ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

N10 Negative carbon brick
earth4Earth technology Ltd

EPD HUB, HUB-3866
Publishing date 31 August 2025, last updated on 31 August 2025, valid until 30 August 2030.

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (5 Dec 2023) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	earth4Earth technology Ltd
Address	Xingguang Changwei Industry Park, Caidian District, Wuhan City, Hubei Province, China
Contact details	info@earth4earth.co.uk
Website	https://earth4earth.co.uk/

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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-B1, and modules C1-C4, D
EPD author	Yan Geng earth4Earth
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

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	N10 Negative carbon brick
Additional labels	-
Product reference	-
Place(s) of raw material origin	China
Place of production	Wuhan, Hubei, China
Place(s) of installation and use	United Kingdom
Period for data	Calendar year 2024
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 (%)	86.2

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of brick
Declared unit mass	3.0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	5.39E-02
GWP-total, A1-A3 ($kgCO_2e$)	8.32E-03
Secondary material, inputs (%)	0.02
Secondary material, outputs (%)	100
Total energy use, A1-A3 (kWh)	0.35
Net freshwater use, A1-A3 (m^3)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

As scientists and engineers, we recognise the greatest threat facing humanity today is climate change. In 2023 we founded earth4Earth to develop a practical solution to combatting global carbon emissions. Our innovative materials transform buildings into CO_2 absorption systems, helping to mitigate global warming and protect our planet.

PRODUCT DESCRIPTION

Our earth-based bricks absorb CO_2 throughout their life cycle and can be returned to the soil at end of life. Their properties are superior or comparable with commonly used building materials.
This provides a practical and efficient solution to reaching net zero and even enables construction projects to become carbon negative. Our earth-based bricks are made using excavated soil, which would otherwise go to landfill. Lime is used as a binder/stabiliser to enhance the mechanical properties and durability of our bricks. Whilst conventional lime is produced at high temperatures, releasing significant CO_2 emissions, earth4Earth has developed a novel process for lime production where no direct CO_2 emissions are released.
At end of life, our bricks can be crushed and returned to the earth for crop growth.
The bricks are UKCA-marked (No.IN-SH-CP-5627-24439) /CE-marked (No.IN-SH-CP-5627-24438) and meets EN 771-1 standards with ≥10 MPa compressive strength Suitable for use in structural and non-structural walls in sustainable buildings.

Further information can be found at:
https://earth4earth.co.uk/

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

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	0.0134182

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of brick
Mass per declared unit	3.0 kg
Functional unit	-
Reference service life	100 years

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	x	MND	MND	MND	MND	MND	MND	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

Modules not declared = MND. Modules not relevant = MNR

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 environmental impacts considered for the product stage cover the manufacturing of 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. There is no manufacturing waste.

a) Transport assumptions and distances for materials:

Raw materials are sourced locally in China, with average transport distances as follows:

Recycled clay soil: 24 km

Sand: 15 km

Lime: produced onsite (0 km)

Transport is by truck (Transport, freight, market dataset used in OCLCA).

b) Production losses considered:

There are no significant production losses or manufacturing waste generated during the A3 process. Any minor residual material (e.g., offcuts, powder) is fully collected and internally recycled back into the production process.

c) Manufacturing process:

The process includes:

Mixing of raw materials

Moulding via compression

Low-temperature curing (no kiln firing)

Onsite quality control and visual inspection

No final coating, painting, or finishing is applied.

d) Energy sources profile:

Electricity used in manufacturing is sourced from the Chinese national grid, with green energy certificate applied. Electricity consumption is based on monitored data from the pilot production line.

e) Packaging and ancillary materials used:

The product is packaged on wooden pallets (approx. 25 kg per pallet), wrapped in LDPE plastic film, and secured with polypropylene strapping. Additional protective packaging includes kraft paper air bags and low-density PE film to prevent breakage during transport. The packaging materials are modelled per kilogram of product using national average datasets.
f) Assumptions for EoL for A3 manufacturing waste:
All production waste generated during manufacturing (e.g., broken bricks, dust, trimmings) is 100% recycled onsite. The waste is crushed and reused as soil conditioning material or backfill for planting, in alignment with the product's circular end-of-life principles. No landfill or external waste treatment is required.
g) Transport assumptions and distances for A3 waste:
As all manufacturing waste is fully reused onsite, no transportation is required for A3 waste.
The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

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.

