potential refers only to biogenic methane. The contribution given by biogenic CO₂ is equal to zero, since the absorbed amount is equal to the emitted biogenic CO₂ within the reference 100 years period.

(3) The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator.

10. PRODUCT ENVIRONMENTAL PERFORMANCE



Compared to the last EPD, in this section the Water Deprivation indicator, reported here as “Water Scarcity Footprint” has substituted the Virtual Water Content, previously reported, to improve coherence with the indicators section.
Ecological footprint is not reported anymore.

11. DIFFERENCES VERSUS PREVIOUS VERSIONS OF EPD

The differences versus previous EPD versions are due to:

- the update of primary data on tomato cultivation and tomato semifinished products production.
- the use of updated emission factors for the energy mixes
- updated recipes of the product
- the implementation of GPI 4.0 requirements
- the implementation of Version 2 of the default list of environmental performance indicators (optional indicators were not analysed nor reported)

- the removal of the analysis for the 200 gr format, which is not produced and sold anymore

- the product Environmental performances section has been modified with the substitution of Virtual Water Content with Water Deprivation indicator and the removal of Ecological Footprint indicator.

Moreover, in this EPD only the results for Arrabbiata Sauce distributed in Italy are reported, while for products exported worldwide (except Italy) a new EPD has been developed.

12. REFERENCES

- International EPD Consortium, General Programme Instructions (EPD), ver. 4.0 of 2021-03-29;
- WWF, Global Footprint Network, Zoological Society of London, Living Planet Report 2008, WWF (2008);
- PCR 2010:19 CPC 23995: Sauces; ver. 4.0 of 2022-10-19;
- CONAI Report, relazione sulla gestione e Bilancio, 2020
- Eurostat database for waste management (2020)

Environmental declarations within the same product category but from different programmes may not be comparable.

Likewise EPDs based on different versions of PCRs, GPIs and the default list of indicators at www.environdec.com may not be comparable.

This declaration and further information in regards are available at www.environdec.com

As EPD owner, Barilla has the sole ownership, liability and responsibility for the EPD.

EPD PROCESS CERTIFICATION

Product category Rules (PCR) 2010:19 SAUCES, MIXED CONDIMENTS
AND MUSTARD
CPC 23995 Sauces
PCR review conducted by:
Technical Committee of the International EPD® system.
Chair Maurizio Fieschi
Contact via info@environdec.com

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



EPD PROCESS CERTIFICATION

Independent verification of the declaration and data, according to ISO 14025:

- ☒ EPD process verification
- ☐ EPD verification- Third party verifier
- ☐ Pre-verified tool

PROCESS INTERNAL VERIFICATION

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

- ☒ Yes
- ☐ No

Third party verifier: CCPB SRL Viale Masini 36, 40126 Bologna. Accredited by: Accredia



Process internal verifier: **Ugo Pretato**, Approved by: The International EPD® System



CONTACTS

Barilla G. e R. Fratelli- Società per Azioni, via Mantova 166, 43122, Parma, Italy. www.barillagroup.com
For additional information relative to the activities of the Barilla Group or in regards to this environmental declaration, please contact:
Luca Ruini - luca.ruini@barilla.com



Technical support and grafic design: Life Cycle Engineering SpA - Italy www.lcengineering.eu



13. GLOSSARY

CARBON FOOTPRINT

A product carbon footprint is the total amount of greenhouse gases produced along the entire life cycle. It is expressed in equivalent mass of carbon dioxide (CO₂-eq). In agriculture a significant contribution is given by the emission of nitrous oxide (N₂O) due to the fertilizers use. It is also known as Global Warming Potential (GWP).

www.ipcc.ch

ACIDIFICATION POTENTIAL

It is a phenomenon for which precipitation is unusually acidic, meaning that it has substandard levels of pH. It can have harmful effects on plants, aquatic animals and infrastructure. Acid rain is caused by emissions of SO₂, NO_x and NH₃.

WATER DEPRIVATION POTENTIAL

Water deprivation measures the available water remaining per unit of surface in a given watershed relative to the world average, after human and aquatic ecosystem demands have been met. This method builds on the assumption that the potential to deprive another user of water is directly proportional to the amount of water consumed and inversely proportional to the available water remaining per unit of surface and time in a region (watershed).

www.wulca-waterlca.org

OZONE DEPLETION POTENTIAL

Degradation of the stratospheric layer of the ozone involved in blocking the UV component of sunrays. Depletion is due to particularly reactive components that originate from chlorofluorocarbon (CFC) or chlorofluoromethanes (CFM). The substance employed as benchmark measure for OPD is trichlorofluoromethane, or CFC-11.

EUTROPHICATION POTENTIAL

It is an abnormal proliferation of vegetation in the aquatic ecosystems caused by the addition of nutrients into rivers, lakes or marine water, which determinates a lack of oxygen. The eutrophication potential is mainly influenced by emission into water of phosphates and nitrates.

PHOTOCHEMICAL OZONE CREATION POTENTIAL (POCP)

Production of compounds that, under the light effect, are able to promote an oxidation reaction leading to ozone production in the troposphere. The indicator is mainly influenced by VOCs (Volatile organic compounds) is usually expressed in mass of VOCs equivalent (g NMVOC - equivalent).