



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Goxhill - Production Line G3
Wienerberger Limited

EPD HUB, HUB-4620

Publishing date 19.01.2026, last updated on 19.01.2026, valid until 18.01.2031.

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	Wienerberger Limited
Address	wienerberger House, Brooks Drive, Cheadle Royal Business Park, Cheshire SK8 3SA United Kingdom
Contact details	wbukmarketing@wienerberger.com
Website	www.wienerberger.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 1.2, 24 Mar 2025 EN 16757 Product Category Rules for concrete and concrete elements
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	Aaminah Nisa, Wienerberger Limited
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Magaly Gonzalez Vazquez 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	Goxhill - Production Line G3
Additional labels	Double Pantile (in Antique 2, Brown, Dark grey, Dark heath, Mottled red, Rustic, Terracotta red); Double Roman tile (in Antique 2, Brown, Dark grey, Dark heath, Mottled red, Rustic, Terracotta red); Lindum tile (in Antique 2, Brown, Dark grey, Mottled Red, Rustic, Terracotta red)
Product reference	-
Place(s) of raw material origin	United Kingdom
Place of production	Goxhill Tileries, Neatgangs Lane, Goxhill, Doncaster DN19 7EN United Kingdom
Place(s) of installation and use	United Kingdom
Period for data	01/01/2022 - 31/12/2022
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	76.3

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO₂e)	2.07E+02
GWP-total, A1-A3 (kgCO₂e)	1.70E+02
Secondary material, inputs (%)	0.2
Secondary material, outputs (%)	94.3
Total energy use, A1-A3 (kWh)	412
Net freshwater use, A1-A3 (m³e)	23.9

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Wienerberger Ltd is a provider of wall, roof and landscaping innovations, offering outstanding, sustainable solutions for new build and renovation. In the UK, we have head offices located in Cheadle and Doncaster, showrooms in London, Belfast and Surrey, with brick and roof tile production sites in Manchester, Durham, Worcestershire, North Warwickshire, West Midlands, North Kent, Surrey and West Sussex.

PRODUCT DESCRIPTION

Roof tiles provide weather protection in building projects, installed mainly on the roof and occasionally on the façade. In a typical roof element, below the roof tile there are usually wooden battens, followed by a membrane or roof felt, fixed to the joist of a timber frame structure. The roof element may be finished in a warm or cold roof design, with or without a living space.

wienerberger produces 179 concrete roof tiles and fittings. Products include pantiles, double pantiles, double roman tiles, standard pattern tiles, plain tiles and ornamental tiles in a range of reds, browns and greys with either smooth or sand-faced finishes.

This LCA covers large format concrete roof tile products manufactured on the production line G3 at Goxhill Tileworks in 2022. Products in scope of this LCA are listed below. It is based on actual production datasets from 2022.

Double Pantile (in Antique 2, Brown, Dark grey, Dark heath, Mottled red, Rustic, Terracotta red); Double Roman tile (in Antique 2, Brown, Dark grey, Dark heath, Mottled red, Rustic, Terracotta red); Lindum tile (in Antique 2, Brown, Dark grey, Mottled Red, Rustic, Terracotta red).

Goxhill G3 concrete roof tile product weights range from 4.19 kg to 4.72 kg. The average weight for the Goxhill G3 concrete roof tile products is 4.52 kg (mean) and 4.65 kg (median).

All UK manufactured concrete roof tiles are produced according to the requirements of BS EN 490 Concrete roofing tiles and fittings for roof covering and wall cladding - product specifications.

Further information can be found at www.wienerberger.co.uk.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	-
Minerals	100	Sand: UK; Cement: UK & Greece
Fossil materials	-	-
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	10.04

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	70 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	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

Modules not declared = ND. 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 primary ingredient for concrete roof tile manufacturing is sand and crushed concrete acting as a sand replacement, followed by cement. Manufacturing lines at wienerberger’s UK tileworks are supplied with raw materials that are transported to the factory by boat and road.

