



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Nonwoven
BontexGeo NV



EPD HUB, HUB-6059

Published on 22.04.2026, last updated on 22.04.2026, valid until 22.04.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.



Created with One Click LCA



GENERAL INFORMATION

MANUFACTURER

Manufacturer	BontexGeo NV
Address	Industriestraat 39/Zone Z2, Zele, Belgium
Contact details	info@bontexgeo.com
Website	https://bontexgeo.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Veronique Brosse from BontexGeo NV
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Yazan Badour as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Geosynthetics
Additional labels	Bontec
Product reference	Polypropylene geotextiles
Place(s) of raw material origin	Europe
Place of production	Zele, Belgium
Place(s) of installation and use	Worldwide
Period for data	calendar year 2025
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	0
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	26,7

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
Mass of packaging	0,01313 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	1,7
GWP-total, A1-A3 (kgCO ₂ e)	1,69
Secondary material, inputs (%)	0
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	3,75
Net freshwater use, A1-A3 (m ³)	0,02

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The Bontexgeo Group is a leading supplier of design led solutions for the built environment, renowned for its unwavering commitment to excellence, innovation, and sustainability. As leaders in the civils and building sector, Bontexgeo Group has established a legacy of excellence and innovation. Our technical expertise means we offer cost effective solutions, and value engineering opportunities can be developed for many civil engineering problems. The support extends to full design services, design validation, feasibility studies, cost advice and advice on meeting regulatory requirements.

With multiple sites across Europe, the Bontexgeo Group is always close to the heart of our business, our customers. Understanding their needs and aspirations is key to our success.

Our innovative designs and methods aim to reduce the carbon footprint, conserve resources, and promote ecological balance. By integrating sustainability into our core operations, we are helping to build a more resilient and sustainable construction industry.

Bontexgeo Group is heavily involved in developing and driving knowledge within our markets; several Bontexgeo Group experts work with both local and international regulatory bodies on developing guidance and best practices for the use of innovative geosynthetics to solve complex engineering issues.

PRODUCT DESCRIPTION

This Bontexgeo geotextile is made up of polypropylene (PP), which is the main raw material, and additives for UV stabilization and performance improvements.

Bontexgeo NV geotextiles are available in various brands and versions which are all presented on Bontexgeo's website.

The Bontec range is offered in 6 different product categories : NW, SNW, PROTEC, NS, TS, PAVEMAT and LAVAPROTEC. The weight of the products

varies between 70 g/m² and 1000 g/m².

Testing method	Value	Unit
Static puncture strength (CBR-EN-ISO 12236)	0.85 – 11.5	kN
Cone drop test (EN ISO 13433)	42 – 0.0	mm
Characteristic opening size (O90) – EN ISO 12956	145 - 60	µm
Water permeability normal to plane (EN ISO 11058)	125 - 15	l/m ² s
Thickness under 2 kPa (EN ISO 9863 – 1)	0.9 – 7	mm
Mass per unit of area (EN ISO 9864)	70 - 1000	g/m ²
Tensile strength (longitudinal) (EN ISO 10319)	5 – 70	kN/m
Tensile strength (lateral) (EN ISO 10319)	5 - 75	kN/m
Elongation at max load (longitudinal) (EN ISO 10319)	45 - 85	%
Elongation at max load (lateral) (EN ISO 10319)	50 - 85	%
Durability (Annex B)	100 years – Predicted minimal durability in natural soils with 4 <= pH <= 9 and soil temperatures < = 25°C	

The product's performance values comply with the declaration of performance in relation to its main features in accordance with the following European application standards :

EN 13249:2016 : Road construction

EN 13250:2016 : Railway applications

EN 13251:2016 : Earthworks, foundations, retaining structures

EN 13252:2016 : Drainage systems

EN 13253:2016 : Protection of membranes

EN 13254:2016 : Reservoirs and dams

EN 13255:2016 : Tunnels and underground structures

EN 13256:2016 : Landfills & waste disposal

EN 13257:2016 : Coastal & river works

EN 13265:2016 : Liquid waste containment projects

EN 15381:2008 : Reinforcement, stress relief, sealing

The geosynthetics do not contain substances listed in the "Candidate List of Substances of Very High Concern for Authorisation".

