Basalti Orvieto

BASALTI ORVIETO Srl

ENVIRONMENTAL PRODUCT DECLARATION

FARINA DI BASALTO® XF,XLIT,F-NTf, XM-NTm in BIG BAG

(average product)

Cornale Castel Viscardo (TR)

ITALY

In accordance with ISO 14025

Program Operator	EPDItaly
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Basalti Orvieto

GENERAL INFORMATION

EPD OWNER

Name of the company	Basalti Orvieto Srl con socio unico
Registered office	via Rocca di Corno, 49 67100 L'Aquila (AQ) ITALY
Contacts for information on the EPD	Gianluca Pizzuti g.pizzuti@basaltiorvieto.com

PROGRAM OPERATOR

EPDItaly	Via Gaetano De Castillia n° 10 - 20124 Milano, Italy

INFORMATION ON THE EPD

Product name (s)	Farina di Basalto® average product
Site (s)	Località Cornale snc, Castel Viscardo (TR)
Short description and technical information of the product (s)	Farina di Basalto® is a powder obtained from mechanical grinding of basalt rock.
Field of application of the product (s)	Farina di Basalto® average product, 1 ton packed in big bag. Products included: XF,XLIT,F-NTf,XM-NTm.
Product (s) reference standards (if any)	Regulation (EC) 834/2007 and Regulation (EC) 889/2008
CPC Code (number) https://unstats.un.org/unsd/classifications/Econ	15320 - Pebbles, gravel, broken or crushed stone, macadam; granules, chippings and powder of stone

VERIFICATION INFORMATION

PCR	PCR EPDItaly036 – Granulato e Micronizzato minerale da attività estrattiva v.0
EPDItaly Regulation	EPD Italy, 2023. REGOLAMENTO DEL PROGRAMMA EPDItaly (2023-10-30 v.6.0)
Project Report LCA	Neri E. et al., 2024. LCA Report "Project report per la certificazione EPD media della Farina di Basalto® di Basalti Orvieto Srl (big bag da 1t)" v.1 06/12/2024 INDACO2 srl.
Independent Verification	The PCR review was performed by Ing. Balazs Sàra, Ing. Luca Giacomello, Ing. Elena Benzoni. Independent verification of the declaration and data, carried out according to ISO 14025: 2010. ☐ Internal ☑ External Third party verification carried out by: ICMQ S.p.A., via Gaetano De Castillia n ° 10 - 20124 Milan, Italy. Accredited by Accredia.
Comparability	Environmental statements published within the same product category, but from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804: 2012 + A2: 2019.

Liability	The EPD Owner releases EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence. EPDItaly disclaims any responsibility for the information, data and results provided by the EPD Owner for life cycle assessment.

OTHER INFORMATION

Technical support	LCA developed by: INDACO$_2$ srl (INDicatori Ambientali e CO_2) via Roma 21B 53034 Colle Val d'Elsa (SI) - ITALY Website: www.indaco2.it Technical support for data monitoring by: TECNO ESG Srl Società benefit Riviera di Chiaia, 270, 80121, Napoli (ITALIA) www.tecnosrl.it

Company information

Description of the organization:

Basalti Orvieto S.r.l. operating since 1994 in the mining and processing of non-metallic minerals and deals with the extraction, processing and marketing of basalt, whose applications range from structural to ornamental construction as it is a strategic material for the construction, depending on the processing, of railway ballast, of aggregates for the packaging of draining and sound-absorbing bituminous conglomerate or for the creation of high-performance concrete, or for interior and exterior coatings.

Basalti Orvieto is a small enterprise operating with thirty years, experience in producing first-class aggregates for buildings and constructions sector, train railways ballast, packing of bituminous drainage conglomerate, s.m.a, slurry-seal, production of concrete.

Currently the Castel Viscardo ore quarry is active, with about 35 direct and indirect employees.

The material is extracted from a flow of Leucititic Tephrite (group of Basalts) on a front of about 35 meters. Furthermore, given the homogeneous characteristics of the structure, the stone is used for ornamental applications. Cultivation covers an area of about 35 ha, some of which have already been excavated and some to be excavated for a reserve in a bench of approximately 4,000,000 cubic meters. Inside the extraction site there is a plant for the production of ballast and aggregates. The production potential of the aforementioned plant is approximately 2,500 cubic meters / day.

