



# Wasa Ragi, Original

## Environmental Product Declaration



The first EPD process certified in the Food industries



**Barilla**  
The Italian Food Company. Since 1877.



**REGISTRATION NUMBER**  
S-P-00239

**CPC CODE**  
234 BAKERY PRODUCTS  
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**PROGRAMME**  
The International  
EPD® System  
[www.environdec.com](http://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](http://www.environdec.com).*

# 1. Brand and product

## THE BRAND WASA

Founded in 1919 Wasa is the largest crispbread baker in the world. Using only a few simple ingredients the crispbreads are baked to deliver a distinctive crunch. Wasa has 2 bakeries, in Filipstad (Sweden) and Celle (Germany) and the products are sold in over 40 markets all over the world. Since 2018 Wasa is reducing, calculating and compensating its remaining emissions from field to shelf making it a 100% carbon compensated brand. In 1999 Wasa became part of the Barilla Group.

Read more at [www.wasa.com](http://www.wasa.com).

## PLANT AND PROCESS

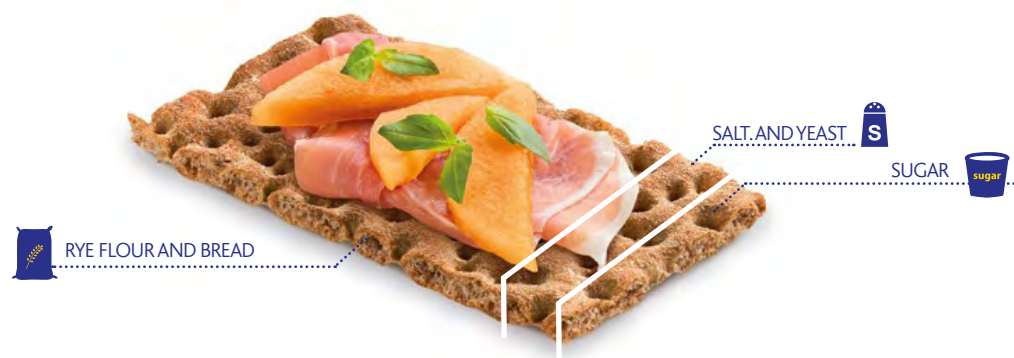
Wasa Rågi Original is baked in the Filipstad and Celle plants where a typical bakery process takes place and is sold in several countries with different names:

- Ragi in Sweden and Denmark
- Original mainly in Italy, Switzerland and Spain and more than thirty countries

The raw materials included in the recipe are mixed together into dough and baked in specific ovens. Following baking, the products are packaged and shipped to distribution centres for market entry. Rågi comes into 275 g and 550 g packaging format; and Original comes into 275 g packaging format; they are ready for consumption.

More info on [www.wasa.com](http://www.wasa.com).

## THE PRODUCT



NUTRITIONAL INFORMATION (per 100 g)		
Energy	kcal	334
	kJ	1 406
Fats <i>of which saturated</i>	grams	1.5 0.4
	grams	61.5 1.0
Carbohydrates <i>of which sugars</i>	grams	19
Fibres	grams	9
Proteins	grams	1
Salt	grams	

## 2. Barilla group



Passion for quality, continuous pursuit of excellent recipes and ability to combine tradition and innovation are the fundamental ingredients that have allowed a small shop of bread and pasta, opened in 1877 in Parma, to become an international player in the market of pasta, ready-to-eat sauces, baked goods and crispy breads.

The Group operates in over 100 countries through its brands, which have become the icon of excellence in the food sector, and with 30 production sites, which every year contribute to the production of over 2,099,000 tonnes of products.

With its brands - Barilla, Mulino Bianco, Pan di Stelle, Gran Cereale, Harrys, Pavesi, Wasa, Filiz, Yemina e Vesta, Misko, Voiello, Cucina Barilla, Catelli, Lancia, Tolerant and Pasta Evangelists – promotes a tasty, joyful and healthy diet, inspired by the Mediterranean diet and the Italian lifestyle.

Further information on [www.barillagroup.com](http://www.barillagroup.com)

### Pasta & Bakery Facilities



## Good for You, Good for the Planet



In order to make a concrete contribution to global challenges, over the years, Barilla has developed a thought enclosed in the Good for You, Good for the Planet Mission that guides, step by step and offers people good, safe, nutritionally balanced food, coming from responsible supply chains.

**GOOD FOOD** means taste, pleasure and a daily gesture of love for the people themselves.

**HEALTHY FOOD** means selected raw materials and balanced nutritional profiles to support healthy lifestyles.

**FOOD SOURCED FROM RESPONSIBLE SUPPLY CHAINS** means seeking the best ingredients to guarantee excellent quality, respectful of people, animals and the environment.

A commitment “from field to fork”, which has led to the development of initiatives in the various stages of the supply chain and for which all Barilla Group brands contribute through projects aiming to improve the nutritional profile of products, reinforce the sustainability of the production and supply chains and provide transparent communication to consumers.

# WASA A 100% CO<sub>2</sub> COMPENSATED BRAND

The Wasa brand has embarked on a path that has led to the achievement of **100% carbon compensation**, in line with its core values - love of Nature. Progressiveness and promoting a **healthy lifestyle** for present and future generations.

The path includes three steps: **measure**, **reduce** and **compensate**. The path was certified by DNV-GL following the International Standard PAS 2060.

