Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Northcot Clay Bricks

EPD of multiple products, based on the average results of the product group covering all Clay Bricks produced at the manufacturing site. 65 – modern, 73 – traditional, and handmade.

Programme: The International EPD System, www.environdec.com

Programme Operator: EPD International AB

EPD Registration Number: EPD-IES-0028131:001

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General Information

This EPD provides environmental performance indicators for all Clay Bricks produced by Northcot Brick Ltd at its singular manufacturing site. This is a cradle-to-gate with modules C1-C4 and module D (type a) lifecycle assessment in accordance with the requirements of EN 15804. This EPD is based on a life cycle assessment (LCA) study completed with data provided by Northcot Brick Ltd (hereafter, Northcot) based on production data obtained for the 2024 calendar year at Station Rd, Blockley, Moreton-in-Marsh GL56 9LH. This EPD presents details of the LCA completed by Tunley Environmental for Northcot.

The EPD owner has sole ownership, liability, and responsibility of the EPD. EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Table 1. Full details on the EPD programme and accountabilities.

Programme Information	
EPD programme	The International EPD® System
EPD Programme Operator	EPD International AB, Box 21060, SE-10031 Stockholm, Sweden www.environdec.com - support@environdec.com
Accountabilities for PCR, LCA and independent, third-party verification	
Product Category Rules	CEN Standard EN 15804 serves as the core Product Category Rules (PCR). Product Category Rules (PCR) 2019:14, Version 2.0.1 UN CPC Code 373 Refractory products and structural non-refractory clay products
PCR Review Conducted by	The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Chair of the PCR review: Claudia A. Peña
LCA Conducted by	Tunley Environmental – www.tunley-environmetnal.com
LCA software	SimaPro version 9.6.0.1
Background data from	Ecoinvent 3.9.1 using EF 3.1 factors
Third Party Verification	Independent third-party verification EPD and data, according to ISO 14025:2006
Third Party Verifier	Callum Hill, JCH Industrial Ecology Ltd., enquiries@jchindustrial.co.uk
Approved by	The International EPD® System
Procedure	Individual EPD verification without a pre-verified LCA/EPD tool

EPD Owner Information

EPD Owner: Northcot Brick Ltd

Address: Station Rd, Blockley, Moreton-in-Marsh GL56 9LH

Website: https://www.northcotbrick.co.uk/

Contact Information: 01386 700551

Production Sites: One production site. Clay harvested on site. Mixture of machine made and handmade bricks.

Detailed information about the company who own the EPD: Northcot Brick is one of the UK's last remaining independent brickworks, known for its handmade, wire cut, and reclaimed-style bricks. For nearly 100 years, our bricks have been chosen for their rich tones, authentic character, and exceptional quality. From Battersea Power Station to the Damian Hirst Gallery, now Newport Street Gallery. Founded in 1925, Northcot has preserved traditional craftsmanship while embracing modern production and environmental standards. Our Victorian Pan Mill and Hoffman kiln still operate today, creating bricks with natural variation and character that cannot be replicated by mass production.

With advanced brick-matching and weathering capabilities, we supply bespoke solutions for restoration, heritage, and new-build projects across the UK. Our commitment to sustainable production ensures every brick carries both history and a future making Northcot a trusted choice for architects, builders, and conservationists. Over the decades, Northcot has expanded its production to include fully automated wire cut and 'tumbled' reclaimed brick ranges. Its advanced weathering processes enable subtle ageing of bricks, ensuring seamless matches for restoration work or new builds seeking historical authenticity. By marrying modern technology with traditional skill, Northcot can accurately reproduce most regional brick types. This unique capability has made it a trusted partner for National Trust properties, Historic England restorations, and striking contemporary architectural projects alike.

Product Information

Product Name: Northcot Clay Brick

Product Description: The products covered by this EPD are all the clay bricks produced at Northcot Brick at its manufacturing site in the Cotswolds. This covers modern 65 mm bricks, traditional 73 mm bricks, and handmade bricks. The most common dimension of brick produced is 215 mm X 102.5 mm X 65mm.

