SAINT-GOBAIN

EPD®

ENVIRONMENTAL PRODUCT DECLARATION

ECO PLATFORM EPD VERIFIED

EPD VERIFIED

The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

Pipe system Natural DN600

In accordance with EN 15804:2012+A2:2019 and ISO 14025:2006

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PAM SAINT-GOBAIN

General information

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Programme:	The International EPD® System
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
Product category rules (PCR): PCR 2019:14 Construction products, version 1.11	
PCR review was conducted by the Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact	
Independent third-party verification of the declaration and data, according to ISO 14025:2006 ☐ EPD process certification ☒ EPD verification	
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Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No	

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Purpose of the document

As part of its commitment to sustainable development, Saint-Gobain PAM produces and publishes the Environmental Product Declaration (EPD) of its products according to the program "The International EPD© System", and thus provides the user environmental information, determined by Life Cycle Assessment (LCA). The intended use of the EPD is for B2B communication.

This "cradle-to-grave" EPD contains environmental information for all stages of the product life cycle, and also includes the optional module "benefits and loads beyond the product system boundary" (module D).
The EPD complies with EN 15804:2012+A2:2019 and ISO 14025:2006.

Foreword about document use

Data contained in the EPD is provided under the responsibility of Saint-Gobain PAM, producer of the EPD, according to the standards above. Any total or partial use of the information provided in this document must at least be accompanied by the complete reference of the original EPD and its producer.

To be comparable, information within the EPD must comply with standard EN 15804:2012+A2:2019, which defines in particular in § 5.3 "Comparability of EPD for construction products" the conditions under which construction products can be compared, on the basis of information provided by the EPD: **comparison of the environmental performance of construction products using the EPD information shall be based on the product's use in and its impacts on the building, and shall consider the complete life cycle (all information modules).**
The standard also specifies that **"comparison is possible"** provided that the products have **"the same functional requirements"**. **Technical performance of compared products**, i.e. safety factor in relation to the functional requirements, **are therefore not necessarily the same.**
EPD within the same product category from different programs may not be comparable.

Description of functional unit

The functional unit (FU), which is the unit LCA relates is:

"Conveying water over 1 m of pipe system Natural DN600, which complies with EN545:2010, at hydraulic pressure of 30 bars during 100 years".

Product information

Name of product: pipe system Natural DN600, CPC code 41292

Reference standards: EN 545 and ISO 2531

Product description:
Products are used for the supply and distribution of drinking and raw water. It can be manufactured with alternative coating, depending on conditions of installation and use.
Life cycle assessment concerns pipe system comprised of pipes, fittings and accessories.

NATURAL pipe

Example of NATURAL range fitting

Standard gasket

Main characteristics of pipe:

- Mass: 150.6 kg / FU
- Ductile iron / Minimum tensile strength (Rm): 420 MPa / Minimum elongation after fracture: 10%
- Barrel thickness designed with safety factor of 3
- Minimum diametrical stiffness: 26 kN/m^2
- Internal coating (lining):
  - sulphate resisting centrifuged blast furnace cement mortar
  - or PUR: polyurethane (alternative)
- External coating:
  - BioZinalium: layer of zinc-aluminium 85/15 alloy, enriched with copper (minimum surface density of 400g/m²), covered with acrylic paint (Aquacoat)
  - or TT PE: BioZinalium coating overlaid with polyethylene (alternative)
  - or TT PUX: polyurethane (alternative)
- Joint: Standard (flexible joint)
- Packaging: dunnage and caps

Allowable operating pressure (PFA) of pipe system is 30 bars. All performance tests of pipe system have been performed according to EN 545 and ISO 2531, including 50 bars leak tightness test.

During the life cycle of the product any hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has not been used in a percentage higher than 0.1% of the weight of the product.

Product components	Weight-kg	Post-consumer material, weight-%	Renewable material, weight-%
Body / Ductile iron	126.7	40 %	0 %
Lining / Blast furnace cement mortar	22.5	0 %	0 %
Coating / BioZinalium	1.0	0 %	0 %
Gasket / EPDM	< 1	0 %	0 %
TOTAL	150.6	34 %	0 %
Packaging materials	**Weight-kg**	**Weight-% (versus the product)**	
Dunnage	1 - 2	1 - 2 %	
Caps	< 1	< 1 %	
TOTAL	1 - 2	1 - 2 %	

Information on biogenic carbon content

As the mass of biogenic carbon containing materials in the product is less than 5 % of the mass of the product, the declaration of biogenic carbon content may be omitted and is not declared in the document.