This certification covers both Wasa brand and products.



## WE MEASURE

All the greenhouse gas emissions arising from Wasa brand activities (from field to shelf) are identified and measured, related to a baseline year (2017).

## WE REDUCE

Some measures are taken to reduce the greenhouse gases emissions, like Energy Saving Programs, Green Logistic Projects and purchasing renewable electricity (100% from hydropower sources).

## WE COMPENSATE

To compensate the remaining emissions, WASA has chosen to contribute to certified VCS projects. The VCS Program is the world's most widely used voluntary GHG program. Projects developed under the VCS Program must follow a rigorous assessment process in order to be certified. To know more about the projects see [www.wasa.com/global/sustainability](http://www.wasa.com/global/sustainability)





## 3. Environmental performance calculation



The Environmental performance of the product was calculated using the LCA (life cycle analysis) methodology, including the entire production chain, starting from the cultivation of the raw materials until the delivery of the finished product to the retailer.

The study was conducted following the specific product rules published for the EPD System: “CPC code 234 – Bakery products”.

The contribution to the environmental impacts brought by generic data is less than 10% in all impact categories.

### DECLARED UNIT

Data are referred to **1 kg** of product plus the related packaging (the packaging is referred to the **275 grams format**, reported to 1 kg of product).

### SYSTEM BOUNDARIES

The processes constituting the analyzed system were organized according to following three successive phases, in compliance with the EPD system’s requirements.



# 4. Raw materials production



## INGREDIENTS PRODUCTIONS

### CEREALS

Cereal cultivation performances are calculated on the basis of primary data, yield, energy consumption and fertiliser use for each cereal collected from farms. Cultivation region is Germany and Sweden, percentages are related to year 2020. Cultivation yield is calculated as average of years 2018, 2019 and 2020.



### OTHER INGREDIENTS

Data related to sugar production are primary and come from Barilla suppliers. Data from LCA databases are used for other materials in the recipe (yeast, salt and flavours).

# 5. Packaging and auxiliary materials production



## PRIMARY PACKAGING

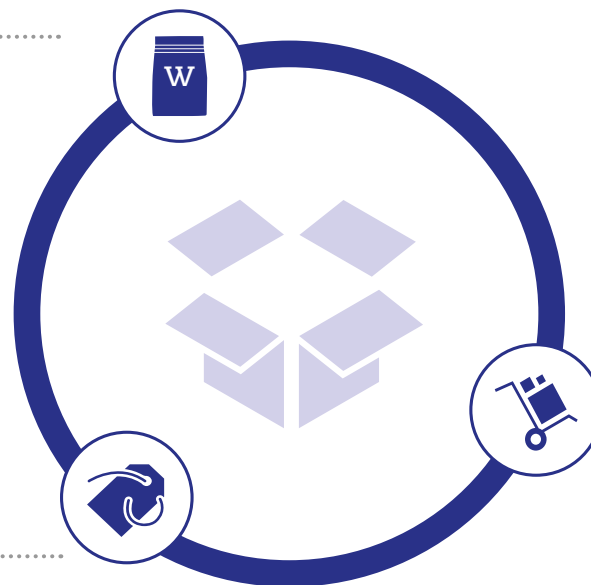
Packaging environmental performances are calculated using the 275 g format for Ragi Original, the most sold one, and reported per packaging used for 1 kg of product.

The primary packaging consists in a multilayer box (paper-based, with a thin plastic film), with a paper banderole.

Primary data (from packaging unit) are used for packaging amount and packaging materials production; data about packaging production process come from Barilla LCA database.

## AUXILIARY MATERIALS PRODUCTION

Auxiliary materials environmental performances are evaluated by using primary data from plant, during 2020 year. Secondary data (Ecoinvent) are used for environmental aspects associated to materials production.



*Packaging used for WASA products is 100% designed for recycle.*



*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 TRANSPORT

The packaging for transport consists in cardboard boxes (american box), used for the distribution of the product, and a plastic extensible film. Boxes are made mainly by recycled cardboard carton (pre and post consumer). The data used have been collected by LCA database (mainly Ecoinvent).

# 6. Ragi Original production



## GENERAL INFORMATION

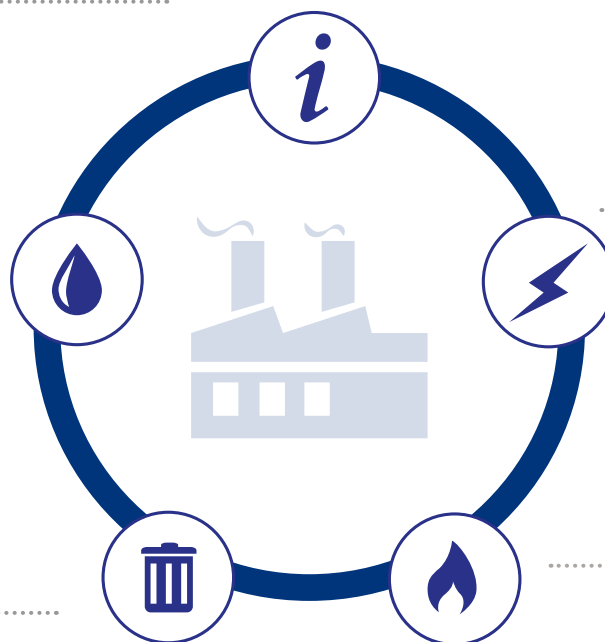
The environmental performances related to the production process are evaluated considering as primary data the energy and the water consumption and the waste production. Secondary data (mainly Ecoinvent) are used for the environmental aspects related to the production of energy and water. Two plants are considered in the analysis: Celle and Filipstad.