Product UN CPC Code: 373 - Refractory products and structural non-refractory clay products.

Technical Picture of Product:

Technical Description of Product: Northcot bricks are small rectangular masonry units. They are produced from clay harvested on site sometimes mixed with sand and occasional additives. The units are shaped and then dried and hardened by firing in a kiln. They are designed to provide structural strength and durability while also offering resistance to weather, fire, and wear. This process fuses the mineral particles together, creating a dense and strong material. The surface and body colour of the brick depend on the mineral content of the clay, additives and the conditions under which it is fired.

This product EPD covers all bricks produced by Northcot at their singular manufacturing site. This is a mixture of different bricks in colour, style, composition, etc. A breakdown of bricks produced by three given types is provided in Table 2. This details the production by weight which is monitored daily.

Table 2. Clay brick types, dimensions of finished brick, average weight per brick, and percentage of total production in the 2024 reference year.

Brick Type	65 - Modern	73 - Traditional	Handmade
General dimensions	215 x 102.5 x 65 mm	215 x 102.5 x 73 mm	215 x 102.5 x 65 mm
Mean brick weight (kg)	2.04	2.28	2.21
Percentage of production by weight	62%	26%	12%

Manufacturing And Packaging (A1-A3)

The environmental impacts considered for the product stage covers the manufacturing of raw materials for all new products, as well as all packaging materials and other ancillary materials. The combustion of fuels for transportation of said products is also considered. Additionally, fuels and electricity used by machines in the production processes at the manufacturing facility is included in this stage. The UK electricity factor from EcoInvent was employed (1 kWh Electricity, high voltage {GB}) this gives a GWP-GHG of 0.2909 kg CO_2e/kWh. Combustion emissions for all purchased fuels used in the calcination are covered within this module.

Information on Assembly Process: Raw materials such as sand, barium carbonate, and additives are transported from UK based manufacturing sites to the brick production facility. Clay is harvested on site in the quarry. This is stored in clay piles on site and used directly. The clay and sand are crushed and milled through rollers. This is then mixed with water and other additives. The resulting soft dough is extruded through a column and cut with wire. The bricks are then dried in a drying room. Finally, the dried bricks are fired in a kiln to calcine the materials together and form a ceramic. These bricks are stacked on pallets ready for transportation. Note that pallets are not always used to transport bricks.

This analysis covers all materials (A1), upstream transportation (A2), and manufacturing (A3) of material impact in the above process. Biogenic sequestration is balanced out for the packaging material within this module.

Transportation 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. Installation (A5) emissions are related to consumption-based processes and additional materials required for installation of said products.

Description of Installation Process: Finished brick products are transported in heavy duty vehicles to construction sites. Sometimes pallets are used in transportation. These are typically laid with mortar (sand + cement) to make buildings.

Modules A4 and A5 are not considered by this study as this sits outside of Northcot's direct control or oversight. Therefore, quantification cannot be achieved without heavy assumptions. This is a cradle-to-gate with modules C1-C4 and module D (type a) lifecycle assessment. Therefore, end of life treatment of packaging materials are quantified within C1-C4 instead of A5.

Product Use and Maintenance (B1-B7)

Description of Product Use and Maintenance: Once installed in a construction bricks remain in place until demolition. Mortar is typically replaced on a regular basis, and some washing or painting may be used for aesthetic purposes.

Modules B1-B7 are not considered within this study. Bricks are a passive product and do not have material use phases to be quantified.

End-of-Life (C1-C4, D)

Description of End-of-Life Process: At the end of an asset's life, it is demolished. The bricks used in the asset's construction have several potential avenues for processing. Some are cleaned and reused as bricks, some are crushed and used as aggregate materials, others are sent to landfill. All bricks at end of life require transportation to the relevant place for processing or disposal. Additionally, packaging materials end of life are considered within these modules and not A5. All end-of-life modelling scenarios used are from PCR 2019:14 VERSION 2.0.1.