Packaging includes wood (dunnage). Biogenic carbon content is declared in the table hereunder.

Biogenic carbon content	0.88 kg C / FU

Description of reference service life

Reference service life	100 years at minimum
Declared properties of the product (at factory gate) and finishes	Complies with EN 545:2010 and ISO 2531:2009
Theoretical application parameters, including references to appropriate practice and application codes.	Complies with EN 805, EN545:2010 Annex F and installation according to PAM recommendations
Assumed quality of the work, when the installation is in accordance with the manufacturer's instructions	Complies with EN 805, EN545:2010 Annex F and installation according to PAM recommendations
Environment outside pipe system	Complies with Annex D.2.2 of EN545:2010
Environment inside pipe system	Complies with Annex E of EN545:2010
Conditions of use	Compliance with the allowable operating pressure and with allowable covering heights for installation
Maintenance, e.g. required, type and quality and replacement of replaceable components	No maintenance required

Information regarding life cycle assessment

Functional unit (FU)	See “Description of functional unit” section
System boundary	“Cradle to grave and module D (A + B +C +D)”
Reference service life	100 years / See “Description of reference service life” section
Geographical scope Temporal scope Global scope	Production plants - Europe - 2019
Cut-off rules	The following processes have been excluded: . Manufacture of equipment used in production, building or any other capital goods . Transportation of personnel to the plant . Transportation of personnel within the plant . Research and development activities . Long-term emissions A maximum of 5% of total quantity of material and energy used per module A maximum of 1% of total quantity of material and energy used during full life cycle Polluter payer principle and modularity principle are followed
Allocations procedures	Physical allocation based on mass. Three plants
Data quality	A maximum of 10% of variability found on inventory data
Software & Databases	Software: GaBi 10.6 thinkstep thinkstep AG Leinfelden-Echterdingen GaBi Software System and Database for Life Cycle Engineering 1992-2020 © thinkstep AG. All rights reserved. With special acknowledgment: Institute for Acoustics and Building Physics (IABP) University of Stuttgart Internal data source: consumptions and direct emissions of plants External data sources: GaBi 10.6 (2022) & Ecoinvent 3.7 (2021) Characterization: CML
References	ISO 14040 and ISO 14044 ISO 14025 EN 15804 + A2 LCA project report, required for third-party verification

Life cycle stages

Following stages are assessed in the LCA:

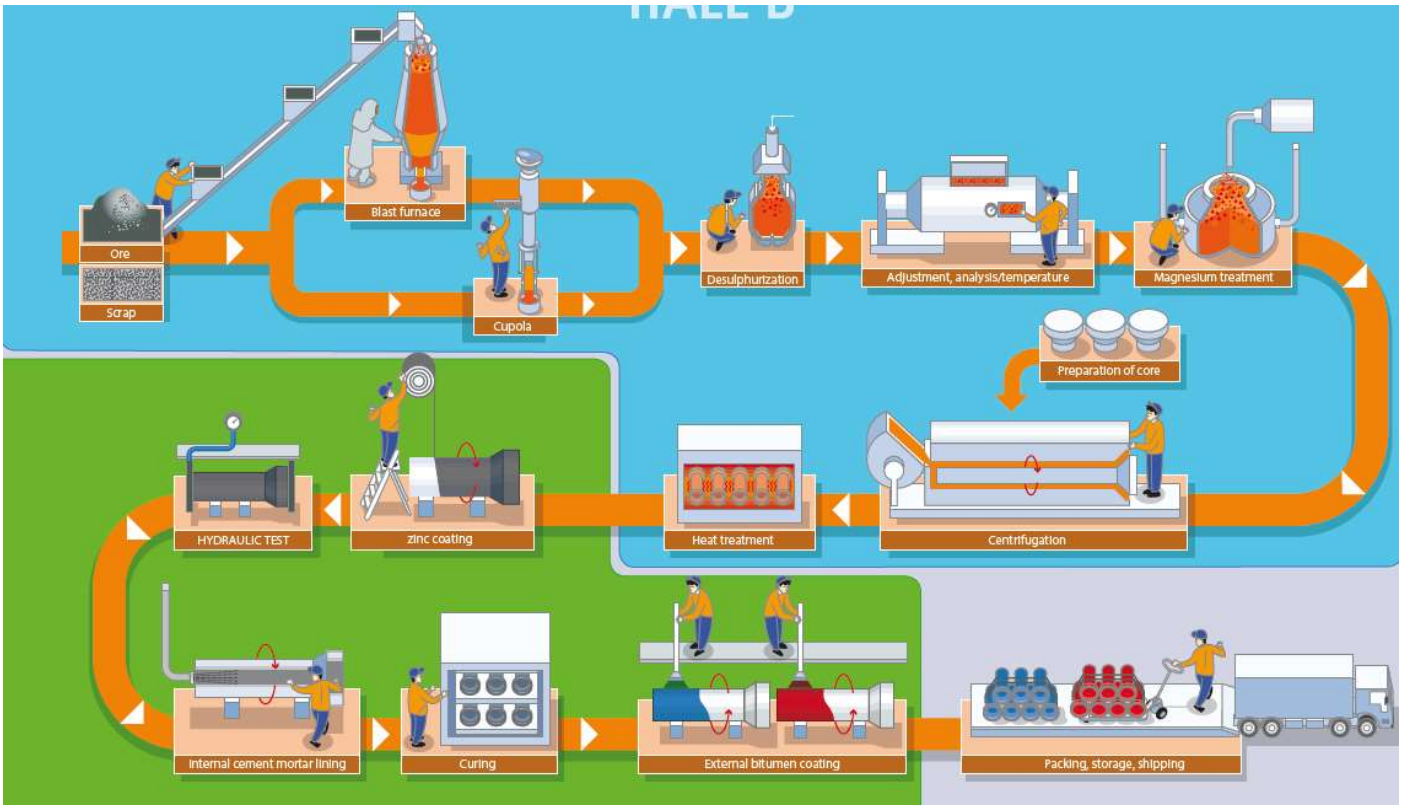
	Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundary
	Raw materials	**Transport**	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / Demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling potential
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU
Specific data used	>90% GWP					-	-	-	-	-	-	-	-	-	-	-	-
Variation	-					-	-	-	-	-	-	-	-	-	-	-	-