The products deriving from the processing of basalt aggregates are also used in the industrial field for the production of reinforced coatings and compounds for all those applications where an important resistance to temperature or fire is required. Other use deal with automotive, such as reinforcement for polyester/epoxy based composites, for the manufacture of interior and exterior panels. Basalt is also applied in other industrial uses concerning wear materials such as clutches and brake pads.

The company has a photovoltaic system that meets about half electricity needs of the overall plant.

Name and location of production site: *Castel Viscardo quarry (TR)*

Fig. 1 *Basalti Orvieto quarry*

Product information

Product name: Farina di Basalto® XF, XLIT, F-NTf, XM-NTm (Basalto® flour XF, XLIT, F-NTf, XM-NTm), average product

Product identification and description: Basalti Orvieto, in the sector of studies dedicated to fillers, started in 2015 the experiments that led to the patent for the Farina di Basalto®, a line of agricultural products with a registered trademark put on the market in 2019 (www.farinadibasalto.it), which guarantee effective protection and nutrition of plants help restore soil fertility.

These products are classified as technical means of natural origin that improve and increase the natural resistance of plants against harmful organisms and abiotic damage. The experiments carried out on different types of crops have confirmed for the Basalt® Flour its properties in defense against various pathogens. The characteristics of the basalt allow for better nutrition for the plant and support for the various vegetative phases, including fruit ripening and growth, and this leads to a higher yield.

The micronized Basalt Flour is obtained through the mechanical grinding of the basalt from Basalti Orvieto quarry, with no minerals or other substances addition, nor using wash water.

The content of silicon, magnesium, iron and other elements in basalt helps plants in photosynthesis and promotes their protection and nutrition.

Type XF is a corroborant certified by the Italian Association of Organic Agriculture AIAB and can be used in organic farming (according to Regulation (EC) 834/2007 and Regulation (EC) 889/2008) as a valid alternative in integrated agriculture, in order to reduce the use of pesticides and synthetic fertilizers. Due to its fineness, the product is applied in water dispersion, sprayed with manual or mechanical nebulizer.

Type XLIT is for use in livestock production, acts through a buffering, capturing and humification effect. It slows the production of volatile gases, reduces gaseous components that have harmful effects on animal health. Its action and the content in macro and microelements to litter and sewage, turns these into a product rich in humic acids. Regular use of Basalt Flour substantially reduces unpleasant odours, counteracts the growth of parasites, bacteria and fungi carrying diseases on the legs, hooves and skin of animals.

Type F-Ntf (NutriTerra fine) is used for remineralisation in soil, with a remedial function. It is used for the restoration of mineral nutrients in the soil and for the correction of acidic pH, with particular efficiency in those soils depleted by years of invasive agricultural practices. It also acts as a support to the restructuring action by increasing the stability of the soil structure, thus the circulation of air inside it. It is therefore used successfully in order to remineralize soils and as a supplement in cultures of all kinds, making the use of fertilizers more efficient and helping the soil to retain moisture.

Type XM-NTm (NutriTerra medio) is used in soil with a remedial and remineralizing function. It restores or improves the characteristics of fertility, structure and soil quality, increases the stability of microporosity (for water storage) and macroporosity (for air circulation). It therefore stimulates a better physiological activity of the root systems.

The Farina di Basalto ® produced by Basalti Orvieto has a size of 50 µm (90%< 30µm).

The XF, XLIT, F-NTf and XM-NTm types (hereafter Farina di Basalto ®) can be obtained simultaneously by the same micronization process.

Fig. 2 Farina di *Basalto®*

UN CPC code: 15320 - Pebbles, gravel, broken or crushed stone, macadam; granules, chippings and powder of stone.

Geographical scope: Italy

Content declaration

The raw material is a basic rock of volcanic effusive nature containing naturally occurring mineral elements, such as silica, alumina, potassium and calcium. It does not contain free crystalline silica nor minerals containing asbestos. Tab.1 shows more details on the characteristics of the product.