Transportation impacts that occurred from final product delivery to the 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 the PCR. The total distance of transportation for both sea and road from the production plant to the installation site is 2168km and is based on the data published by Carrier Logistics. These documents and their background reports include industry consensus estimates of the resource use, emissions and affluent of typical European installations; these parameters have been used as input for the earth4Earth EPD modelling.
The product is transported from the manufacturing facility to the construction site via two transport legs: 5 km by road (truck transport) and 2163 km by sea freight, resulting in a total transport distance of 2168 km.
No material losses are assumed during installation (0% loss).
Installation requires the use of mortar, with an average consumption of 0.2 kg of mortar per declared unit (brick).
No energy consumption during installation.
A small quantity of packaging waste is generated during installation, assumed to be 0.5% of the declared unit mass.
Packaging waste is assumed to be transported 50 km by road to the nearest waste treatment facility.
The waste is treated as follows: 50% incinerated and 50% recycled, based on EPD Hub PCR guidance and typical European practice.

PRODUCT USE AND MAINTENANCE (B1-B7)

B1 e4E lime is used to absorb co2 from air. 0.1784Kg co2 can be absorbed per brick.
During the use stage, carbonation of the lime component in the brick is assumed to result in CO_2 absorption.
Based on literature values, it is estimated that each brick absorbs approximately 0.1784 kg CO_2 over the course of its use phase. Carbon Capture:
• Ca(OH)2+CO2=CaCO3+H2O
N10 brick has 10% lime, therefore, 1kg brick has 0.1kg lime Ca(OH)2. It can absorb 0.1kg * 44.01/74.1= 0.059kg CO2.
0.059kg co2 absorption is for 1kg, but our brick is 3kg. Therefore, one brick absorb co2 is 0.059kg x 3 = 0.1784kg CO2.

The absorption is assumed to occur gradually over the Reference Service Life (RSL) of 100 years.

Calculations in the OCLCA model are based on this RSL and declared unit (1 brick), and the quantity field reflects full CO_2 uptake over the RSL.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Components made of clay can be deconstructed and recycled. The clay is first crushed, separated into individual grain fractions, and then reused as garden soil.