Incoming raw materials are stocked at the factory. During roof tile production, raw materials are moved from the stocking bays to a mixer. During mixing, the other ingredients are added alongside water to create a malleable material. The material is then extruded under pressure and cut into segments, forming the shape of individual roof tiles.

Once shaped, paint and/or sand may be added to the roof tile surface, before being transferred to a curing chamber. After curing, the roof tiles are packaged and stored in the stockyard ready for onward distribution. All tile scrap waste is reprocessed on site and put back into the process as sand replacement.

In this LCA the packaging materials are included as a material input A3 and the impact of waste treatment of packaging is allocated in A5. The packaging materials modelled are timber pallets, LDPE for plastic wrap and PP and PET for strapping labels.

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 product delivery to the construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Concrete roof tiles manufactured by Goxhill G3 are either delivered directly to a construction site, to a merchant yard, or collected by the customer. Wienerberger used actual transport delivery data to calculate delivery distances, which averaged 223.2 km in 2022. Deliveries are made by Heavy Goods Vehicle, the impact of the vehicle transporting products is modelled using *Ecoinvent 3.10.1 dataset: transport, freight, lorry >32 metric ton, EURO6*.

The packaging is removed during product installation on roofs, so the impact of waste treatment for packaging materials is allocated in A5.

Packaging waste processing¹, assuming 15 km to nearest facility:

Wood – 57.3% recycled; 42.7% landfill

Plastic – 53.7% recycled; 46.3% landfill

A 5% installation loss was applied. Roof tiles are usually installed by hand on-site and are either dry fixed or wet fixed onto the roof. The impact of the fixing method is not included in this LCA.

¹ [UK statistics on waste packaging - GOV.UK](#)

² [BRE PCR PN 514 Rev 3.1.](#)

PRODUCT USE AND MAINTENANCE (B1-B7)

B1 Use: Tiles do not emit any emissions to air during their use, so this module is not relevant.

B2 Maintenance: Once installed, tilework requires no maintenance for a minimum of 60 years. The most common maintenance required after this time is the repointing of mortar, impacts are negligible.

B3 Repair: It is assumed that the tile should not need any repair during its reference service life of 70 years² or the study period, so impacts are negligible.

B4 Replacement: The reference service life of the tile extends beyond the 60-year study period and likely life of the building so no replacements are expected.

B5 Refurbishment: It has been assumed that no refurbishment action that relates to the tile will be required during the 60-year study period.

B6 Operational Energy Use: No energy is consumed during operation, so this module is not relevant.

B7 Operational Water Use: No water is consumed during operation, so this module is not relevant.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life stage, roof tiles can be removed, the individual roof tiles can be cleaned, sorted, and reused. Alternatively, the roof tiles can be removed and crushed into aggregate. The aggregate then follows the typical disposal route for non-hazardous construction and demolition waste in England, which is 94.3% recovered and 5.7% landfilled³.

³ Defra (2022). [Table 7: Recovery rate from non-hazardous construction and demolition waste, England, 2010–2022 \(million tonnes and % rate\).](#)

C1 End of life deconstruction:

The tilework is demolished, with the impacts from demolition attributed to the whole structure. The impact of demolition allocated to the tiles is considered to be 0.01 kWh/kg which is an average value for all building materials.

C2 End of life transport to waste processing:

The 1000 kg demolished tile is transported 15 km to a waste sorting plant.

C3 Waste processing for reuse, recovery and/or recycling:

Of the 1000 kg arriving at the waste sorting plant, 94.3% is recovered as aggregate material and exits the system boundary. The impact of recovering waste tile and processing to produce recycled aggregate is modelled using *Ecoinvent 3.10.1 dataset: Treatment of waste concrete, not reinforced, recycling (Reference product: waste concrete, not reinforced)*.