## WATER

The 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 dough preparation: this amount is included both in plant consumption and product recipe following a precautionary approach. Data are referred to year 2020.

## WASTE

The primary data are collected by the plant registrations. The overall value is attributed to the product using the mass allocation procedure. Data are referred to year 2020.



## RAGI ORIGINAL PRODUCTION

### ELECTRICITY

Total plants electricity has been divided using mass allocation (plants produce other products beyond Ragi Original). Barilla, through the GO certification system (Guaranty of origin market), buys energy from hydroelectric and wind renewable resources as to cover the entire WASA production. Filipstad plant has 100% electric oven for its bakery production. Data are referred to 2020.

### NATURAL GAS

The natural gas consumption is evaluated using primary data. The overall value is attributed to the product using the mass allocation procedure. Data are referred to year 2020.



# 7. Distribution



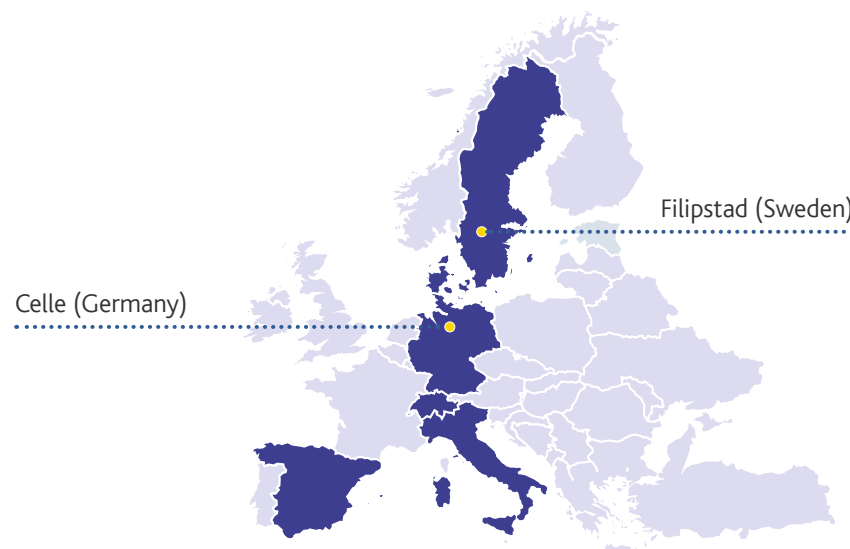
## DISTRIBUTION

Ragi is produced in Filipstad (Sweden) mostly distributed in Sweden (57%) and Denmark (43%). Distribution performance were calculated considering the transport for about 650 km by truck.

Original is produced in Celle (Germany) and Filipstad (Sweden) and distributed in more than thirty countries, among which mostly in Italy, Switzerland and Spain. Distribution performance were calculated considering the transport for about 1 951 km by truck and 285 km by ship.

The product does not need any particular storage condition (such as refrigeration).

The impacts related to the disposal of the packaging for transport have been calculated considering the scenario for paper board (presented in the following page), reference Eurostat 2017.



# 8. Packaging end of life - Ragi



## SWEDEN

Reference: Eurostat report 2017



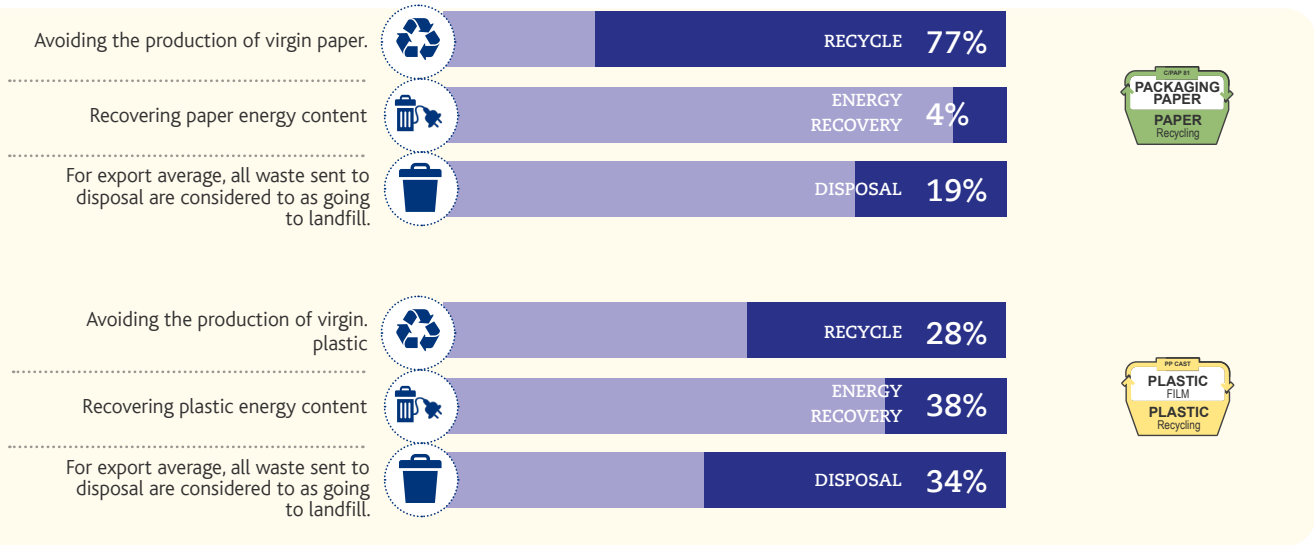
## DENMARK

Reference: Eurostat report 2017



Primary packaging is 100% recyclable in separated paper collection. Secondary packaging can be divided into plastic and paper components and can be recycled through the two separated collections presented above.