Further information can be found at:

<https://bontexgeo.com/>

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	Not applicable
Minerals	0	Not applicable
Fossil materials	100	85 % supply from Europe/ 15% supply from World
Bio-based materials	0	Not applicable

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,00645

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	100 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVH substances in amounts greater than 0.1% (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The geosynthetics is made from polypropylene staple fibers. The staple fiber and non woven are manufactured in Zele Belgium and delivered worldwide to customers. Main materials present are PP granulates and UV stabilizing agent. Bontexgeo receives the PP granulates from different suppliers. Manufacturing of geosynthetics including use of energy, water and auxiliary materials at the factory as well as internal waste generation and packaging. The inputs for the production process are raw materials and energy in form of electricity, natural gas, water, auxiliary materials (spinfinish oil) and liquified petroleum gas for forklifts. Wooden pallets are used for the shipment of small rolls. Timber beams are an ancillary material to make transport safer.

Waste from production is sent to waste treatment (recycling). The transportation to the recycling facility is included but not the activities at the recycling facility.

Product specific data are based on annual company data for the period January 2025 to December 2025.

The electricity, gas and water are based on a one-year cycle (year 2025). The energy, natural gas and water inputs are then divided by the production output for one year to allocate the consumption per kg of the product.

Bontexgeo purchases packaging materials used to transport the geosynthetics to the installation site. Packaging materials are polyethylene foil (PE), wooden pallet, timber beams and PE or cardboard cores.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to PCR. Average distance of transportation from production plant to EU-customers site is assumed as

548 km and the transportation method is assumed to be lorry. Average distance of transportation to Non-EU customers site is assumed as 8134 km and the transportation method is assumed to be containership. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. (Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. (Empty returns are considered in the Ecoinvent database). Transportation does not cause losses as product is packaged properly. Environmental impacts from installation into the civil infrastructure include. Installation of the product at the construction site is done manually.

PRODUCT END OF LIFE (C1-C4, D)

Module C1 : The geosynthetics is dismantled together with the application (road, landfills, ...) and the geosynthetics are removed. It is assumed that the dismantling equipment requires fuel, which is modelled by use of 0.17 kg diesel/ton excavated material.

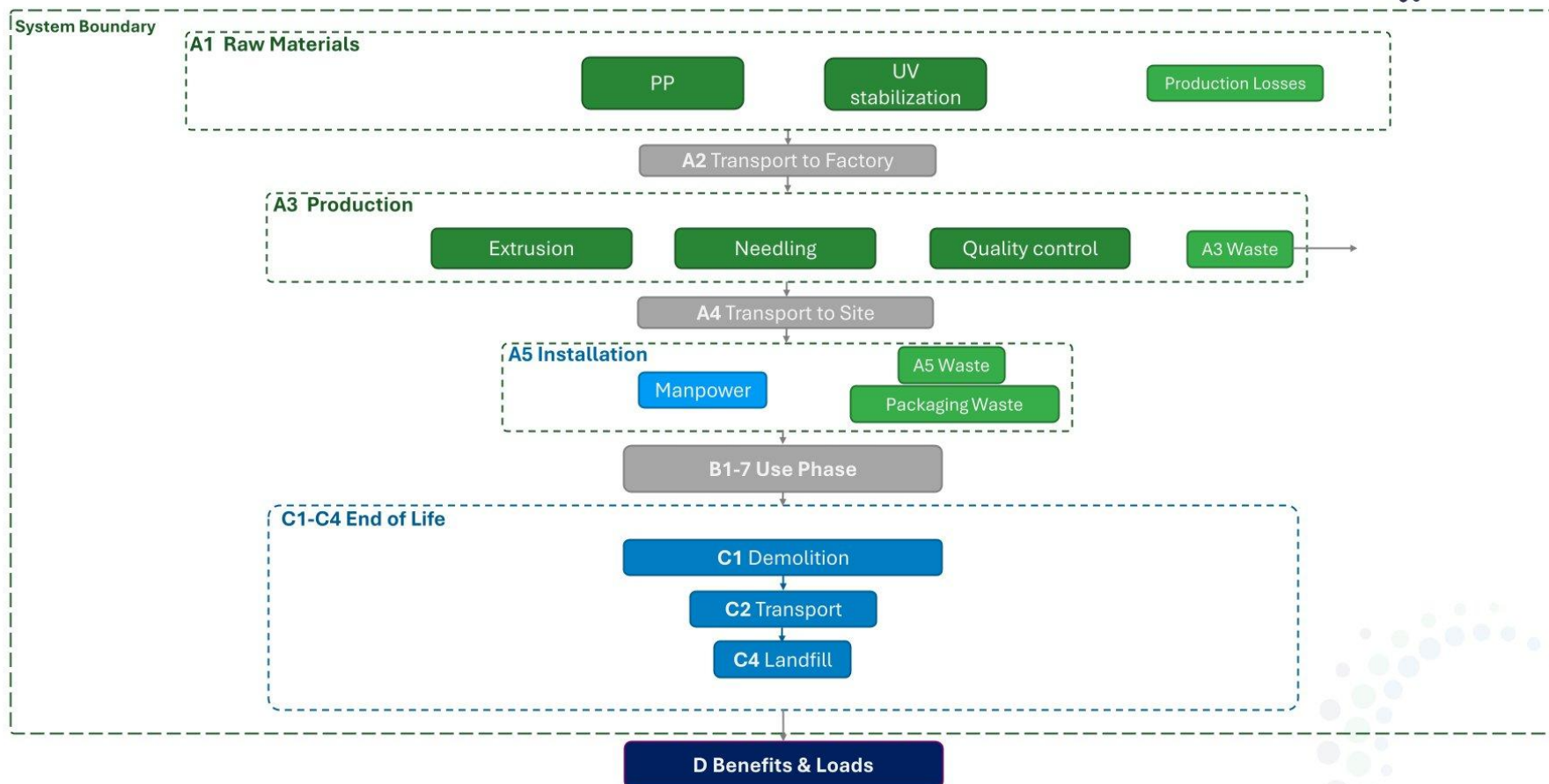
Module C2 : Transportation of the discarded products from the construction site to waste treatment. The scenario used a truck transporting the geosynthetics at a conservatively estimated average distance of 100 km.