Farina di Basalto® is subjected to careful and constant controls to ensure a quality standard complying with the applicable reference standards.

Tab.1 *Content declaration of Farina di Basalto®*

CHEMICAL-PHYSICAL CHARACTERISTICS		
Electrical conductivity (extract 2:1)	1.14	dS/m
pH	9 ± 0.5	-Log[H+]
Cation exchange capacity	9	meq/100g
Assimilable iron (As. Fe)	377	mg/Kg
Density	2.7	mg/ m3
Water solubility	not soluble in water	
Solid physical state	powdery	

Color	slightly grey	
Smell	not perceptible	
CHEMICAL COMPOSITION		
Silicon Oxide (SiO_2)	45 - 49	%
Aluminium Oxide (Al_2O_3)	20.5 – 25.6	%
Potassium Oxide (K_2O)	8 – 10	%
Iron oxides (Fe_2O_3)	5.2 – 8.5	%
Calcium oxides (CaO)	7.5 – 8.5	%
Magnesium Oxide (MgO)	1.9 – 2.6	%
Sodium Oxide (Na_2O)	2.2 – 4.9	%
SIZES (mm)		
XF	0-50 (50% <16µm)	µm
XLIT	0-200 (50% <40µm)	µm
F-NTf	0-1000 (50% <80µm)	µm
XM-NTm	0-2000 (25% <125 µm 50% <500 µm)	µm

None of the substances listed in the current version of the "Candidate List" European Regulation 1907/2006 / EC REACH (Registration, Evaluation, Authorization and restriction of chemicals) is included in the products marketed, concentrations higher than 0.1% by weight. The product is not subject to classification or labeling in accordance with Directive 67/548 / EC and EC Regulation no. 1272/2008 (CLP) and its updates, as it is considered an article/item and therefore beyond their application field.

Packaging

Distribution/consumer packaging: the product is packed in big bags containing 1t (i.e. 2kg of packaging PE for 1t of Farina di Basalto®).

LCA information

Time representativeness:	data refer to the year 2022
Type of EPD	From cradle to gate (upstream + core)
Database used:	EcoInvent Database v.3.10.
LCA software used:	SimaPro 9.6

The scope of the present Environmental Product Declaration is to assess potential environmental impact values for the Farina di Basalto® production based on the Life Cycle Assessment methodology and make them explicit. A description follows with details on declared unit, system boundaries, key assumptions and a flow chart describing the lifecycle stages of the product.

A comprehensive quantitative evaluation of environmental performances in the **Farina di Basalto® (XF, XLIT, F-NTf, XM-NTm)** production chain has been provided based on Life Cycle Assessment (LCA). The lifecycle includes all The main processes from the withdrawing of raw materials, to the basalt stone extraction, grinding, sifting and micronization processes.

Declared Unit

The Declared Unit (DU) is **1 t of Farina di Basalto® (XF, XLIT, F-NTf, XM-NTm) produced by Basalti Orvieto S.p.A. in Castel Viscardo site (TR - IT) in 2022 and packed in 1t big bags.**

Description of system boundaries

Based on a "from cradle to gate" and distribution approach, the **Farina di Basalto® (XF, XLIT, F-NTf, XM-NTm)** lifecycle system boundaries concern:

Upstream Process: it consists in the "from cradle to gate" set of processes that includes:

- production and transport of raw materials used (e.g. chemical products and components of explosives, detonators and fuses);
- production and transport of materials for packaging of raw materials (e.g. PVC, PE, cardboard box);
- production and transport of materials for packaging of final product (i.e. PE big bag);
- production of machineries components that are substituted for ordinary maintenance (annual or more frequent).
- transport of raw materials from the main suppliers to Basalti Orvieto srl;
- production of electricity, fuels (i.e. diesel and LPG) and water in the company; these consumptions include both quarry activities and micronization;

The use of energy (electricity, LPG and gasoline) and water were based on data reported in the company annual reports and allocated to the mass processed in each core phase.

Core process: it consists in processes within the production plant (from gate to gate) that includes:

- direct air emissions due to the use of fuel for vehicles and LPG;

- treatment of water used during the production process;
- end-of-life treatment of waste generated in core process.