# 10. Packaging end of life - Original



Original distribution involves more than ten countries, without the prevalence of one of them. For this reason, here the average calculated scenario is reported.













Primary packaging is 100% recyclable in separated paper collection. Secondary packaging can be divided into plastic and paper components and can be recycled through the two separated collections presented above.

# 11. Environmental results - Ragi

 <b>USE OF RESOURCES</b> 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	1.85E+00	9.82E-01	1.15E+01	2.08E-03	8.15E-05	1.43E+01
	Used as raw materials*	0.00E+00	7.09E-01	0.00E+00	0.00E+00	0.00E+00	7.09E-01
	<b>Total</b>	<b>1.85E+00</b>	<b>1.69E+00</b>	<b>1.15E+01</b>	<b>2.08E-03</b>	<b>8.15E-05</b>	<b>1.50E+01</b>
PRIMARY ENERGY RESOURCES - NON RENEWABLE data in MJ	Used as energy carrier	5.02E+00	3.07E+00	4.56E-01	1.34E+00	1.57E-03	9.89E+00
	Used as raw materials	6.69E-06	2.82E-01	0.00E+00	0.00E+00	0.00E+00	2.82E-01
	<b>Total</b>	<b>5.02E+00</b>	<b>3.35E+00</b>	<b>4.56E-01</b>	<b>1.34E+00</b>	<b>1.57E-03</b>	<b>1.02E+01</b>
Secondary Material (g)		0.00E+00	3.45E+01	0.00E+00	0.00E+00	0.00E+00	3.45E+01
Renewable secondary fuels (MJ. net calorific power)		0.00E+00	2.06E-02	0.00E+00	0.00E+00	0.00E+00	2.06E-02
Non-renewable secondary fuels (MJ. net calorific power)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (liters)		1.48E+01	2.49E+00	9.00E+01	2.84E-02	1.63E-03	1.07E+02
 <b>OUTPUT FLOWS</b> 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	
Waste to animal feed or similar (g)		0.00E+00	0.00E+00	1.20E-02	0.00E+00	0.00E+00	1.20E-02
Components for reuse (g)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (g)		2.82E+01	8.51E+00	4.10E+02	2.89E+01	3.77E+01	5.14E+02
Materials for energy recovery (g)		6.21E+00	0.00E+00	9.04E+01	0.00E+00	0.00E+00	9.66E+01
Exported energy, electricity (MJ)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal (MJ)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Secondary energy resources and recovered energy flows do not show relevant contributions.

\*The biomasses transformed into the product are not considered.