Module C3 : We assume that 100% is landfilled at the end-of-life.

Module D : No reuse, recycling or recovery of the geosynthetics product is considered for the product at the end-of-life. Crediting of heat from incineration and recycling of packaging material A5 is included in module D.

MANUFACTURING PROCESS

Life-cycle diagram Non woven Zele, Belgium



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

Note on indicator consistency:

A technical inconsistency between PENRT (Total use of non-renewable primary energy) and ADP fossil (Abiotic depletion potential for fossil resources) results in modules C1-C4 has been identified. This originates from the polypropylene treatment datapoint. These inconsistencies are inherent to the background databases used and cannot be adjusted by the practitioner.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	0

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

The EPDs state that the geosynthetics do not contain substances listed in the "Candidate List of Substances of Very High Concern for Authorisation.

This is documented in the company declaration entitled "Reach statement-version 04-2019". Further information can be found at the Bontexgeo webpage : <https://bontexgeo.com/>.

ENVIRONMENTAL IMPACT DATA

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

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	1,22E+00	6,92E-02	4,03E-01	1,69E+00	2,56E-01	5,05E-02	ND	ND	ND	ND	ND	ND	ND	3,98E-03	0,00E+00	0,00E+00	1,03E-01	-1,31E-02
GWP – fossil	kg CO ₂ e	1,21E+00	6,91E-02	4,26E-01	1,70E+00	2,56E-01	2,60E-02	ND	ND	ND	ND	ND	ND	ND	3,98E-03	0,00E+00	0,00E+00	1,03E-01	-1,21E-02
GWP – biogenic	kg CO ₂ e	7,61E-03	1,22E-05	-2,35E-02	-1,59E-02	1,59E-04	2,45E-02	ND	ND	ND	ND	ND	ND	ND	1,06E-06	0,00E+00	0,00E+00	-6,30E-05	-1,00E-03
GWP – LULUC	kg CO ₂ e	2,01E-03	3,26E-05	1,47E-04	2,19E-03	1,13E-04	7,86E-07	ND	ND	ND	ND	ND	ND	ND	5,09E-07	0,00E+00	0,00E+00	7,19E-06	-8,18E-06
Ozone depletion pot.	kg CFC-11e	1,71E-08	1,01E-09	1,22E-08	3,03E-08	4,90E-09	9,89E-12	ND	ND	ND	ND	ND	ND	ND	6,35E-11	0,00E+00	0,00E+00	2,89E-10	-4,92E-10
Acidification potential	mol H ⁺ e	4,33E-03	1,34E-03	1,28E-03	6,95E-03	4,01E-03	6,60E-06	ND	ND	ND	ND	ND	ND	ND	3,48E-05	0,00E+00	0,00E+00	7,91E-05	-4,64E-05
EP-freshwater ²⁾	kg Pe	1,53E-04	3,31E-06	3,73E-04	5,30E-04	1,58E-05	2,86E-07	ND	ND	ND	ND	ND	ND	ND	1,90E-07	0,00E+00	0,00E+00	1,16E-06	-3,80E-06
EP-marine	kg Ne	7,56E-04	3,45E-04	2,68E-04	1,37E-03	1,25E-03	4,74E-06	ND	ND	ND	ND	ND	ND	ND	1,61E-05	0,00E+00	0,00E+00	2,28E-04	-7,91E-06
EP-terrestrial	mol Ne	7,96E-03	3,83E-03	2,64E-03	1,44E-02	1,38E-02	2,82E-05	ND	ND	ND	ND	ND	ND	ND	1,76E-04	0,00E+00	0,00E+00	3,23E-04	-8,11E-05
POCP (“smog”) ³⁾	kg NMVOCe	3,87E-03	1,08E-03	1,34E-03	6,28E-03	3,91E-03	8,47E-06	ND	ND	ND	ND	ND	ND	ND	5,27E-05	0,00E+00	0,00E+00	1,36E-04	-5,75E-05
