

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Underground Forest
Underground Forest B.V.



EPD HUB, HUB-7908
Published on 22.10.2026, last updated on 22.10.2026, valid until 21.10.2031

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	Underground Forest B.V.
Address	Saftlevenstraat 4, 3015 BM Rotterdam
Contact details	info@undergroundforest.nl
Website	https://undergroundforest.nl

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	Kees de Gruiter, Underground Forest B.V.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Afzal khan Peerukhan as an authorized verifier for EPD Hub

This EPD is intended for business-to-business 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	Underground Forest
Additional labels	Underground Forest Foundations
Product reference	UF1
Place(s) of raw material origin	Ardenne province, Belgium
Place of production	Rotterdam, the Netherlands
Place(s) of installation and use	The Netherlands
Period for data	July 2025 - June 2026
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	4403,23
NOBB (Norwegian Building Product Database)	--
A1-A3 Specific data (%)	17

ENVIRONMENTAL DATA SUMMARY

Declared unit	m3
Declared unit mass	460 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	13,2
GWP-total, A1-A3 ($kgCO_2e$)	-740
Secondary material, inputs (%)	0,02
Total energy use, A1-A3 (kWh)	1350
Net freshwater use, A1-A3 (m^3)	0,03

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Underground Forest B.V. is a Dutch private limited company dedicated to Carbon Dioxide Removal (CDR). This is done by preserving wood in wet anoxic soils so it will permanently remove the carbon dioxide from the atmosphere that the trees have sequestered. Underground Forest was founded in 2023 by Kees de Gruiter based on the expectation that reducing the use of fossil fuel alone could impossibly keep climate change under 1.5 degrees and that additional removal of CO2 would be an absolute necessity. He also saw that construction activities on the saturated soils of the north and west of the Netherlands caused huge emissions of greenhouse gases through the use of concrete piles that had been the industry standard since 1940. He proposed to go back to using wooden piles, which would permanently remove the CO2 that the trees had sequestered during their lives in the forest. Underground Forest monetizes the removals through carbon credits issued by Rainbow Standard to compensate builders for the higher cost of replacing concrete with wood.
Underground Forest is based in the Netherlands and has a staff of four (2026).

PRODUCT DESCRIPTION

Product Description: A wooden foundation for buildings and infrastructure made of piles of Norway Spruce (Picea Abies) driven vertically into saturated anoxic clay or peat in such a way that the complete pile permanently remains under the ground water level. This product is an alternative for a foundation on concrete piles that are now the industry standard. The Underground Forest foundation permanently removes the captured carbon dioxide from the atmosphere as the piles remain in situ indefinitely even after the construction on top is removed.

Further information can be found at:
https://undergroundforest.nl

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	-
Minerals	0	-
Fossil materials	0	-
Bio-based materials	100	Forest, Ardennes, Belgium

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	205,4
Biogenic carbon content in packaging, kg C	0

1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	m3
Mass per declared unit	460 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC 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

A5 is not fully declared. Waste processing (from collection through to end-of-waste or final disposal) and full energy and biogenic carbon balancing are accounted for. Storage, product wastage, and installation into the building are excluded.

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 activity starts with site preparation assuming natural regeneration and/or planting including seedling production (as applicable for the species see general comments field) and includes all process related to forest management, including site preparation, planting, tending, young growth tending, clearing, thinnings and harvesting operations into logs It covers also the maintenance and construction of forest roads. The carbon uptake embodied in biomass (including wood and bark) is included. This activity ends with the assortments at the Huet yard at the edge of the forest.
We use the roundwood, bark and all as it is harvested and they are loaded onto a truck as is, so there is no packaging. This means that we have no A3 stage in the production stage. The trunks are harvested in the forest. Branches and tops remain in the forest as fertilizer for the next generation. The trunks are transported to the yard (44 km on average (Huet Group) where they are picked up by the transporter to take them directly to the project location.
The ancillaries are limited to below 0.5 kg of lubrication oil per declared unit so they are well below the cutoff point. There are no production losses as the piles are cut to size in the forest (A1). If a correction is necessary in the A5 production stage, the sawn off piece is buried in the same anoxic environment as the rest. The saw dust caused by the chainsaw is negligible and well below the cutoff point.

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.
A5 is not in scope. Only packaging waste is accounted for in this module.