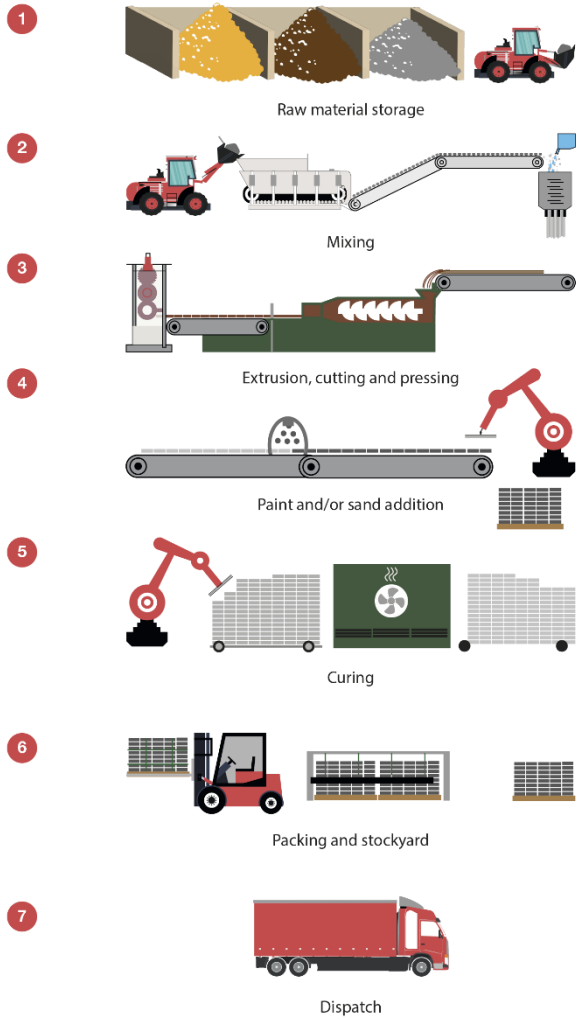
C4 End of life disposal:

For the 5.7% landfilled waste tile material, the impact is modelled using *Ecoinvent 3.10.1 dataset: market for inert waste, for final disposal (Reference product: inert waste, for final disposal)*.

D Benefits and loads beyond the system boundary:

This includes the reuse, recovery and/or recycling potentials, expressed as net impacts and benefits. The 94.3% recycled aggregate material equates to 892 kg of aggregate that can displace virgin aggregate in construction projects. The benefit of this 892 kg secondary aggregate is modelled using the *Crushed concrete aggregate (recycled)* datapoint. The benefits of recycling tile packaging, weight 6.94 kg/tonne of packed product, is also accounted for. Benefits are modelled using *D Cardboard packaging EU scenario; One Click LCA - EI 3.10, D Wood packaging EU scenario; One Click LCA - EI 3.10 and Market for waste polyethylene, for recycling, unsorted (Reference product: waste polyethylene, for recycling, unsorted)*. The benefit of exported energy from incineration is also considered.

MANUFACTURING PROCESS



A1 Raw material supply | A2 Transport | A3 Manufacturing

A4 Transport



A5 Construction & installation

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

C1 Deconstruction & demolition | C2 Transport
C3 Waste processing | C4 Disposal

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	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No grouping
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

This EPD is factory line and product specific for large format roof tiles produced at Goxhill production line G3.

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'.

Defra Table 5: [UK statistics on waste packaging - GOV.UK](#)

Defra (2022). [Table 7: Recovery rate from non-hazardous construction and demolition waste, England, 2010-2022 \(million tonnes and % rate\).](#)

Reference Service life: [BRE PCR PN 514 Rev 3.1.](#)