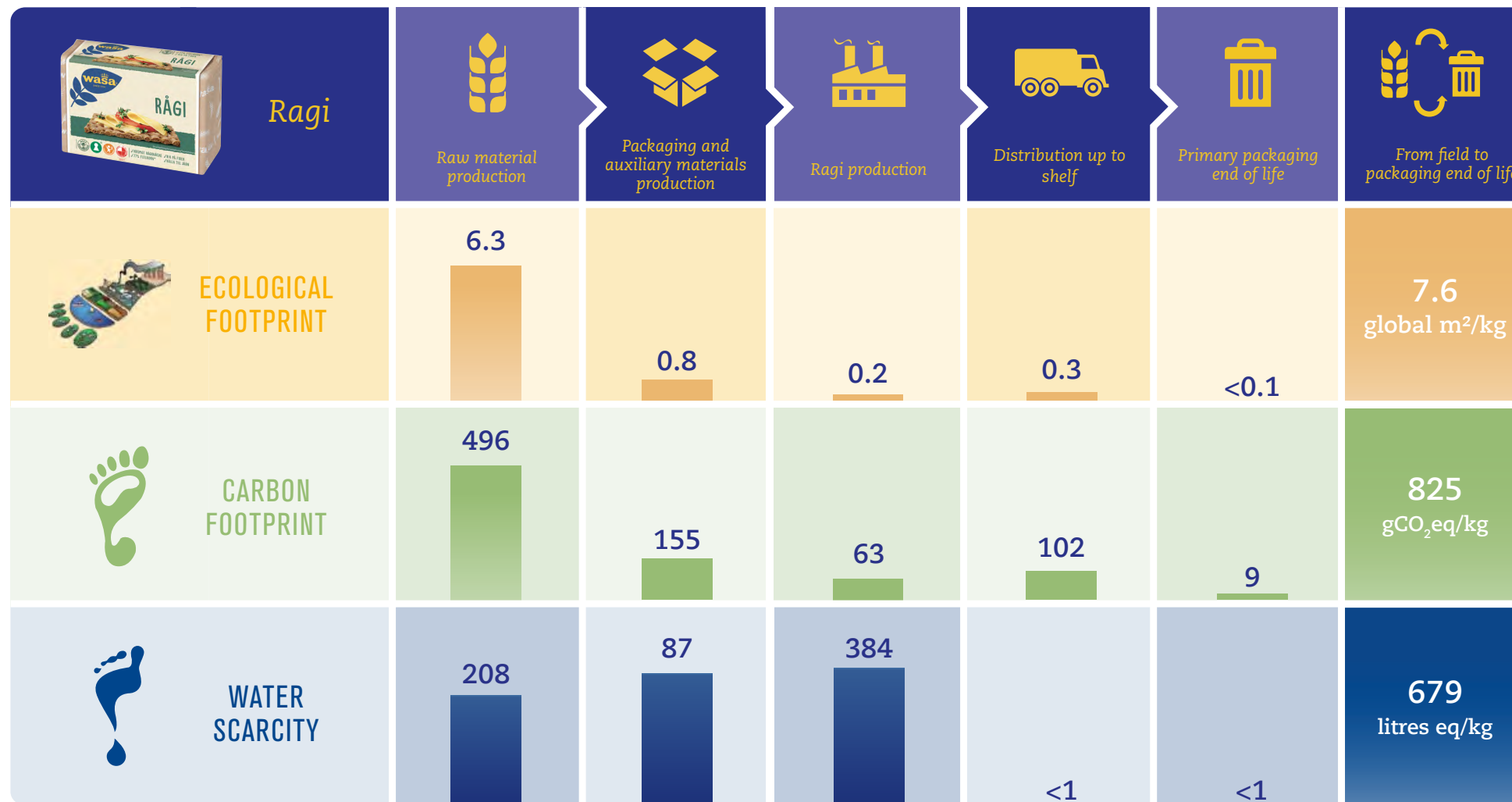
 <b>POTENTIAL ENVIRONMENTAL IMPACTS</b> data referred to 1 kg of product		UPSTREAM		CORE	DOWNSTREAM		TOTAL
		 Raw material production	 Packaging and auxiliary materials production	 Production	 Distribution up to shelf	 Primary packaging end of life	
GLOBAL WARMING POTENTIAL - GWP (g CO <sub>2</sub> eq)	Fossil	4.61E+02	1.54E+02	6.11E+01	9.63E+01	2.82E+00	7.74E+02
	Biogenic	2.12E+01	1.06E+00	2.09E+00	5.37E+00	6.45E+00	3.62E+01
	Land use and land transformation	1.45E+01	5.27E-01	7.24E-03	8.55E-04	1.02E-04	1.50E+01
	<b>Total</b>	<b>4.96E+02</b>	<b>1.55E+02</b>	<b>6.32E+01</b>	<b>1.02E+02</b>	<b>9.26E+00</b>	<b>8.25E+02</b>
Acidification Potential - g SO <sub>2</sub> eq.		5.97E+00	7.71E-01	9.02E-02	2.94E-01	1.69E-03	7.12E+00
Eutrophication Potential - g PO <sub>4</sub> <sup>3-</sup> eq.		4.14E+00	1.54E-01	2.76E-02	4.06E-02	3.52E-03	4.37E+00
Photochemical Oxidant Formation Potential - gNMVOC eq		1.44E+00	7.98E-01	8.03E-02	3.26E-01	3.66E-03	2.65E+00
Abiotic Depletion Potential - Elements g Sb eq.		2.46E-04	1.33E-05	1.92E-06	4.12E-06	2.11E-08	2.65E-04
Abiotic Depletion Potential - Fossil fuels - MJ, net calorific value		4.52E+00	2.99E+00	4.32E-01	1.34E+00	1.46E-03	9.28E+00
Water scarcity potential, m <sup>3</sup> eq.		2.08E-01	8.73E-02	3.84E-01	0.00E+00	6.16E-05	6.79E-01
 <b>WASTE PRODUCTION*</b> 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	
Hazardous waste disposed (g)		3.48E-05	8.93E-05	0.00E+00	0.00E+00	0.00E+00	1.2E-04
Non-Hazardous waste disposed (g)		6.19E-01	4.55E+00	0.00E+00	0.00E+00	0.00E+00	5.2E+00
Radioactive waste disposed (g)		5.88E-01	4.21E-01	4.04E-02	4.36E-02	1.59E-04	1.1E+00

The biogenic contribution to Global Warming Potential refers only to biogenic methane.  
 The contribution given by biogenic CO<sub>2</sub> is equal to zero, since the absorbed amount is equal to the emitted biogenic CO<sub>2</sub> within the reference 100 years period.

\*Non-zero values indicate waste flows to disposal whose treatment impact isn't evaluated within system boundaries (usually they come from secondary data used in calculation model).  
 Zero values indicate that – even if some waste are produced and disposed – their impact is evaluated within the system boundaries.















## PRODUCT ENVIRONMENTAL PERFORMANCES















Compared to the last EPD, in this section the Water Scarcity indicator has substituted the Virtual Water Content, previously reported, to improve coherence with the indicators section.