The Core process is divided into the following sub-phases, useful for the choice of allocation criteria for materials and energy during the assessment:

1 – Basalt stone extraction: activities of tracking, perforation, explosive loading, explosion, disaggregation, material loading and transport to the processing plant. The stone blocks are partly sold and partly sent for primary crushing.

2 – First grinding: activities of grinding using grinders and conveyor belts. From this phase fraction 1 is obtained and sent to the next step.

3 – Second grinding: activities of grinding of fraction 1, using grinders and conveyor belts. From this phase fraction 2 is obtained and sent to the next step.

4 – Milling 1: fraction 2 is reduced in size using mills. From this phase fraction 3 is obtained and sent to the next step.

5 – Sifting 1: fraction 3 is sifted through the use of sifters. From this phase the fractions 4, 5, 6, and 7 are obtained. Fraction 5 is sent to the next step.

6 – Milling 2: fraction 5 is reduced in size using mills. From this phase fraction 8 is obtained and is sent to the next step.

7 – Sifting 2: the fraction 8 is reduced in size through the use of mills and selected by sifters according to grain size. From this phase the fractions 9, 10, 11, 12, 13, and 14 are obtained.

8 – Sifting 3: fraction 11 is sifted through the use of sifters. From this phase the 15, 16, and 17 are obtained.

9 – Micronization: part of fractions 15 and 16 are reduced in size by using specific mills obtaining fractions 21 (Farina XF), 22 (Farina XLIT), 23 (Farina F-NTf), 24, and 27 (Farina XM-NTm). This plant is able to process material having a granulomery between 2-5 mm. The flour is dried using a heat mixer.

Farina di Basalto® XF, XLIT, F-NTf and XM-NTm are obtained simultaneously by the same process.

10 – Packaging: Farina di Basalto® is packed in 1t big bags.

Waste from the production process, mainly explosive, detonator and fuses packaging (e.g. cardboard and PVC) are burned during explosions, then they were considered sent 100% incineration, also lubricant oil is treated as 100% incineration. Paper, paperboard, plastic, wood and machineries components are collected by specific companies and sent to recycling (100% recycling), exception made for packaging materials collected as municipal waste. Machinery tyres were considered sent 100% to landfill. Transport of waste to the waste plant was considered as 50km average distance. The wastewater treatment was also included.

The Downstream process is out of the system boundaries.

Figure 3 shows the flow chart and system boundaries diagram of the **Farina di Basalto®**, divided into Upstream and Core.