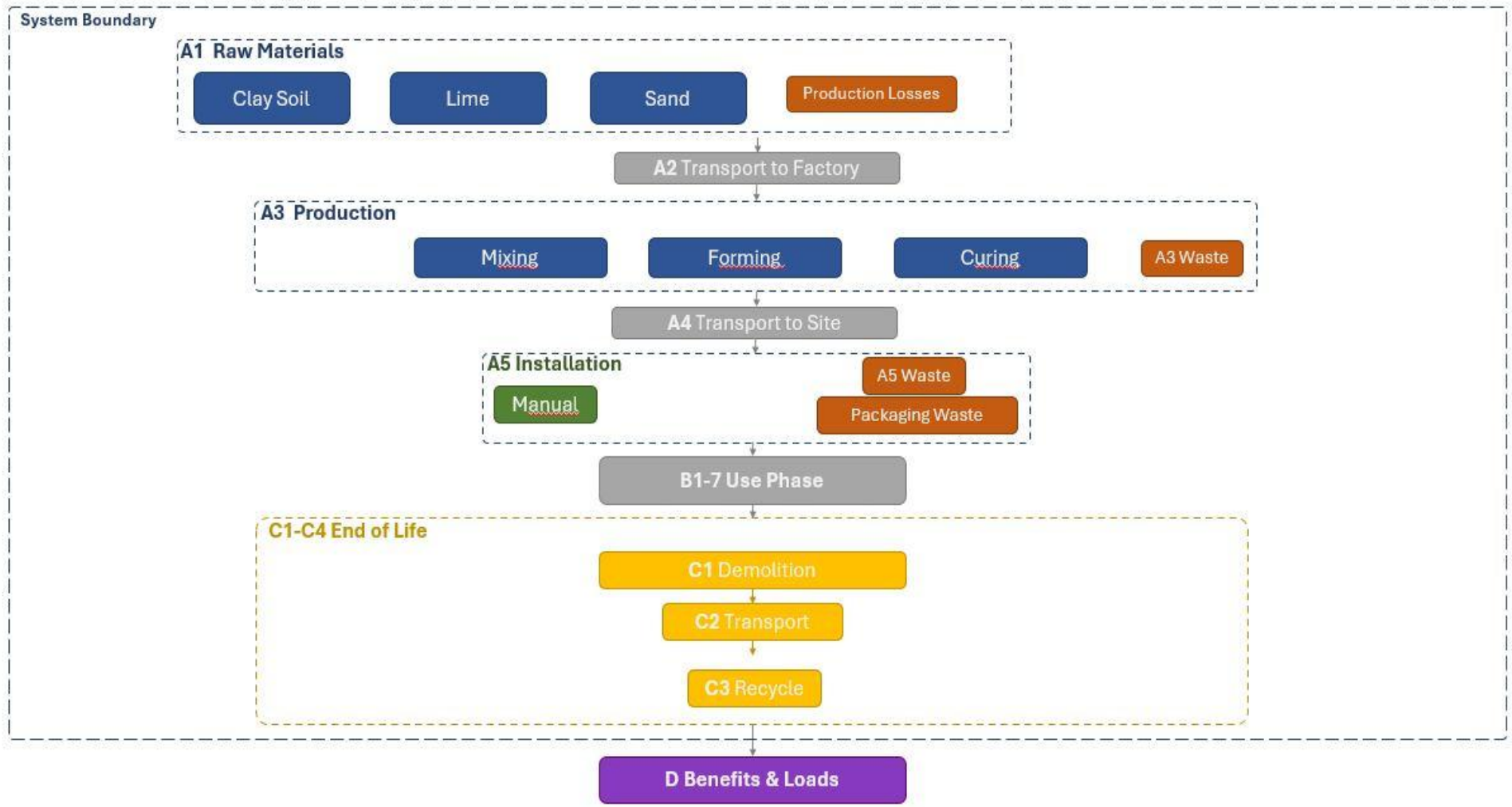
At the end of its service life, the product is removed manually or using light mechanical tools, with negligible energy consumption (C1) which is included in data point in C3.

The product is not transported to external waste processing facilities; instead, it is 100% recycled on-site (C3) through mechanical crushing.

The crushed material is reused locally as a soil conditioner or planting substrate, aligned with its carbon-negative and non-toxic nature.
No landfill is assumed (C4 = 0%).
As the recycled material replaces conventional soil additives and eliminates the need for transport and virgin resource extraction, Module D accounts for environmental benefits.

Soil is already recycled, so the benefit is only from packaging and the e4E lime.

MANUFACTURING PROCESS



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

PRODUCT & MANUFACTURING SITES GROUPING

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

This EPD is product and factory specific.