Product stage - A1 to A3:

A1: Raw material extraction and processing, processing of secondary material input
This module takes into account the supply and processing of all raw materials and energies that occur upstream of the manufacturing process. In particular, it covers the supply of raw materials for the manufacture of pig iron, such as iron ore. Recycled materials (scrap metal) are another source of raw material, supplied locally.

A2: Transport to the manufacturer
Raw materials are transported to manufacturing sites. Modelling includes road, rail and ship transportation for each of the raw materials.

A3: Manufacturing
Pipe systems manufacturing follows the steps shown in the diagram below.



Waste generation is included in life cycle inventory, as well as packaging.

Construction process stage - A4 to A5

A4: Transport to the building site

This module includes representative transport of finished products to the customer site, over an average distance of 700 kilometres.

Vehicle type used for transport and consumption of vehicle (fuel)	Truck Diesel driven, Euro 0 - 6 mix, 34 - 40t gross weight / 27t payload capacity Consumption: 32 l / 100 km
Distance	European market Truck: 700 km
Capacity utilisation (including empty returns)	58%
Bulk density of transported products	475 kg/m^3
Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products)	Not applicable

A5: Installation

Pipe laying requires digging a trench, installing the pipe and backfilling around the pipe.
Dimension of the trench is in compliance with EN1610 requirements and height of cover is 1 meter.

Ancillary materials for installation (specified by material)	Sand (bedding): 241 kg / FU Gravel (backfill): 663 kg / FU
Water use	None
Other resource use	Diesel: 1.57 l / FU
Quantitative description of energy type (regional mix) and consumption during the installation process	63 MJ / FU (fuel)
Waste materials on the building site before waste processing, generated by the product's installation	Excavated soil: 904 kg / FU Caps: 0.13 kg / FU Dunnage : 1.76 kg / FU
Output materials as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	Dunnage reused
Direct emissions to ambient air, soil and water	None

Use stage - B1 to B7

B1: Use
B2: Maintenance
B3: Repair
B4: Replacement
B5: Refurbishment

Repair impact is negligible due to low probability of issue. There is no impact during these phases.

B6: Operational energy use
To convey water within pipe system, pumping can be necessary. Scenario includes impacts caused by energy necessary for pumping (electricity).

Ancillary materials specified by material	None
Net fresh water consumption	None
Type of energy carrier	Electricity: 77 MJ / year / FU See “additional information” section for more information
Characteristic performance	Hydraulic efficiency: 0.7 Electricity efficiency : 0.7
Further assumptions for scenario development	Frequency of pumping: 8 hours / day Flow velocity: 1 m/s Roughness: 0.1 mm

B7: Operational water use
The function of pipe network is to convey water, but it does not consume water to work.