ADP-minerals & metals ⁴⁾	kg Sbe	1,83E-05	1,13E-07	1,08E-06	1,95E-05	8,66E-07	6,70E-09	ND	ND	ND	ND	ND	ND	ND	1,86E-09	0,00E+00	0,00E+00	2,51E-08	-4,44E-08
ADP-fossil resources	MJ	8,00E-01	9,08E-01	1,19E+01	1,36E+01	3,31E+00	1,02E-02	ND	ND	ND	ND	ND	ND	ND	5,17E-02	0,00E+00	0,00E+00	2,48E-01	-3,52E-01
Water use ⁵⁾	m ³ e depr.	5,17E-01	3,27E-03	9,78E-02	6,18E-01	1,38E-02	7,75E-04	ND	ND	ND	ND	ND	ND	ND	1,88E-04	0,00E+00	0,00E+00	1,19E-03	-3,54E-03

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,59E-08	3,93E-09	1,24E-08	6,22E-08	1,15E-08	3,31E-10	ND	ND	ND	ND	ND	ND	ND	9,88E-10	0,00E+00	0,00E+00	1,80E-09	-2,30E-10
Ionizing radiation ⁶⁾	kBq 11235e	6,48E-02	5,51E-04	3,38E-01	4,03E-01	2,15E-03	3,86E-05	ND	ND	ND	ND	ND	ND	ND	3,13E-05	0,00E+00	0,00E+00	2,42E-04	-2,03E-03
Ecotoxicity (freshwater)	CTUe	1,46E+00	9,21E-02	4,41E+00	5,96E+00	2,33E+00	5,71E-01	ND	ND	ND	ND	ND	ND	ND	3,28E-02	0,00E+00	0,00E+00	3,16E-01	-7,56E-02
Human toxicity, cancer	CTUh	2,25E-10	1,31E-11	3,42E-10	5,80E-10	4,66E-11	3,33E-12	ND	ND	ND	ND	ND	ND	ND	5,35E-13	0,00E+00	0,00E+00	5,32E-12	-1,34E-12
Human tox. non-cancer	CTUh	6,26E-09	3,76E-10	1,84E-09	8,47E-09	1,32E-09	6,33E-11	ND	ND	ND	ND	ND	ND	ND	7,63E-12	0,00E+00	0,00E+00	9,82E-10	-6,58E-11
SQP ⁷⁾	-	1,02E+00	4,35E-01	2,96E+00	4,41E+00	1,10E+00	1,48E-02	ND	ND	ND	ND	ND	ND	ND	3,62E-03	0,00E+00	0,00E+00	5,79E-01	-3,46E-02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	9,39E-01	8,94E-03	3,69E-01	1,32E+00	4,06E-02	-4,82E-02	ND	ND	ND	ND	ND	ND	ND	4,69E-04	0,00E+00	0,00E+00	3,82E-03	-1,87E-02
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,21E-01	2,21E-01	0,00E+00	-2,21E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,00E-03
Total use of renew. PER	MJ	9,39E-01	8,94E-03	5,90E-01	1,54E+00	4,06E-02	-2,70E-01	ND	ND	ND	ND	ND	ND	ND	4,69E-04	0,00E+00	0,00E+00	3,82E-03	-1,37E-02
Non-re. PER as energy	MJ	7,84E-01	9,08E-01	1,05E+01	1,22E+01	3,31E+00	-8,81E-01	ND	ND	ND	ND	ND	ND	ND	5,17E-02	0,00E+00	0,00E+00	-3,85E+01	-3,52E-01
Non-re. PER as material	MJ	6,75E-01	0,00E+00	2,31E-02	6,98E-01	0,00E+00	-2,31E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-6,21E-01	1,53E-01
Total use of non-re. PER	MJ	1,46E+00	9,08E-01	1,05E+01	1,29E+01	3,31E+00	-9,04E-01	ND	ND	ND	ND	ND	ND	ND	5,17E-02	0,00E+00	0,00E+00	-3,91E+01	-1,99E-01
Secondary materials	kg	2,82E-05	3,92E-04	3,21E-03	3,63E-03	1,55E-03	2,85E-05	ND	ND	ND	ND	ND	ND	ND	3,69E-05	0,00E+00	0,00E+00	8,97E-05	4,21E-03
Renew. secondary fuels	MJ	2,05E-07	2,62E-06	5,14E-03	5,15E-03	9,14E-06	2,80E-07	ND	ND	ND	ND	ND	ND	ND	6,07E-08	0,00E+00	0,00E+00	1,68E-06	-1,36E-07
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m³	1,33E-02	9,08E-05	2,61E-03	1,60E-02	3,45E-04	-1,53E-05	ND	ND	ND	ND	ND	ND	ND	4,08E-06	0,00E+00	0,00E+00	-3,70E-03	-8,21E-05