LCA SOFTWARE AND BIBLIOGRAPHY

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

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	2.89E-02	5.69E-03	-2.63E-02	8.32E-03	6.82E-02	6.25E-02	-1.78E-01	MND	MND	MND	MND	MND	MND	1.08E-02	0.00E+00	1.08E-02	0.00E+00	-3.96E-03
GWP – fossil	kg CO_2e	2.89E-02	5.69E-03	1.93E-02	5.39E-02	6.82E-02	3.35E-03	0.00E+00	MND	MND	MND	MND	MND	MND	1.08E-02	0.00E+00	1.08E-02	0.00E+00	-3.53E-03
GWP – biogenic	kg CO_2e	2.35E-05	1.26E-06	-4.57E-02	-4.57E-02	1.07E-05	5.91E-02	-1.78E-01	MND	MND	MND	MND	MND	MND	1.10E-06	0.00E+00	-1.10E-06	0.00E+00	-4.34E-04
GWP – LULUC	kg CO_2e	1.92E-05	2.53E-06	3.67E-05	5.85E-05	3.67E-05	1.72E-06	0.00E+00	MND	MND	MND	MND	MND	MND	1.11E-06	0.00E+00	1.10E-06	0.00E+00	2.31E-06
Ozone depletion pot.	kg CFC_{-11}e	3.21E-10	8.45E-11	3.34E-10	7.39E-10	9.80E-10	1.89E-11	0.00E+00	MND	MND	MND	MND	MND	MND	1.66E-10	0.00E+00	1.65E-10	0.00E+00	-1.89E-10
Acidification potential	mol H^+e	2.28E-04	3.27E-05	9.95E-05	3.60E-04	1.97E-03	6.55E-06	0.00E+00	MND	MND	MND	MND	MND	MND	9.76E-05	0.00E+00	9.73E-05	0.00E+00	-9.38E-06
EP-freshwater[2)]	kg Pe	6.33E-06	4.42E-07	4.85E-06	1.16E-05	2.21E-06	3.05E-07	0.00E+00	MND	MND	MND	MND	MND	MND	3.12E-07	0.00E+00	3.11E-07	0.00E+00	-8.40E-07
EP-marine	kg Ne	6.99E-05	1.33E-05	2.45E-05	1.08E-04	4.91E-04	6.87E-06	0.00E+00	MND	MND	MND	MND	MND	MND	4.53E-05	0.00E+00	4.52E-05	0.00E+00	-2.04E-06
EP-terrestrial	mol Ne	8.22E-04	1.46E-04	2.65E-04	1.23E-03	5.45E-03	2.67E-05	0.00E+00	MND	MND	MND	MND	MND	MND	4.96E-04	0.00E+00	4.94E-04	0.00E+00	-2.17E-05
POCP ("smog")[3)]	kg NMVOCe	2.32E-04	4.74E-05	1.05E-04	3.84E-04	1.48E-03	8.69E-06	0.00E+00	MND	MND	MND	MND	MND	MND	1.48E-04	0.00E+00	1.47E-04	0.00E+00	-2.17E-05
ADP-minerals & metals[4)]	kg Sbe	3.40E-07	1.58E-08	9.97E-08	4.56E-07	6.92E-08	3.55E-09	0.00E+00	MND	MND	MND	MND	MND	MND	3.88E-09	0.00E+00	3.87E-09	0.00E+00	-3.36E-08
ADP-fossil resources	MJ	3.48E-01	8.31E-02	3.31E-01	7.61E-01	8.38E-01	1.63E-02	0.00E+00	MND	MND	MND	MND	MND	MND	1.41E-01	0.00E+00	1.41E-01	0.00E+00	-1.28E-01
Water use[5)]	m^3e depr.	2.52E-02	4.06E-04	4.30E+00	4.33E+00	2.39E-03	4.80E-04	0.00E+00	MND	MND	MND	MND	MND	MND	3.53E-04	0.00E+00	3.52E-04	0.00E+00	-4.55E-04