End-of-life - C1 to C4

C1: Deconstruction, demolition
When pipe network is dismantled, this stage is included in the construction phase of the replacement network. Therefore, there are no impacts due to deconstruction because these impacts are taken into account in the construction phase of the new pipe network.

C2: Transportation of waste
Recycled products (metal) can be either transported to scrap dealer network or to PAM plants to be incorporated in melting process. The distance of transportation of recycled products is equivalent to the distance considered in stage A4, i.e. 700 km (conservative approach). Waste is transported to landfilling on a distance of 25 km.

C3: Waste processing
Most part of product is recycled, i.e. 95% of metal. Module takes into account the collection, transport, sorting, pressing operations specific to scrap, and also treatment of waste.

C4: Waste disposal
5% of metal (metal loss), the elastomer gasket, the lining and the coating go to landfilling.

Collection process specified by type	Mass collected Total: 150.6 kg/FU
Recovery system specified by type	Recycling Metal: 120.4 kg/FU
Disposal specified by type	Landfilling Metal: 6.4 kg/FU Gasket: 0.4 kg/FU Lining: 1.0 kg/FU Coating (mortar): 22.5 kg/FU
Assumptions for scenario development, e.g. transportation	Truck / Payload: 7.5 - 16 tons Distance of transportation of recycled material: 700 km Distance of transportation of waste: 25 km

Benefits and loads beyond the product system boundary - D

Ductile iron is 100% recyclable, and this indefinitely. Metal, considered as scrap iron at end-of-life, is recycled by ferrous metal recycling process like electric furnace. Recycled metal enables reduction of impacts thanks to diminution of use of primary raw materials and energy in melting process. Benefit results from the difference of environmental impact between a product made with primary raw material (iron ore) and a product made with secondary raw material (scrap iron). Environmental burdens of recycling are considered as well as the benefit for avoiding future raw materials extraction.

Pipe is composed of 84% of ductile iron, 5% is considered lost at dismantling and 40% is already recycled material.
Mass of product considered in module D is then: 150.6 x 0.84 x 0.95 x (1-0.4) = 72.1 kg/FU.

Life cycle assessment results

Results of environmental impact indicators, as per Life Cycle Impact Assessment (LCIA) rules, are provided below. The Indicators give the environmental impacts, use of resources, the waste generated as well as output flows (materials, components or energy that are reused, recycled or recovered) throughout A to D stages.
An overview of the results is also added to display a quick reading of life cycle assessment results.

Results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Each indicator is expressed per meter of pipe, for a network use of 100 years (See definition of functional unit).

ENVIRONMENTAL IMPACTS

A1 / A2 / A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Recycling potential
Global warming potential - total *(kg CO2 eq)*														
3,23E+02	7,49E+00	2,64E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,90E+02	0,00E+00	0,00E+00	1,84E+01	1,64E-01	3,11E-01	-1,18E+02
Global warming potential - fossil fuels *(kg CO2 eq)*														
3,10E+02	7,31E+00	2,75E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,83E+02	0,00E+00	0,00E+00	1,83E+01	1,56E-01	3,08E-01	-1,18E+02
Global warming potential - biogenic *(kg CO2 eq)*														
1,23E+01	1,87E-01	-1,15E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,64E+00	0,00E+00	0,00E+00	5,21E-02	7,99E-03	2,96E-03	-2,47E-01
Global warming potential - land use and land use change *(kg CO2 eq)*														
3,67E-01	6,96E-04	8,02E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,88E-01	0,00E+00	0,00E+00	7,83E-03	2,95E-04	1,45E-04	-1,38E-02
Ozone depletion potential *(kg CFC 11 eq)*														
8,54E-06	7,81E-13	3,48E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,11E-08	0,00E+00	0,00E+00	4,08E-06	9,73E-09	9,54E-08	-4,59E-06
Acidification potential *(mol H+ eq)*														
9,51E-01	4,31E-02	1,67E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,42E+00	0,00E+00	0,00E+00	8,81E-02	9,03E-04	2,60E-03	-4,69E-01
Eutrophication potential - freshwater *(kg P eq)*														
8,61E-02	2,40E-06	1,76E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,72E-03	0,00E+00	0,00E+00	1,45E-03	1,43E-04	9,07E-05	-5,06E-02
Eutrophication potential - freshwater *(kg PO4 eq)*														
2,64E-01	7,37E-06	5,40E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,35E-03	0,00E+00	0,00E+00	4,45E-03	4,39E-04	2,78E-04	-1,55E-01
Eutrophication potential - marine *(kg N eq)*														
2,46E-01	2,14E-02	5,25E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,79E-01	0,00E+00	0,00E+00	2,99E-02	1,89E-04	9,04E-04	-1,08E-01
Eutrophication potential - terrestrial *(mol N eq)*														
2,55E+00	2,35E-01	5,77E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,98E+00	0,00E+00	0,00E+00	3,26E-01	1,78E-03	9,83E-03	-1,11E+00
Formation potential of tropospheric ozone *(kg NMVOC eq)*														
1,22E+00	4,03E-02	1,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,94E-01	0,00E+00	0,00E+00	9,33E-02	4,97E-04	2,84E-03	-5,80E-01
Abiotic depletion potential for non fossil resources *(kg Sb eq)* *														
8,02E-04	4,00E-07	3,21E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,29E-04	0,00E+00	0,00E+00	8,76E-05	1,43E-06	1,01E-06	-2,03E-03
Abiotic depletion potential for fossil resources *(MJ)* *														
3,71E+03	1,00E+02	3,58E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,47E+04	0,00E+00	0,00E+00	2,78E+02	3,50E+00	7,41E+00	-1,44E+03
Water user deprivation potential *(m3 world eq. deprived)* *														
4,58E+01	8,93E-03	4,24E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,26E+02	0,00E+00	0,00E+00	1,45E+00	1,04E-01	3,30E-01	-4,10E+00