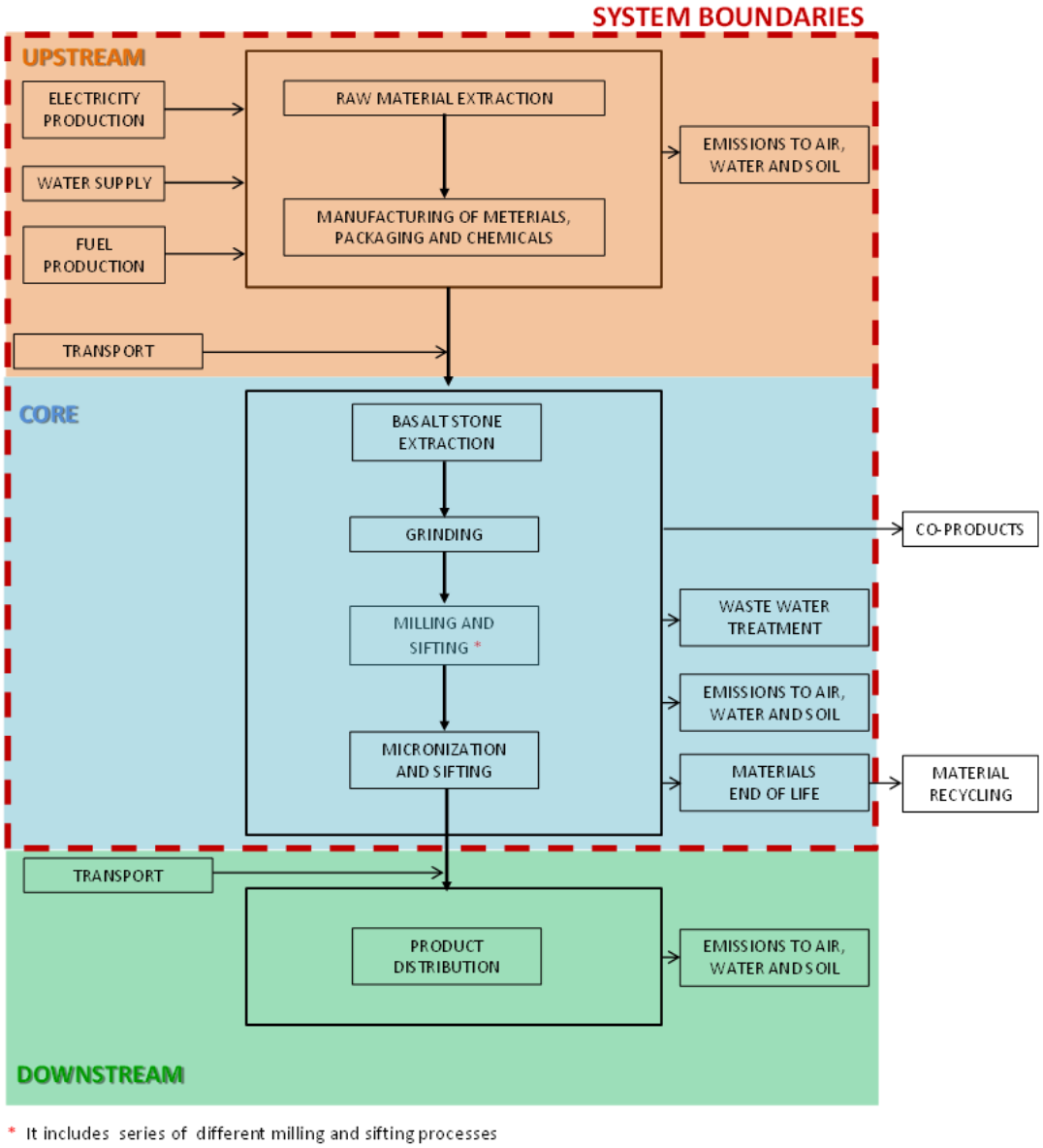

Fig.3 Flow chart and system boundaries of **Farina di Basalto®** production (red dotted box).

Excluded lifecycle stages: Based on the definition of system boundaries and cut-off criteria, a number of processes were considered not relevant or not directly referred to the **Farina di Basalto®** lifecycle.

Excluded processes are the following:

- construction of buildings and machineries used in the Castel Viscardo site;
- production and maintenance of machineries with more than 5 years estimated lifetime;
- activity and travels of employers;
- product secondary processing/blending with other materials
- use and end of life of the product
- long term emissions.

Not significant data were neglected. The considered cut-off is under the threshold of relevance (1% of total inputs), in accordance with the maximum percentage for exclusion.

More information

The LCA has been performed in compliance with ISO 14040:2021 e 14044:2021, ISO 14025:2006 (Environmental labels and declarations - Type III) and EPDItaly Programme Rule v.6.0.

The LCA refers to the PCR EPDItaly036 v.0 for "*Granulato e Micronizzato minerale da attività estrattiva*" UN CPC 1520 and 1532.

Primary data have been collected in the Basalti Orvieto production plant of Castel Viscardo (TR – IT) based on direct interviews with employers involved in production processes, during specific field-visits in different plant sections or derived from registered company reports. Quantity of spare parts for machinery maintenance are estimated, based on company reports and expert judgment. All quantities derive from primary data, as recommended by data quality requirements.

Environmental impacts due to the use of energy (electricity, LPG, gasoline), and water were based on data registered in company reports. The electricity consumption in each core sub-phase derives from direct monitoring carried out and documented by TECNO srl. Electricity used by the company is partly autoproduced by photovoltaic panels and partly supplied by the grid mix (modelled as residual mix, according to AIB,2023). The GWP-GHG of electricity mix of the company is 0.295 $kgCO_2/kWh$.

Selected generic data (secondary data) refer to the Ecoinvent database v.3.10.