## 12. Environmental results - Original

 <b>USE OF RESOURCES</b> 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	1.85E+00	9.82E-01	1.10E+01	6.21E-03	1.40E-04	1.38E+01
	Used as raw materials*	0.00E+00	7.09E-01	0.00E+00	0.00E+00	0.00E+00	7.09E-01
	<b>Total</b>	<b>1.85E+00</b>	<b>1.69E+00</b>	<b>1.10E+01</b>	<b>6.21E-03</b>	<b>1.40E-04</b>	<b>1.45E+01</b>
PRIMARY ENERGY RESOURCES - NON RENEWABLE data in MJ	Used as energy carrier	5.02E+00	3.07E+00	8.05E-01	4.05E+00	2.49E-03	1.30E+01
	Used as raw materials	6.69E-06	2.82E-01	0.00E+00	0.00E+00	0.00E+00	2.82E-01
	<b>Total</b>	<b>5.02E+00</b>	<b>3.35E+00</b>	<b>8.05E-01</b>	<b>4.05E+00</b>	<b>2.49E-03</b>	<b>1.32E+01</b>
Secondary Material (g)		0.00E+00	3.45E+01	0.00E+00	0.00E+00	0.00E+00	3.45E+01
Renewable secondary fuels (MJ. net calorific power)		0.00E+00	2.06E-02	0.00E+00	0.00E+00	0.00E+00	2.06E-02
Non-renewable secondary fuels (MJ. net calorific power)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (liters)		1.48E+01	2.50E+00	8.21E+01	8.32E-02	1.70E-03	9.95E+01
 <b>OUTPUT FLOWS</b> 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	
Waste to animal feed or similar (g)		0.00E+00	0.00E+00	1.20E-02	0.00E+00	0.00E+00	1.20E-02
Components for reuse (g)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (g)		2.82E+01	8.51E+00	3.90E+02	2.63E+01	3.35E+01	4.87E+02
Materials for energy recovery (g)		6.21E+00	0.00E+00	8.33E+01	0.00E+00	0.00E+00	8.95E+01
Exported energy, electricity (MJ)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal (MJ)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Secondary energy resources and recovered energy flows do not show relevant contributions.

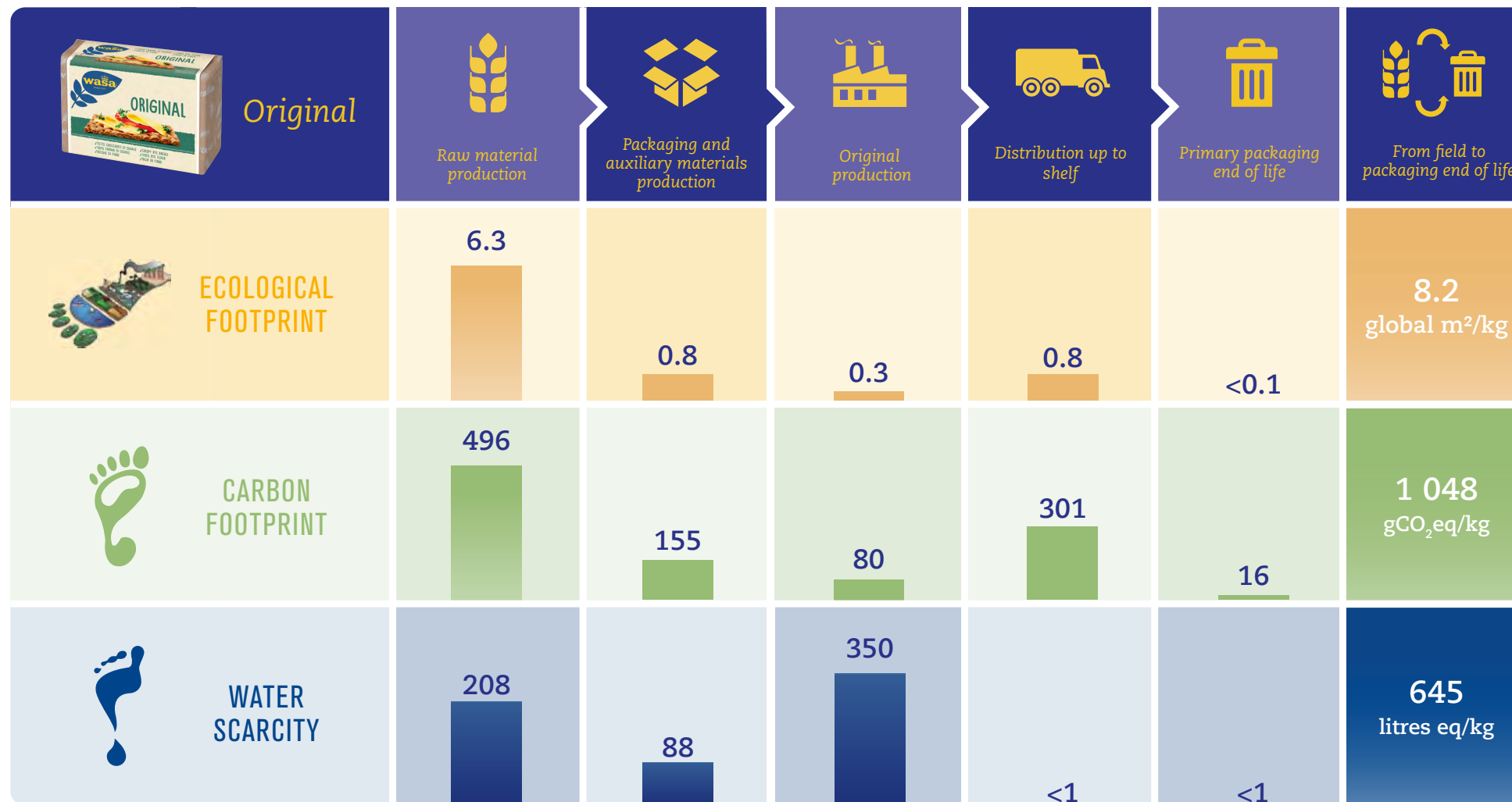
\*The biomasses transformed into the product are not considered.