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	4,31E-04	1,29E-03	8,40E-03	1,01E-02	6,42E-03	2,75E-04	ND	ND	ND	ND	ND	ND	ND	9,15E-05	0,00E+00	0,00E+00	4,33E-04	-4,25E-04
Non-hazardous waste	kg	1,20E-02	2,07E-02	1,56E-01	1,89E-01	1,05E-01	2,63E-02	ND	ND	ND	ND	ND	ND	ND	1,30E-03	0,00E+00	0,00E+00	4,97E+00	-9,54E-02
Radioactive waste	kg	5,47E-08	1,34E-07	7,98E-05	8,00E-05	5,29E-07	9,03E-09	ND	ND	ND	ND	ND	ND	ND	7,73E-09	0,00E+00	0,00E+00	5,92E-08	-5,19E-07

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	1,10E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	1,30E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,40E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,60E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	1,19E+00	6,88E-02	4,23E-01	1,69E+00	2,55E-01	2,67E-02	ND	ND	ND	ND	ND	ND	ND	3,96E-03	0,00E+00	0,00E+00	9,84E-02	-1,18E-02
Ozone depletion Pot.	kg CFC ₁₁ e	1,49E-08	8,00E-10	9,73E-09	2,55E-08	4,48E-09	8,22E-12	ND	ND	ND	ND	ND	ND	ND	5,06E-11	0,00E+00	0,00E+00	2,31E-10	-4,02E-10
Acidification	kg SO ₂ e	3,63E-03	1,06E-03	1,06E-03	5,75E-03	3,09E-03	4,83E-06	ND	ND	ND	ND	ND	ND	ND	2,45E-05	0,00E+00	0,00E+00	5,87E-05	-3,89E-05
Eutrophication	kg PO ₄ ³ e	6,65E-04	1,28E-04	2,67E-04	1,06E-03	4,70E-04	2,28E-06	ND	ND	ND	ND	ND	ND	ND	5,75E-06	0,00E+00	0,00E+00	3,63E-05	-1,63E-05
POCP (“smog”)	kg C ₂ H ₄ e	2,88E-04	5,56E-05	8,03E-05	4,24E-04	1,88E-04	8,66E-07	ND	ND	ND	ND	ND	ND	ND	1,86E-06	0,00E+00	0,00E+00	1,95E-05	-4,32E-06
ADP-elements	kg Sbe	1,83E-05	1,10E-07	1,07E-06	1,95E-05	8,57E-07	6,51E-09	ND	ND	ND	ND	ND	ND	ND	1,81E-09	0,00E+00	0,00E+00	2,44E-08	-4,33E-08