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	4.61E-09	7.04E-10	1.94E-09	7.25E-09	2.17E-09	1.13E-10	0.00E+00	MND	MND	MND	MND	MND	MND	2.77E-09	0.00E+00	2.51E-08	0.00E+00	-2.04E-11
Ionizing radiation[6)]	kBq U235e	7.14E-04	7.16E-05	7.83E-04	1.57E-03	3.86E-04	4.44E-05	0.00E+00	MND	MND	MND	MND	MND	MND	6.27E-05	0.00E+00	6.25E-05	0.00E+00	-2.33E-04
Ecotoxicity (freshwater)	CTUe	8.85E-02	1.17E-02	1.34E-01	2.34E-01	6.33E-02	6.63E-03	0.00E+00	MND	MND	MND	MND	MND	MND	7.79E-03	0.00E+00	7.77E-03	0.00E+00	-6.43E-03
Human toxicity, cancer	CTUh	1.12E-11	1.91E-12	6.29E-11	7.61E-11	1.47E-11	6.55E-13	0.00E+00	MND	MND	MND	MND	MND	MND	1.11E-12	0.00E+00	1.11E-12	0.00E+00	-4.00E-13
Human tox. non-cancer	CTUh	3.76E-10	6.45E-11	1.70E-10	6.11E-10	2.16E-10	3.38E-11	0.00E+00	MND	MND	MND	MND	MND	MND	1.76E-11	0.00E+00	1.76E-11	0.00E+00	-2.53E-11
SQP[7)]	-	3.81E+00	8.25E-02	5.84E+00	9.73E+00	8.62E-02	1.55E-02	0.00E+00	MND	MND	MND	MND	MND	MND	9.91E-03	0.00E+00	9.89E-03	0.00E+00	-6.04E-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	3.69E-02	1.13E-03	5.29E-01	5.67E-01	6.53E-03	-4.69E-01	0.00E+00	MND	MND	MND	MND	MND	MND	8.96E-04	0.00E+00	8.93E-04	0.00E+00	-7.41E-03
Renew. PER as material	MJ	0.00E+00	0.00E+00	3.95E-01	3.95E-01	0.00E+00	-3.95E-01	0.00E+00	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.70E-03
Total use of renew. PER	MJ	3.69E-02	1.13E-03	9.24E-01	9.62E-01	6.53E-03	-8.64E-01	0.00E+00	MND	MND	MND	MND	MND	MND	8.96E-04	0.00E+00	8.93E-04	0.00E+00	-7.11E-04
Non-re. PER as energy	MJ	3.48E-01	8.31E-02	2.41E-01	6.72E-01	8.38E-01	-5.75E-02	0.00E+00	MND	MND	MND	MND	MND	MND	1.41E-01	0.00E+00	1.41E-01	0.00E+00	-1.45E-01
Non-re. PER as material	MJ	0.00E+00	0.00E+00	8.98E-02	8.98E-02	0.00E+00	-8.98E-02	0.00E+00	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.70E-02
Total use of non-re. PER	MJ	3.48E-01	8.31E-02	3.31E-01	7.61E-01	8.38E-01	-1.47E-01	0.00E+00	MND	MND	MND	MND	MND	MND	1.41E-01	0.00E+00	1.41E-01	0.00E+00	-6.82E-02
Secondary materials	kg	6.63E-04	3.50E-05	1.30E-03	1.99E-03	3.98E-04	1.33E-05	0.00E+00	MND	MND	MND	MND	MND	MND	5.88E-05	0.00E+00	5.86E-05	0.00E+00	2.21E-03
Renew. secondary fuels	MJ	5.85E-06	4.43E-07	1.04E-02	1.04E-02	9.66E-07	1.27E-07	0.00E+00	MND	MND	MND	MND	MND	MND	1.54E-07	0.00E+00	1.53E-07	0.00E+00	-1.59E-07
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	6.61E-04	1.22E-05	3.03E-04	9.75E-04	5.87E-05	-4.11E-05	0.00E+00	MND	MND	MND	MND	MND	MND	9.35E-06	0.00E+00	9.33E-06	0.00E+00	-1.31E-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	2.31E-03	1.39E-04	1.57E-03	4.01E-03	1.12E-03	1.24E-04	0.00E+00	MND	MND	MND	MND	MND	MND	1.57E-04	0.00E+00	1.57E-04	0.00E+00	-7.85E-05
Non-hazardous waste	kg	3.78E-02	2.58E-03	4.60E-02	8.64E-02	1.53E-02	7.35E-02	0.00E+00	MND	MND	MND	MND	MND	MND	2.15E-03	0.00E+00	2.14E-03	0.00E+00	-3.37E-02
Radioactive waste	kg	1.75E-07	1.75E-08	1.92E-07	3.84E-07	9.41E-08	1.11E-08	0.00E+00	MND	MND	MND	MND	MND	MND	1.54E-08	0.00E+00	1.53E-08	0.00E+00	-5.90E-08