 <b>POTENTIAL ENVIRONMENTAL IMPACTS</b> 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 <sub>2</sub> eq)	Fossil	4.61E+02	1.54E+02	7.77E+01	2.91E+02	4.04E+00	9.87E+02
	Biogenic	2.12E+01	1.07E+00	1.92E+00	9.88E+00	1.18E+01	4.59E+01
	Land use and land transformation	1.45E+01	5.92E-01	6.90E-03	2.49E-03	1.78E-04	1.51E+01
	<b>Total</b>	<b>4.96E+02</b>	<b>1.55E+02</b>	<b>7.97E+01</b>	<b>3.01E+02</b>	<b>1.59E+01</b>	<b>1.05E+03</b>
Acidification Potential - g SO <sub>2</sub> eq.		5.97E+00	7.72E-01	1.06E-01	9.50E-01	2.69E-03	7.80E+00
Eutrophication Potential - g PO <sub>4</sub> <sup>3-</sup> eq.		4.14E+00	1.55E-01	2.92E-02	1.24E-01	6.34E-03	4.46E+00
Photochemical Oxidant Formation Potential - gNMVOC eq		1.44E+00	7.98E-01	9.96E-02	1.02E+00	6.16E-03	3.37E+00
Abiotic Depletion Potential - Elements g Sb eq.		2.46E-04	1.34E-05	1.86E-06	1.24E-05	2.48E-08	2.73E-04
Abiotic Depletion Potential - Fossil fuels - MJ, net calorific value		4.52E+00	2.99E+00	7.81E-01	4.05E+00	2.29E-03	1.23E+01
Water scarcity potential, m <sup>3</sup> eq.		2.08E-01	8.75E-02	3.50E-01	-8.50E-04	6.08E-05	6.45E-01
 <b>WASTE PRODUCTION*</b> 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	
Hazardous waste disposed (g)		3.48E-05	8.93E-05	0.00E+00	0.00E+00	0.00E+00	1.2E-04
Non-Hazardous waste disposed (g)		6.19E-01	4.55E+00	0.00E+00	0.00E+00	0.00E+00	5.2E+00
Radioactive waste disposed (g)		5.88E-01	4.21E-01	3.96E-02	1.32E-01	2.76E-04	1.2E+00

The biogenic contribution to Global Warming Potential refers only to biogenic methane.  
 The contribution given by biogenic CO<sub>2</sub> is equal to zero, since the absorbed amount is equal to the emitted biogenic CO<sub>2</sub> within the reference 100 years period.

\*Non-zero values indicate waste flows to disposal whose treatment impact isn't evaluated within system boundaries (usually they come from secondary data used in calculation model).  
 Zero values indicate that – even if some waste are produced and disposed – their impact is evaluated within the system boundaries.

## PRODUCT ENVIRONMENTAL PERFORMANCES



Compared to the last EPD, in this section the Water Scarcity indicator has substituted the Virtual Water Content, previously reported, to improve coherence with the indicators section.

## 13. Difference versus previous versions of the EPD

The differences versus previous EPD versions are mainly due to the improved evaluation of scraps generated during the production process, the use of updated emission factors for the energy mixes, updated yields for soft wheat and rye cultivation calculated as average value of the last

three available years for every region. Moreover, the product Environmental performances section has been modified with the substitution of Virtual Water Content with Water Scarcity indicator.

## 14. Additional information

### REFERENCES

- International EPD Consortium, General Programme Instructions (EPD), ver. 3.01 of 18/09/2019;
- WWF, Global Footprint Network, Zoological Society of London, Living Planet Report 2008, WWF (2008);
- PCR 2012:06 CPC 234: Bakery Products; ver. 3.0 of 20/01/2020;
- Eurostat database for waste management, latest version (2017).



*Environmental declarations published within the same product category, though originating from different programs, may not be comparable. This declaration and further information in regards are available at [www.environdec.com](http://www.environdec.com)*



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

## EPD PROCESS CERTIFICATION

Product category Rules (PCR) review conducted by:  
Technical Committee of the International EPD® system.  
Chair Filippo Sessa  
Contact via [info@environdec.com](mailto:info@environdec.com)

Program operator:  
**EPD International AB**  
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[info@environdec.com](mailto: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

## PROCESS INTERNAL VERIFICATION

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

- Yes
- No

Third party verifier: Bureau Veritas Certification Sweden AB, Accredited by: SWEDAC



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



## CONTACTS

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Technical support and graphic design: Life Cycle Engineering SpA - Italy [www.lcengineering.eu](http://www.lcengineering.eu)



## 15. Glossary

### ECOLOGICAL FOOTPRINT

The ecological footprint measures the area of biologically productive land and water required to provide the resources used and absorb the carbon dioxide waste generated along the entire life cycle. It is measured in standard units called global hectares (gha).