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	1.82E+02	1.37E+01	-2.61E+01	1.70E+02	2.34E+01	4.90E+01	ND	ND	ND	ND	ND	ND	ND	3.61E+00	1.62E+00	4.13E+00	6.45E-01	-7.61E+00
GWP – fossil	kg CO ₂ e	1.82E+02	1.37E+01	1.05E+01	2.07E+02	2.34E+01	1.23E+01	ND	ND	ND	ND	ND	ND	ND	3.60E+00	1.61E+00	4.13E+00	6.48E-01	-4.55E+00
GWP – biogenic	kg CO ₂ e	4.53E-02	2.82E-03	-3.66E+01	-3.66E+01	5.10E-03	3.66E+01	ND	ND	ND	ND	ND	ND	ND	3.68E-04	3.66E-04	-4.21E-04	-3.66E-03	-3.06E+00
GWP – LULUC	kg CO ₂ e	1.55E-02	7.49E-03	3.06E-02	5.35E-02	9.10E-03	4.33E-03	ND	ND	ND	ND	ND	ND	ND	3.69E-04	7.22E-04	4.23E-04	4.16E-04	-1.13E-03
Ozone depletion pot.	kg CFC _{11e}	5.16E-06	2.00E-07	3.83E-07	5.74E-06	4.88E-07	3.24E-07	ND	ND	ND	ND	ND	ND	ND	5.52E-08	2.38E-08	6.32E-08	1.62E-08	4.06E-08
Acidification potential	mol H ⁺ e	4.95E-01	1.88E-01	5.09E-02	7.34E-01	5.51E-02	4.44E-02	ND	ND	ND	ND	ND	ND	ND	3.25E-02	5.51E-03	3.72E-02	6.90E-03	1.41E-02
EP-freshwater ²⁾	kg Pe	1.43E-02	8.16E-04	-1.25E-02	2.61E-03	1.63E-03	3.55E-04	ND	ND	ND	ND	ND	ND	ND	1.04E-04	1.26E-04	1.19E-04	9.98E-04	-5.17E+00
EP-marine	kg Ne	3.97E-02	4.55E-02	1.35E-02	9.86E-02	1.45E-02	9.37E-03	ND	ND	ND	ND	ND	ND	ND	1.51E-02	1.81E-03	1.73E-02	1.72E-03	1.18E-02
EP-terrestrial	mol Ne	1.79E+00	5.04E-01	1.48E-01	2.44E+00	1.56E-01	1.51E-01	ND	ND	ND	ND	ND	ND	ND	1.65E-01	1.97E-02	1.89E-01	1.85E-02	1.27E-01
POCP (“smog”) ³⁾	kg NMVOCe	4.61E-01	1.52E-01	7.95E-02	6.93E-01	9.59E-02	4.63E-02	ND	ND	ND	ND	ND	ND	ND	4.93E-02	8.11E-03	5.64E-02	6.51E-03	3.95E-02
ADP-minerals & metals ⁴⁾	kg Sbe	3.15E-04	2.83E-05	4.70E-05	3.91E-04	6.68E-05	2.48E-05	ND	ND	ND	ND	ND	ND	ND	1.29E-06	4.50E-06	1.48E-06	1.47E-06	5.60E-07
ADP-fossil resources	MJ	7.29E+02	1.85E+02	2.77E+02	1.19E+03	3.51E+02	8.89E+01	ND	ND	ND	ND	ND	ND	ND	4.72E+01	2.34E+01	5.40E+01	1.42E+01	-6.50E+01
Water use ⁵⁾	m ³ e depr.	2.59E+02	7.85E-01	6.62E+00	2.66E+02	1.80E+00	1.35E+01	ND	ND	ND	ND	ND	ND	ND	1.18E-01	1.16E-01	1.35E-01	7.33E-02	-6.99E-01

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	1.93E-06	9.36E-07	1.02E-06	3.89E-06	2.28E-06	8.15E-07	ND	ND	ND	ND	ND	ND	ND	9.25E-07	1.62E-07	8.07E-06	1.05E-07	7.48E-06
Ionizing radiation ⁶⁾	kBq U235e	7.37E-01	1.36E-01	8.39E-01	1.71E+00	4.23E-01	1.35E-01	ND	ND	ND	ND	ND	ND	ND	2.09E-02	2.04E-02	2.39E-02	1.24E-02	-2.93E-01
Ecotoxicity (freshwater)	CTUe	1.74E+02	2.15E+01	3.82E+01	2.34E+02	4.13E+01	1.67E+01	ND	ND	ND	ND	ND	ND	ND	2.60E+00	3.31E+00	2.97E+00	1.39E+01	6.75E-01
Human toxicity, cancer	CTUh	6.94E-09	2.64E-09	3.58E-08	4.54E-08	3.89E-09	2.70E-09	ND	ND	ND	ND	ND	ND	ND	3.71E-10	2.66E-10	4.24E-10	3.35E-10	-9.09E-08
Human tox. non-cancer	CTUh	1.59E-07	9.03E-08	9.65E-08	3.46E-07	2.27E-07	3.57E-08	ND	ND	ND	ND	ND	ND	ND	5.87E-09	1.52E-08	6.72E-09	1.84E-08	-9.37E-08
SQP ⁷⁾	-	7.85E+02	1.16E+02	2.95E+03	3.85E+03	3.53E+02	2.19E+02	ND	ND	ND	ND	ND	ND	ND	3.30E+00	2.36E+01	3.78E+00	3.31E+01	-3.29E+01