(*) 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

The table hereunder provides the global warming potential indicator as per previous standard EN15804:2012+A1:2013.

ADDITIONAL INDICATORS

production			construction		use						end of life			benefit
A1 / A2 / A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Recycling potential
Global warming potential *(kg CO2 eq)*														
3,07E+02	7,40E+00	2,56E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,75E+02	0,00E+00	0,00E+00	1,82E+01	1,61E-01	3,03E-01	-1,11E+02

RESOURCE USE

production			construction		use						end of life			benefit
A1 / A2 / A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Recycling potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *(MJ)*														
2,44E+02	2,56E+00	3,74E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,06E+03	0,00E+00	0,00E+00	4,46E+00	5,24E-01	1,20E-01	-8,73E+01
Use of renewable primary energy resources used as raw materials *(MJ)*														
3,65E-01	0,00E+00	3,60E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources *(MJ)*														
2,45E+02	2,56E+00	3,74E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,06E+03	0,00E+00	0,00E+00	4,46E+00	5,24E-01	1,20E-01	-8,73E+01
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials *(MJ*														
3,64E+03	1,01E+02	3,58E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,47E+04	0,00E+00	0,00E+00	2,78E+02	3,50E+00	7,41E+00	-1,44E+03
Use of non renewable primary energy resources used as raw materials *(MJ)*														
6,94E+01	0,00E+00	6,85E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non renewable primary energy resources *(MJ)*														
3,71E+03	1,01E+02	3,58E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,47E+04	0,00E+00	0,00E+00	2,78E+02	3,50E+00	7,41E+00	-1,44E+03
Use of secondary material *(kg)*														
5,05E+01	0,00E+00	4,98E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels *(MJ)*														
0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels *(MJ)*														
0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water *(m^3)*														
1,24E+00	6,43E-04	1,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,45E+00	0,00E+00	0,00E+00	3,38E-02	2,41E-03	7,67E-03	-9,55E-02

WASTE

A1 / A2 / A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Recycling potential

Hazardous waste disposed *(kg)*

1,24E-07	2,49E-10	2,75E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Non hazardous waste disposed *(kg)*

1,82E+01	2,67E-03	9,15E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,94E+01	0,00E+00

Radioactive waste disposed *(kg)*

1,44E-01	1,20E-04	3,37E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,32E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

OUTPUT FLOWS

A1 / A2 / A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Recycling potential

Components for re-use *(kg)*

0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Materials for recycling *(kg)*

4,53E+01	0,00E+00	2,27E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E+02	0,00E+00	0,00E+00