The transportation distance is defined according to the PCR. Average weighted distance of transportation from production plant to building site is 287,21 km and the transportation method is by lorry. Vehicle capacity utilization volume factor is assumed to be 38 m3 of wood. The weight varies depending on the freshness of the wood which means that a higher water content of the wood at harvesting (50%) and after 6 months (15%). For transport the mass of a m3 we take the 40% value after one month, so the 38 m3 on the truck weighs between on average 24.25 tonnes. The utilization factor is considered 100 as this close to the maximum weight limits of load plus truck (48 tons in Belgium, 50 tons in the Netherlands). 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. Transportation does not cause losses as the logs are solid wood.

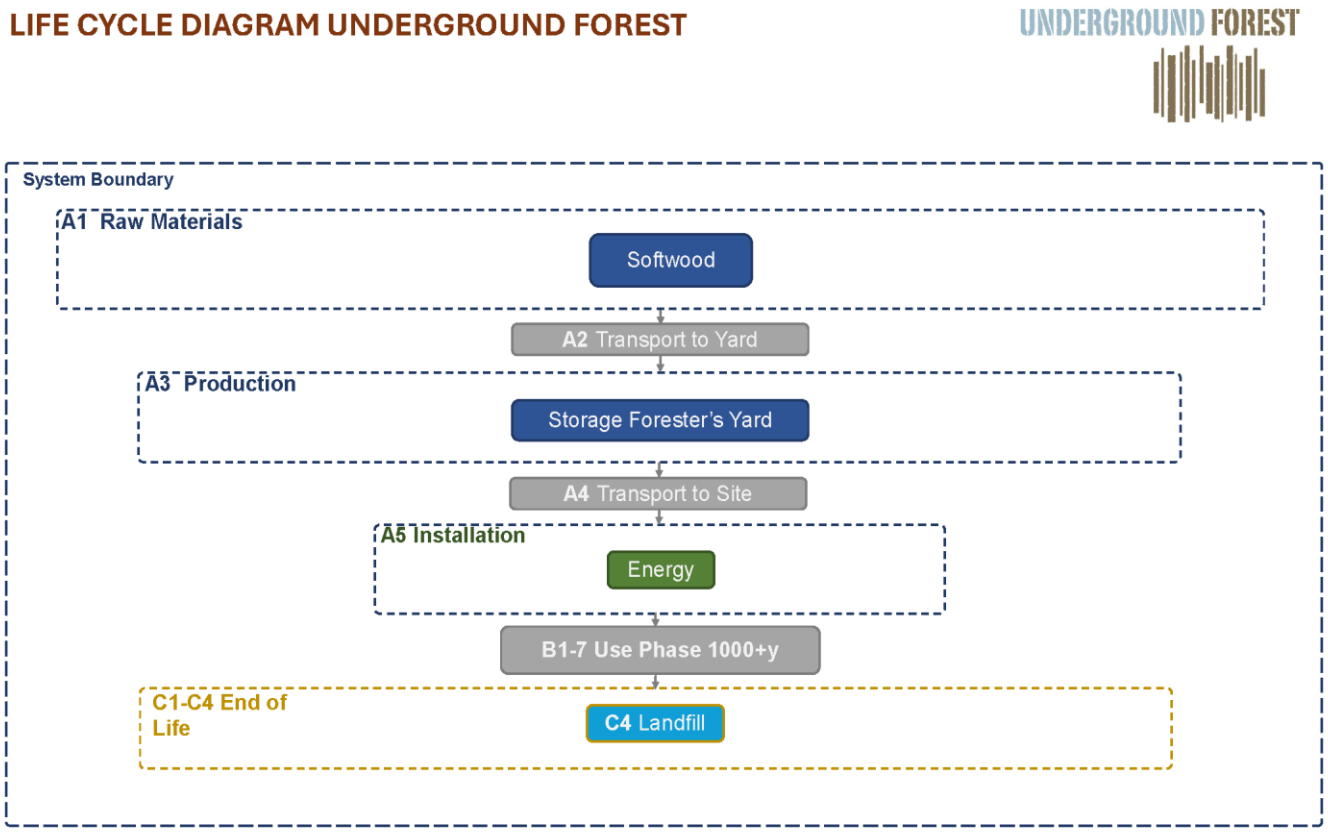
PRODUCT USE AND MAINTENANCE (B1-B7)

This stage is not included in the scope

PRODUCT END OF LIFE (C1-C4, D)

There is no recovery so no loads or benefits
In the production phase the wooden piles are pushed into anoxic saturated layers of peat and clay where they remain in situ forever. Removing them would disturb the separation of water layers underground and is prohibited in many regions and elsewhere it is customary to leave them in situ as there is no advantage in removing them and because of their adhesion to the soil it would take a lot of energy. So the carbon content of the wooden piles remains at the same level for many centuries.