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	5.19E+01	2.19E+00	2.76E+02	3.30E+02	5.71E+00	-1.39E+02	ND	ND	ND	ND	ND	ND	ND	2.99E-01	3.21E-01	3.42E-01	2.08E-01	1.58E+01
Renew. PER as material	MJ	0.00E+00	0.00E+00	3.21E+02	3.21E+02	0.00E+00	-3.21E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E+01
Total use of renew. PER	MJ	5.19E+01	2.19E+00	5.96E+02	6.50E+02	5.71E+00	-4.60E+02	ND	ND	ND	ND	ND	ND	ND	2.99E-01	3.21E-01	3.42E-01	2.08E-01	4.26E+01
Non-re. PER as energy	MJ	7.79E+02	1.85E+02	1.39E+02	1.10E+03	3.51E+02	6.19E+01	ND	ND	ND	ND	ND	ND	ND	4.72E+01	2.34E+01	5.40E+01	1.42E+01	-6.63E+01
Non-re. PER as material	MJ	0.00E+00	0.00E+00	4.19E+01	4.19E+01	0.00E+00	-4.19E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.18E+00
Total use of non-re. PER	MJ	7.79E+02	1.85E+02	1.81E+02	1.14E+03	3.51E+02	2.00E+01	ND	ND	ND	ND	ND	ND	ND	4.72E+01	2.34E+01	5.40E+01	1.42E+01	-6.21E+01
Secondary materials	kg	2.01E+00	8.96E-02	1.23E+00	3.33E+00	1.52E-01	1.81E-01	ND	ND	ND	ND	ND	ND	ND	1.96E-02	9.97E-03	2.24E-02	5.18E-03	3.08E-02
Renew. secondary fuels	MJ	1.47E+01	6.82E-04	1.08E+01	2.55E+01	1.91E-03	1.28E+00	ND	ND	ND	ND	ND	ND	ND	5.12E-05	1.27E-04	5.86E-05	9.68E-05	-1.58E-03
Non-ren. secondary fuels	MJ	2.71E+01	0.00E+00	0.00E+00	2.71E+01	0.00E+00	1.35E+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	2.59E+00	2.20E-02	2.12E+01	2.39E+01	5.18E-02	1.18E+00	ND	ND	ND	ND	ND	ND	ND	3.12E-03	3.46E-03	3.57E-03	-2.11E-01	-1.99E-02

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	4.80E-01	3.03E-01	6.39E-01	1.42E+00	5.08E-01	1.29E-01	ND	ND	ND	ND	ND	ND	ND	5.25E-02	3.97E-02	6.01E-02	2.79E-02	-3.31E-01
Non-hazardous waste	kg	1.56E+01	5.03E+00	2.09E+01	4.15E+01	1.02E+01	2.92E+01	ND	ND	ND	ND	ND	ND	ND	7.15E-01	7.35E-01	8.19E-01	2.84E+02	-4.01E+00
Radioactive waste	kg	9.70E-04	3.32E-05	2.16E-04	1.22E-03	1.05E-04	7.31E-05	ND	ND	ND	ND	ND	ND	ND	5.12E-06	5.00E-06	5.87E-06	3.03E-06	-6.14E-04