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-fossil	MJ	7,89E-01	8,99E-01	5,76E+00	7,44E+00	3,27E+00	9,58E-03	ND	ND	ND	ND	ND	ND	ND	5,12E-02	0,00E+00	0,00E+00	2,44E-01	-3,17E-01

ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements	kg Sbe	0,00E+00	1,10E-07	1,85E-08	1,29E-07	1,69E-07	4,15E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,44E-08	0,00E+00
Hazardous waste disposed	kg	4,31E-04	1,29E-03	8,40E-03	1,01E-02	6,42E-03	2,75E-04	ND	ND	ND	ND	ND	ND	ND	9,15E-05	0,00E+00	0,00E+00	4,33E-04	-4,25E-04
Non-haz. waste disposed	kg	1,20E-02	2,07E-02	1,56E-01	1,89E-01	1,05E-01	2,63E-02	ND	ND	ND	ND	ND	ND	ND	1,30E-03	0,00E+00	0,00E+00	4,97E+00	-9,54E-02
Air pollution	m³	1,09E+02	1,43E+01	8,73E+01	2,10E+02	5,72E+01	4,17E-01	ND	ND	ND	ND	ND	ND	ND	6,06E-01	0,00E+00	0,00E+00	2,60E+00	-2,00E+00
Water pollution	m³	1,67E+00	4,35E-01	5,13E+00	7,23E+00	1,42E+00	5,47E-03	ND	ND	ND	ND	ND	ND	ND	2,42E-02	0,00E+00	0,00E+00	1,32E-01	-2,33E-01

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	1,21E+00	6,92E-02	4,26E-01	1,70E+00	2,56E-01	2,60E-02	ND	ND	ND	ND	ND	ND	ND	3,98E-03	0,00E+00	0,00E+00	1,03E-01	-1,21E-02

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO₂ is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Refinery gas, burned in furnace, Albania, Ecoinvent, 0.0769 kgCO₂e/MJ
2. Electricity, medium voltage, residual mix, Belgium, Ecoinvent, 0.23 kgCO₂e/kWh
3. CNG (compressed natural gas) for transport, including combustion CO₂, Europe, Ecoinvent, 3.91 kgCO₂e/kg
4. Electricity production, photovoltaic, 570kWp open ground installation, multi-Si, Belgium, Ecoinvent, 0.0802 kgCO₂e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO5, 548.0 km
2. Market for transport, freight, sea, container ship with reefer, heavy fuel oil, cooling, 8134.0 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	100
Bulk density of transported products	1,11E+02
Volume capacity utilization factor	<1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	-
Water use (m ³)	-
Ancillary materials: type and mass (kg)	-
Waste materials: type and mass (kg)	Rolls with the non-woven material are undone from the packaging foil and are positioned to unroll. Rolls are then rolled out (with a minimum overlap) on the site by manpower. There is no material loss during the installation of the geosynthetics. If the roll is slightly too long or too wide, the geosynthetic is folded so that the excess material is incorporated, and no sections are cut off. 1.06 kg PP waste from product 0.021 kg plastic waste (PE foil) 0.0013 kg wooden waste (wooden pallet + timber beams) 0.0025 kg cardboard waste (Cardboard core).
Waste materials: output routes	Hence, no environmental impacts are associated with the installation of the product. All packaging materials (cardboard, PE foil

	and timber) is assumed to be incinerated. Incineration, including crediting of electricity and heat, are modelled. PP geosynthetics waste : 1.06 kg - 100 % landfill. Packaging waste : 0.0025 kg cardboard, 0.021 kg plastic foil + pe core, 0.0013 kg wood : Total = 0.0248 kg - 100% landfill.
Direct emissions (kg)	-

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	-
Collection process: Mixed waste (kg)	1.0848 kg, mixed waste
Recovery: re-use (kg)	0
Recovery: recycling (kg)	0
Recovery: energy recovery (kg)	0
Disposal (kg)	0
Scenario assumptions e.g. transportation (mode, km) & other	Landfill, 100 km

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez

Tool verification validity: 27 March 2025 - 26 March 2028

Yazan Badour as an authorized verifier for EPD Hub Limited 22.04.2026