LIFE CYCLE FLOW DIAGRAM



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.

Ancillaries in A1 (lubricating oil) have been reported by the forester Huet Group as less than 0.5 kg per m3, so below the cutoff point. The same goes for the ancillaries of A5.

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	Not applicable
Ancillary materials	Not applicable
Manufacturing energy and waste	No allocation

The permanence of the CO2 removal is high. There has been extensive research by René Klaassen and Jan-Willem van de Kuilen has shown that spruce piles in wet anoxic layers of peat and clay keep 100% of the captured carbon for many centuries. Archeological finds of trees that have been enveloped in peat and clay show that the wood remains unaffected for millennia.

PRODUCT & MANUFACTURING SITES GROUPING

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

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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‘.

Assessment of the Quality and Lifetime of Wooden Pile Foundations, R.W.W.M Klaassen, A. Jorissen, H. Keijer, IPrepared for the RG48 Scientific Conference on Wood Protection, Ghent, Belgium.
Wooden pile foundations: Structural analysis and assessment of remaining load carrying capacity (2024), van de Kuilen, J.-W. G., Ravenshorst, G. J. P., & Gard, W. F., Paper presented at 2nd Annual Conference on Foundation Decarbonization and Re-use, Amsterdam, Netherlands.

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_2e	-7,42E+02	2,25E+00	0,00E+00	-7,40E+02	1,47E+01	1,48E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,58E+02	0,00E+00
GWP – fossil	kg CO_2e	1,10E+01	2,25E+00	0,00E+00	1,32E+01	1,47E+01	1,48E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,01E+00	0,00E+00
GWP – biogenic	kg CO_2e	-7,53E+02	0,00E+00	0,00E+00	-7,53E+02	3,37E-03	2,40E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,53E+02	0,00E+00
GWP – LULUC	kg CO_2e	1,83E-01	1,00E-03	0,00E+00	1,84E-01	6,53E-03	1,50E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,97E-03	0,00E+00
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,53E-07	3,27E-08	0,00E+00	1,86E-07	2,13E-07	2,28E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,35E-07	0,00E+00
Acidification potential	mol H^+e	6,17E-02	7,82E-03	0,00E+00	6,96E-02	5,10E-02	1,32E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,44E-02	0,00E+00
EP-freshwater[2)]	kg Pe	1,36E-03	2,44E-04	0,00E+00	1,60E-03	1,59E-03	4,75E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,96E-03	0,00E+00
EP-marine	kg Ne	2,62E-02	2,58E-03	0,00E+00	2,88E-02	1,69E-02	6,20E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,63E-01	0,00E+00
EP-terrestrial	mol Ne	2,74E-01	2,79E-02	0,00E+00	3,02E-01	1,82E-01	6,78E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,48E-01	0,00E+00
POCP ("smog")[3)]	kg NMVOCe	1,12E-01	1,15E-02	0,00E+00	1,23E-01	7,48E-02	2,04E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,09E-02	0,00E+00
ADP-minerals & metals[4)]	kg Sbe	2,64E-05	6,43E-06	0,00E+00	3,29E-05	4,20E-05	5,39E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,69E-06	0,00E+00
ADP-fossil resources	MJ	1,46E+02	3,21E+01	0,00E+00	1,78E+02	2,09E+02	1,92E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,11E+02	0,00E+00
Water use[5)]	m^3e depr.	1,22E+00	1,87E-01	0,00E+00	1,41E+00	1,22E+00	4,82E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,90E+00	0,00E+00