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	2.00E+01	2.00E+01	0.00E+00	1.00E+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	5.99E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	9.43E+02	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 ₂ e	1.20E+01	1.37E+01	1.04E+01	3.60E+01	2.32E+01	4.09E+00	ND	ND	ND	ND	ND	ND	ND	3.59E+00	1.61E+00	4.10E+00	6.46E-01	-4.42E+00
Ozone depletion Pot.	kg CFC ₁₁ e	1.64E-06	1.59E-07	3.09E-07	2.10E-06	3.88E-07	1.35E-07	ND	ND	ND	ND	ND	ND	ND	4.37E-08	1.90E-08	5.01E-08	1.29E-08	3.02E-08
Acidification	kg SO ₂ e	4.49E-02	1.51E-01	4.00E-02	2.36E-01	4.37E-02	1.76E-02	ND	ND	ND	ND	ND	ND	ND	2.29E-02	4.20E-03	2.62E-02	5.53E-03	7.75E-03
Eutrophication	kg PO ₄ ³ e	1.15E-02	1.81E-02	2.86E-01	3.16E-01	1.09E-02	1.76E-02	ND	ND	ND	ND	ND	ND	ND	5.34E-03	1.02E-03	6.12E-03	1.52E-03	3.49E-03
POCP (“smog”)	kg C ₂ H ₄ e	2.80E-03	8.22E-03	6.54E-03	1.76E-02	4.46E-03	1.46E-03	ND	ND	ND	ND	ND	ND	ND	1.71E-03	3.75E-04	1.96E-03	3.66E-04	4.24E-04
ADP-elements	kg Sbe	2.85E-04	2.77E-05	4.60E-05	3.59E-04	6.53E-05	2.31E-05	ND	ND	ND	ND	ND	ND	ND	1.26E-06	4.39E-06	1.44E-06	1.42E-06	6.47E-07
ADP-fossil	MJ	1.67E+02	1.83E+02	2.72E+02	6.22E+02	3.44E+02	5.96E+01	ND	ND	ND	ND	ND	ND	ND	4.68E+01	2.31E+01	5.36E+01	1.40E+01	-6.07E+01

ENVIRONMENTAL IMPACTS – 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	1.82E+02	1.37E+01	1.05E+01	2.07E+02	2.34E+01	1.23E+01	ND	ND	ND	ND	ND	ND	ND	3.61E+00	1.62E+00	4.13E+00	6.48E-01	-4.55E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

SCENARIO DOCUMENTATION

TRANSPORT SCENARIO DOCUMENTATION A4

Scenario parameter	Value
Electricity data source and quality	<ol style="list-style-type: none"> Electricity production, photovoltaic, 570kWp open ground installation, multi-Si, United Kingdom, Ecoinvent Electricity production, wind, >3MW turbine, onshore, United Kingdom, Ecoinvent Electricity production, wind, 1-3MW turbine, offshore, United Kingdom, Ecoinvent Market for kerosene
Electricity CO ₂ e / unit	<ol style="list-style-type: none"> 0.0829 CO₂e / kWh 0.0235 CO₂e / kWh 0.0144 CO₂e / kWh 0.93 CO₂e / kg

TRANSPORT SCENARIO DOCUMENTATION A4

Scenario parameter	Value
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Fuel and vehicle type. Eg, electric truck, diesel powered truck	Diesel lorry >32 metric ton, EURO6
Average transport distance, km	223.2
Capacity utilization (including empty return) %	50
Bulk density of transported products	-
Volume capacity utilization factor	1

INSTALLATION SCENARIO DOCUMENTATION A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg	-
Water use / m ³	-
Other resource use / kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	-
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	52.36 kg (tile waste)

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	6.94 kg (packaging waste recycled) 5.2 kg (packaging waste landfill)
Direct emissions to ambient air, soil and water / kg	-

END OF LIFE SCENARIO DOCUMENTATION C1-C4

Scenario information	Value
Average transport distance to nearest disposal site, km	15
C1: Diesel, burned in building machine, Ecoinvent	0.01 kWh
C2: Transported mass, kg	1000
C3: Recovery process – kg for recycling	943
C3: Recovery process – kg for re-use	-
C3: Recovery process – kg for energy recovery	-
C4: Disposal (total) – kg for final deposition	57

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

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
19.01.2026