The LCA has been performed based on the SimaPro 9.6 software, method EN 15804+A2, EF 3.1.

Impacts associated with proxy data not exceed 1% of the overall environmental impact from the product system. The environmental impacts totally derived from primary or selected generic data. All primary and selected generic data, database and accounting models are compliant with the data quality requirements.

An estimated quantity of about 3% of losses, relative to the raw material, along the production chain, are not included and considered not relevant for the assessment. Direct emissions (i.e. CO_2, CH_4 and N_2O) related to the use of gasoline and LPG are included in the core process. The LCA study was performed by Elena Neri, Gaia Esposito and Francesca Rossetti ($INDACO_2$ srl, Siena, Italy (Neri et al., 2024). It is an update with substantial modification to the pre-validated EPD (EPDItaly0240, 2022) and related project report (Neri et al., 2021), adopting the new published PCR EPDItaly036.

Environmental performance

Potential environmental impact

The assessed potential environmental impacts are reported in **table 2**, detailed into upstream, core and downstream processes. Values refer to the declared unit (**1 t of Farina di Basalto®**).

Tab.2 Environmental Impact Potentials referred to the **Farina di Basalto® (XF, XLIT, F-NTf, XM-NTm), average product,** production system per DU (2022).

IMPACT INDICATOR	UNIT	Upstream	Core	TOT
GWP-fossil	kg CO2 eq	5.75E+01	1.76E+01	7.51E+01
GWP-biogenic	kg CO2 eq	3.65E+00	2.33E-02	3.67E+00
GWP-luluc	kg CO2 eq	9.41E-03	4.25E-07	9.41E-03
GWP-total	kg CO2 eq	6.12E+01	1.76E+01	7.88E+01
AP	mol H+ eq	2.00E-01	2.03E-05	2.00E-01
EP-freshwater	kg P eq	1.03E-03	8.77E-08	1.03E-03
EP-marine	kg N eq	3.46E-02	1.08E-05	3.46E-02
EP-terrestrial	mol N eq	3.85E-01	6.51E-05	3.85E-01
POCP	kg NMVOC eq	2.19E-01	4.18E-05	2.19E-01
ODP	kg CFC11 eq	1.47E-06	1.36E-10	1.47E-06
ADP-mineral&metals*	kg Sb eq	2.12E-05	3.77E-10	2.12E-05
ADP-fossil*	MJ	1.17E+03	8.88E-02	1.17E+03
WDP*	m3 depriv.	1.50E+01	-6.48E-04	1.50E+01
(GWP – fossil) Global warming potential fossil fuels; (GWP – biogenic) Global warming potential biogenic; (GWP – luluc) Global warming potential land use and land use change; (GWP – total) Global warming potential total; (ODP) Depletion potential of stratospheric ozone layer; (AP) Acidification potential accumulated exceedance; (EP – freshwater) Eutrophication potential fraction of nutrients reaching freshwater end compartment; (EP – Marine) Eutrophication potential fraction of nutrients reaching marine end compartment; (EP – terrestrial) Eutrophication potential accumulated exceedance; (POCP) Formation potential of tropospheric ozone; (ADP – minerals&metals) Abiotic depletion potential for non-fossil resources; (ADP – fossil) Abiotic depletion potential for fossil resources; (WDP) Water (user) deprivation potential, deprivation-weighted water consumption				

** Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator*

Global Warming Potential: upstream processes generate the highest impact (78%), mainly due to the grid electricity consumption from grid (56%) and the production of big bag for product packaging (9%). The core phase generates 22% of the total impact due to direct emission from LPG (16%) and gasoline combustion (6%).

Acidification Potential: upstream processes generate the highest impact (99%), mainly due to the grid electricity consumption (64%), the production of big bag for product packaging (12%) and LPG production. The core phase generates impacts lower that 1%.

Eutrophication Potential: upstream processes generate the highest impact (99%), mainly due to the grid electricity consumption (64%), the production of big bag for product packaging (19%) and machinery maintenance (16%). The core phase generates impacts lower that 1%.