[www.globalfootprint.org](http://www.globalfootprint.org)

### ACIDIFICATION (AP)

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 SO<sub>2</sub>, NO<sub>x</sub> and NH<sub>3</sub>. The acidification potential is measured in mass of sulphur dioxide equivalent (SO<sub>2</sub>-eq).

### 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 (CO<sub>2</sub>-eq). In agriculture a significant contribution is given by the emission of nitrous oxide (N<sub>2</sub>O) due to the fertilizers use. It is also known as Global Warming Potential (GWP).

[www.ipcc.ch](http://www.ipcc.ch)

### EUTROPHICATION (EP)

It is an abnormal proliferation of vegetation in the aquatic ecosystems caused by the addition of nutrients into rivers, lakes or ocean, which determines a lack of oxygen. The eutrophication potential is mainly influenced by emission into water of phosphates and nitrates. It is expressed in mass of PO<sub>4</sub><sup>-</sup>-equivalent.

### WATER SCARCITY

Water scarcity 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](http://www.wulca-waterlca.org)

### PHOTOCHEMICAL OXIDANT FORMATION POTENTIAL (POFP)

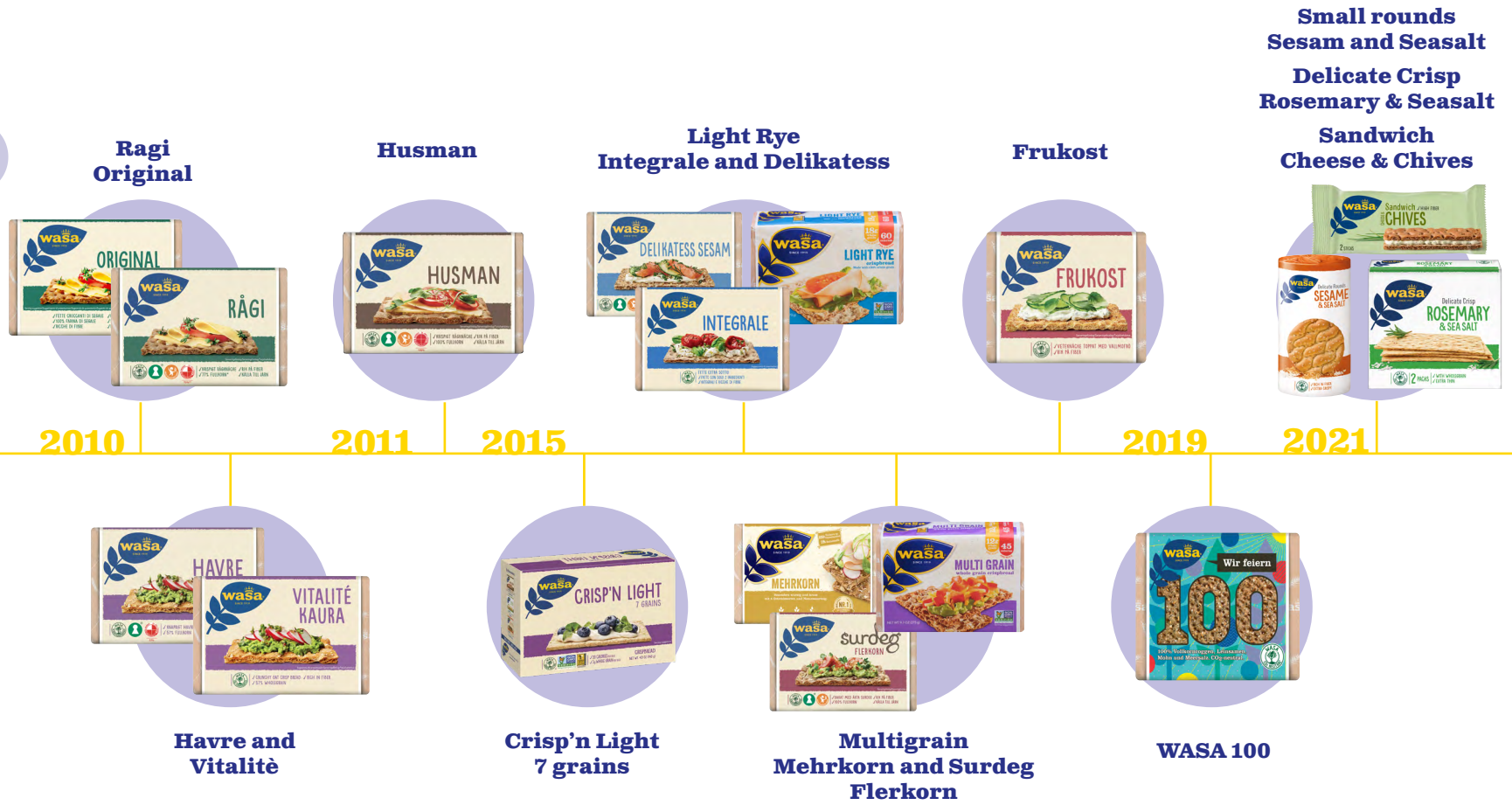
Production of compounds that, under the light effect, are able to promote an oxidation reaction leading to ozone production in the troposphere.

The indicator is mainly influenced by VOCs (Volatile organic compounds) is usually expressed in mass of VOCs equivalent (g NMVOC - equivalent).

# WASA Brand EPDs

**17**  
Wasa products covered by EPD

The year of the first EPD publication is reported



The number of products covered by EPD could vary on the base of the date of publication