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	5,89E-07	2,20E-07	0,00E+00	8,09E-07	1,44E-06	3,78E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	8,14E-07	0,00E+00
Ionizing radiation[6]	kBq U235e	3,22E-01	2,69E-02	0,00E+00	3,49E-01	1,76E-01	8,03E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	8,58E-02	0,00E+00
Ecotoxicity (freshwater)	CTUe	3,17E+01	6,66E+00	0,00E+00	3,83E+01	4,34E+01	1,95E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,80E+01	0,00E+00
Human toxicity, cancer	CTUh	4,15E-09	3,53E-10	0,00E+00	4,51E-09	2,30E-09	1,42E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,22E-09	0,00E+00
Human tox. non-cancer	CTUh	4,98E-08	1,99E-08	0,00E+00	6,98E-08	1,30E-07	2,53E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,44E-08	0,00E+00
SQP[7]	-	5,07E+04	3,20E+01	0,00E+00	5,07E+04	2,09E+02	1,33E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,65E+02	0,00E+00

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	4,68E+03	4,46E-01	0,00E+00	4,68E+03	2,91E+00	1,20E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-6,43E+03	0,00E+00
Renew. PER as material	MJ	4,10E+03	0,00E+00	0,00E+00	4,10E+03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,10E+03	0,00E+00
Total use of renew. PER	MJ	8,78E+03	4,46E-01	0,00E+00	8,78E+03	2,91E+00	1,20E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-1,05E+04	0,00E+00
Non-re. PER as energy	MJ	1,47E+02	3,21E+01	0,00E+00	1,79E+02	2,09E+02	1,92E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,11E+02	0,00E+00
Non-re. PER as material	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
Total use of non-re. PER	MJ	1,47E+02	3,21E+01	0,00E+00	1,79E+02	2,09E+02	1,92E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,11E+02	0,00E+00
Secondary materials	kg	1,13E-01	1,34E-02	0,00E+00	1,26E-01	8,76E-02	7,97E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,83E-02	0,00E+00
Renew. secondary fuels	MJ	7,17E-04	1,75E-04	0,00E+00	8,92E-04	1,14E-03	2,09E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,73E-04	0,00E+00
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	m^3	2,84E-02	4,60E-03	0,00E+00	3,30E-02	3,00E-02	1,16E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-1,70E+00	0,00E+00

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	1,70E+00	2,05E-01	0,00E+00	1,90E+00	1,34E+00	6,24E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,63E-01	0,00E+00
Non-hazardous waste	kg	8,82E+00	4,05E+00	0,00E+00	1,29E+01	2,65E+01	3,11E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,22E+03	0,00E+00
Radioactive waste	kg	7,23E-05	6,43E-06	0,00E+00	7,87E-05	4,20E-05	1,89E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,04E-05	0,00E+00

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	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
Materials for recycling	kg	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
Materials for energy rec	kg	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
Exported energy	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
Exported energy – Electricity	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
Exported energy – Heat	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

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_2e	1,11E+01	2,24E+00	0,00E+00	1,34E+01	1,46E+01	1,47E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,14E+01	0,00E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	1,25E-07	2,61E-08	0,00E+00	1,51E-07	1,70E-07	1,81E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,08E-07	0,00E+00
Acidification	kg SO_2e	4,49E-02	5,96E-03	0,00E+00	5,09E-02	3,89E-02	9,29E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,53E-02	0,00E+00
Eutrophication	kg PO_4^3e	1,26E-02	1,61E-03	0,00E+00	1,42E-02	1,05E-02	2,22E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,46E-02	0,00E+00
POCP (“smog”)	kg C_2H_4e	8,60E-03	5,19E-04	0,00E+00	9,12E-03	3,39E-03	6,99E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,81E-03	0,00E+00
ADP-elements	kg Sbe	2,61E-05	6,26E-06	0,00E+00	3,23E-05	4,09E-05	5,23E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,38E-06	0,00E+00

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	1,42E+02	3,17E+01	0,00E+00	1,73E+02	2,07E+02	1,91E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,10E+02	0,00E+00

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_2e	1,12E+01	2,25E+00	0,00E+00	1,34E+01	1,47E+01	1,48E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,01E+00	0,00E+00

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

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry, >32 metric ton, diesel, EURO 5, 287.21 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	100
Bulk density of transported products	460
Volume capacity utilization factor	1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	Diesel B7 Well to Wheel EcoInvent is 74,12 MJ per declared unit over a weighted distance of 287.21 km
Water use (m^3)	-
Ancillary materials: type and mass (kg)	-
Waste materials: type and mass (kg)	-
Waste materials: output routes	-
Direct emissions (kg)	-

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	--
Collection process: Mixed waste (kg)	-
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	--

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

Afzal khan Peerukhan as an authorized verifier for EPD Hub Limited 22.10.2026