Photochemical Ozone Formation Potential: upstream processes generate the highest impact (99%), mainly due to the grid electricity consumption (49%), the production of LPG (20%) and big bag for product packaging (16%). The core phase generates impacts lower that 1%.

Results are summarized in **Figure 4.**

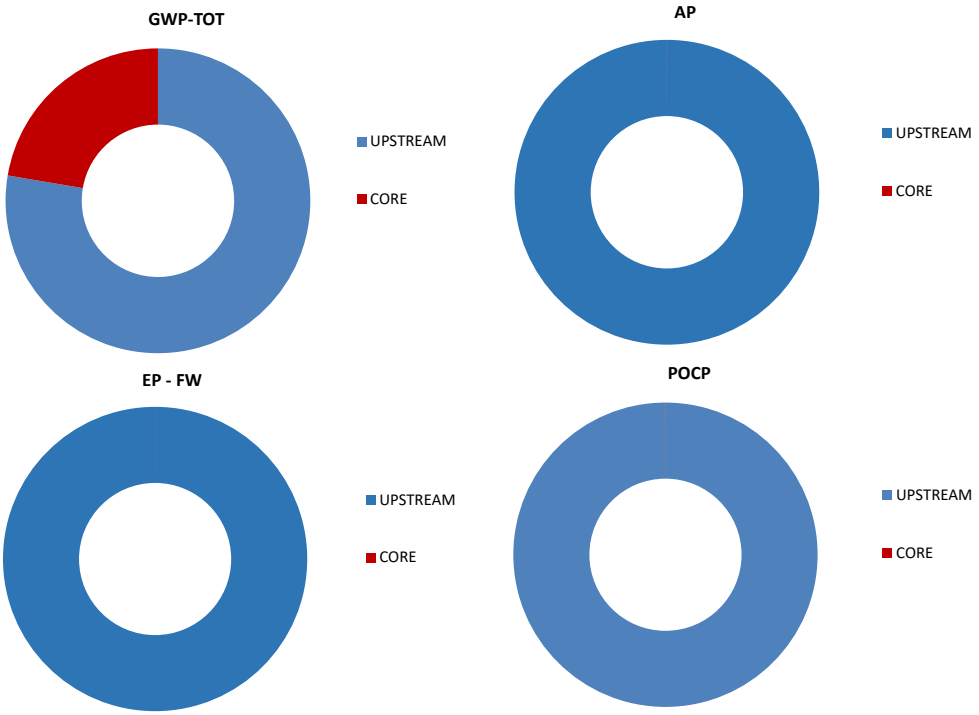

Fig. 4 LCA based estimated values of environmental impacts of **1 t of Farina di Basalto®**

Results highlight that grid electricity consumption is the most relevant aspect in terms of environmental impact management, particularly referring to GWP, AP, EP and POCP categories. The revealed hotspots constitute the starting point to identify and develop solutions to mitigate impacts and optimizing the whole process, for a continuous improvement on company management.

Neverless, the assessment allowed to highlight the best practices implemented by the company. The use of self-produced electricity from photovoltaic panels avoids about 65% of the total emissions (i.e. 50 kg CO_2 eq per DU) if compared with the same production process with electricity totally from national mix (residual mix). Ongoing monitoring and constant renewal of the vehicles, privileging the most efficient technologies, minimised the consumption (and consequently the impact) of fuels. Furthermore, the impact of LPG for drying is reduced by natural sun-drying of the product, when it is possible. Water consumption (and related impact) is also minimised by using it only when strictly necessary (i.e. limited to dust removal, avoiding the use of settling with flocculants).

Use of resources

Tab.3 Total renewable and non-renewable resources used in the **Farina di Basalto®** production system (2022)

PARAMETER		UNIT	Upstream	Core	TOTAL
Primary energy resources – Renewable	**Use as energy carrier**	MJ, net calorific value	4.17E+01	3.16E+02	3.58E+02
	Used as raw materials	MJ, net calorific value	2.06E+01	1.77E-04	2.06E+01
	TOTAL	MJ, net calorific value	6.23E+01	3.16E+02	3.79E+02
Primary energy resources – Non-renewable	**Use as energy carrier**	MJ, net calorific value	1.07E+03	8.88E-02	1.07E+03
	Used as raw materials	MJ, net calorific value	9.97E+01	0.00E+00	9.97E+01
	TOTAL	MJ, net calorific value	1.17E+03	8.88E-02	1.17E+03
Secondary material		kg	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0
Net use of fresh water		m^3	3.63E-01	-2.62E-06	3.63E-01