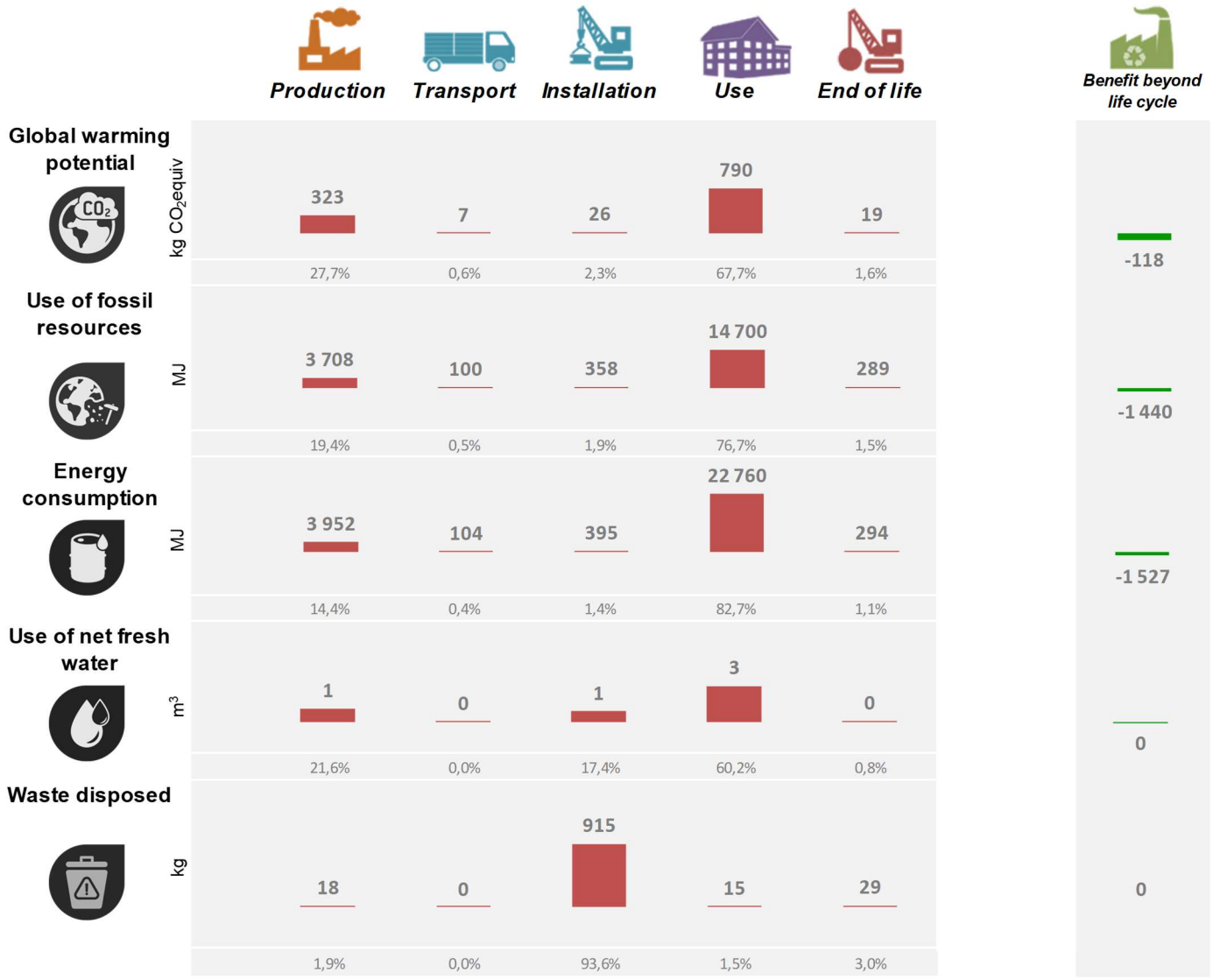
Materials for energy recovery *(kg)*

0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Exported energy *(MJ)*

0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

LCA OVERVIEW



Additional information

In following table, information relative to electricity production used for stage B6 modelling (pumping impacts) are given.

Location	Representative of average production in European Union
Types of energy used for electricity production and relative contribution	Biofuels: 5% Coal: 19% Hydro: 12% Oil: 2% Natural gas: 19% Nuclear: 25% Photovoltaics: 4% Wind: 12% Others: 2%
Reference	Sphera - Electricity mix - Europe - 2018

Disclaimers to the declaration of environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, accumulated exceedance (AP)	None
	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, accumulated exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential comparative toxic unit for ecosystems (ETP-fw)	2
	Potential comparative toxic unit for humans (HTP-c)	2
	Potential comparative toxic unit for humans (HTP-nc)	2
	Potential soil quality index (SQP)	2

Disclaimer 1
This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator

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

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