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	0.00E+00	MND	MND	MND	MND	MND	MND	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	1.11E-02	0.00E+00	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	3.00E+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	0.00E+00	MND	MND	MND	MND	MND	MND	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	6.11E-02	0.00E+00	MND	MND	MND	MND	MND	MND	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	2.57E-02	0.00E+00	MND	MND	MND	MND	MND	MND	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	3.54E-02	0.00E+00	MND	MND	MND	MND	MND	MND	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	1.88E-02	5.66E-03	1.93E-02	4.38E-02	6.79E-02	4.09E-03	0.00E+00	MND	MND	MND	MND	MND	MND	1.08E-02	0.00E+00	1.07E-02	0.00E+00	-3.37E-03
Ozone depletion Pot.	kg $CFC_{-11}e$	1.73E-10	6.74E-11	2.83E-10	5.24E-10	7.78E-10	1.52E-11	0.00E+00	MND	MND	MND	MND	MND	MND	1.31E-10	0.00E+00	1.31E-10	0.00E+00	-1.52E-10
Acidification	kg SO_2e	1.04E-04	2.38E-05	7.93E-05	2.07E-04	1.57E-03	4.86E-06	0.00E+00	MND	MND	MND	MND	MND	MND	6.86E-05	0.00E+00	6.85E-05	0.00E+00	-7.58E-06
Eutrophication	kg PO_4^3e	1.94E-05	5.89E-06	4.29E-04	4.54E-04	1.73E-04	1.80E-06	0.00E+00	MND	MND	MND	MND	MND	MND	1.60E-05	0.00E+00	1.60E-05	0.00E+00	-3.00E-06
POCP (“smog”)	kg C_2H_4e	7.20E-06	1.91E-06	8.63E-06	1.77E-05	7.80E-05	5.59E-07	0.00E+00	MND	MND	MND	MND	MND	MND	5.14E-06	0.00E+00	5.13E-06	0.00E+00	-1.06E-06
ADP-elements	kg Sbe	2.10E-08	1.54E-08	9.68E-08	1.33E-07	6.83E-08	3.42E-09	0.00E+00	MND	MND	MND	MND	MND	MND	3.77E-09	0.00E+00	3.76E-09	0.00E+00	-3.32E-08
ADP-fossil	MJ	2.26E-01	8.20E-02	3.18E-01	6.27E-01	8.32E-01	1.56E-02	0.00E+00	MND	MND	MND	MND	MND	MND	1.40E-01	0.00E+00	1.40E-01	0.00E+00	-1.23E-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_2e	2.89E-02	5.69E-03	1.94E-02	5.40E-02	6.82E-02	3.36E-03	0.00E+00	MND	MND	MND	MND	MND	MND	1.08E-02	0.00E+00	1.08E-02	0.00E+00	-3.52E-03

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

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, hydro, run-of-river (Reference product: electricity, high voltage)
Electricity CO2e / kWh	0.0047
District heating data source and quality	-
District heating CO2e / kWh	-

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	0.01045006047
Average transport distance, km	2228.4
Capacity utilization (including empty return) %	100%
Bulk density of transported products	2100
Volume capacity utilization factor	1

Installation scenario documentation A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	0.2
Water use / m^3	0
Other resource use / kg	0
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	0
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	0.0036
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	0.0018
Direct emissions to ambient air, soil and water / kg	0

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	0
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	3kg
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	0
Scenario assumptions e.g. transportation	100km from construction site to reuse or recycling

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

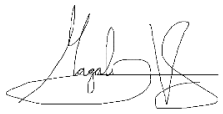
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
31.08.2025



VERIFIED ISO 14025