Waste production and output flows

Waste production

Tab.4 Total waste generation for the **Farina di Basalto®** production system (2022)

PARAMETER	UNIT	Upstream	Core	TOTAL
Hazardous waste disposed	kg	7.65E-03	6.79E-07	7.65E-03
Non-hazardous waste disposed	kg	2.24E-01	9.69E-03	2.33E-01
Radioactive waste disposed	kg	6.54E-04	1.90E-08	6.54E-04

Output flows

Tab.5 Total output flows for the **Farina di Basalto®** production system (2022)

PARAMETER	UNIT	Upstream	Core	TOTAL
Components for reuse	kg	0	0	0
Material for recycling	kg	0	3.06E-03	3.06E-03
Materials for energy recovery	kg	0	0	0
Exported energy, electricity	MJ	0	1.18E-02	1.18E-02
Exported energy, thermal	MJ	0	6.45E-02	6.45E-02

Additional parameters on resource use

Tab.6 Total amount of extracted rock needed for the production of 1t (UD) of **Farina di Basalto®** (2022)

PARAMETER	UNIT	Quantity
Basalt rock per UD	t	1.03

Additional Environmental Information

Basalti Orvieto Management, is commitment to keep its ISO 14001: 2015 Environmental Management System updated, and is determined to continuously improve.

To achieve this goal, the organization is constantly committed to:

• Ensure compliance with the legislation and regulations of applicable prescriptions and obligations;

• Evaluate and monitor all direct or indirect effects produced on the environment, during the operation activities, and set up improvement actions aimed at reducing the most significant impacts;

• Take action to make current and potential customers, as well as the community, aware of the company's commitment to the environment;

• Set up actions, aimed at the continuous improvement of their environmental performances and pollution prevention;

• Define actions that guarantee periodic verification of environmental requirements;

• Ensure the resources availability needed to achieve the defined objectives and goals, relating to pollution prevention;

• Ensure particular attention in qualifying and evaluating suppliers, so to guarantee continuity of services / supplies and compliance with mandatory regulations;

• Initiate all necessary actions to pursue energy saving and an optimized use of raw materials, aimed at a continuous improvement of all environmental and service delivery performances;

• Timely review external and internal context, the risks and opportunities and the environmental aspects related to the activities, and the expectations of the involved parties.

Desiring to ensure its tenacious commitment, the Management involves all staff, asking to all a collaborative contribution, so to achieve the present and future objectives, that will represent a qualitative and performance improvement, for the entire Organization.

Glossary

Biogenic carbon: carbon which is contained in biomass [ISO 14067:2018]

Biogenic carbon dioxide (CO_2): CO_2 obtained by the oxidation of biogenic carbon [ISO 14067:2018]

Carbon dioxide equivalent (CO_2 equivalent): unit for comparing the radiative forcing of a greenhouse gas to carbon dioxide. The carbon dioxide equivalent is calculated using the mass of a given greenhouse gas multiplied by its global warming potential [ISO 14064:2020]

Carbon footprint: net amount of greenhouse gas emissions and greenhouse gas removals, expressed in carbon dioxide (CO_2) equivalents. The CO_2 equivalent is calculated using the mass of a given greenhouse gas multiplied by its global warming potential. [ISO 14067:2018]

Functional/declared unit: quantified performance of a product system for use as a reference unit [ISO 14040:2021]

Global warming potential (GWP): factor describing the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time [ISO 14064:2021]

Life cycle assessment (LCA): compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle [ISO 14040:2021]

Raw material: primary or secondary material that is used to produce a product. Secondary material includes recycled material. [ISO 14040:2021]

Contact information

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LCA author:	$INDACO_2$ srl Via Roma 21B IT 53034 Colle Val d'Elsa (Siena) www.indaco2.it Elena Neri – elena.neri@indaco2.it T/ +39 3471137901

References

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