For module C1 demolition of the bricks is modelled based on the default deconstruction values of 5 kWh per tonne of masonry, tiles, and paver blocks. For module C2 a transport assumption of 80 km is applied to all brick products. Consequently, a split between an assumption of 70% recycling into aggregate and 30% landfilling is applied to the brick product (in line with EN 17160). Modelling scenarios for C3 consequently involve the 70% recycled brick material following loading, mechanical sorting, and crushing processes. Whilst C4 constitutes the compacting of the 30% of the brick material allocated to landfilling.

End of life processes for the packaging materials follow a transportation distance of 130 km is applied to all packaging materials which are assumed to be sent for incineration within module C2. Treatment of other materials is applied at 0.8 kWh/tonne of diesel consumption. Whilst timber additionally has chipping of wood applied at 6 kWh/tonne of diesel consumption. Both of these occur within module C3.

For module D for the 70% recycled brick product applies the benefits of the aggregate product produced replacing the requirement for new aggregate. An assumption of replaced market gravel material is applied. Additionally, to this the benefits and loads of energy recovery from the timber and film materials are modelled based on an energy recovery rate of 22% and the energy content of the materials.

Content Declaration

The materials utilised based on annual input to produce bricks is displayed in Table 3. The main components are clay, sand, barium carbonate, and water. Other additives are used in lower quantities. The packaging composition is provided in Table 4.

Full details on the material subcomponent and packaging composition is provided in Table 3 & Table 4.

Table 3. Full details on all subcomponents and materials the Northcot Clay Brick is composed of.

Components/ Materials	Weight (kg/DU)	Percentage of Input (%)
Clay	1,084.1	75%
Crushed Coal	0.49	0.034%
Sand	30.4	2.1%
Barium Carbonate	1.3	0.091%
Manganese	0.19	0.014%
Anthracite (Tonnes)	12.0	0.84%
PFA - Pulverised fuel fly ash	27.0	1.9%
Water	285.2	20%

Table 4. Full details on the packaging materials used for transporation of the product per declared unit.

Packaging Materials	Weight (kg/DU)	Weight (% of product)	Biogenic material weight (%)	Biogenic material (kg C/DU)
Packaging - Cellulose based plastic	0.18	0.018%	Yes	0.03
Packaging - Recycled Polyethylene	0.09	0.0093%	No	-
Packaging - Timber Pallet	5.88	0.59%	Yes	2.76

Reference Service Life

Bricks are durable long-lasting products. Bricks can last hundreds of years. A minimum service life of 50 years is certain. Industry average is 150 years.

Substances of High Concern

This product contains no identified Substances of Very High Concern according to the limits provided by the European Chemicals Agency.

LCA Information

This covers the information in which the EPD is based upon.

Databases and LCA Software Used

Material and process environmental impact factors were taken from Ecoinvent 3. Calculations were carried out in SimaPro version 9.6.0.1 and Excel.

Declared Unit

The declared unit for this is one tonne of finished brick product after firing in the kiln plus the packaging used.

LCA Scope

This EPD covers the production stages (A1-A3), and end-of-life management stages (C1-C4 & D). Covering all environmental impacts, resource use, waste generated, and output flows as required by EN 15804. Construction stage is not included as this is outside of the direct control of Northcot with no visibility on implementation. Use stage is not included based on no material impacts identified. Module D provides an estimate of the potential benefits that would accrue to a different product system were the product constituents and recycled wastes identified in data for other life cycle modules actually recycled or recovered at current rates and using current technologies.

Table 5. Modes Declared as part of this Environmental Product Declaration.

	Product stage			**Distribution/ installation stage**		**Use stage**							**End-of-life stage**				**Beyond product life cycle**
Module	Raw material supply **A1**	Transport **A2**	Manufacturing **A3**	Transport **A4**	Construction installation **A5**	Use **B1**	Maintenance **B2**	Repair **B3**	Replacement **B4**	Refurbishment **B5**	Operational energy use **B6**	Operational water use **B7**	De-construction demolition **C1**	Transport **C2**	Waste processing **C3**	Disposal **C4**	Reuse-Recovery-Recycling-potential **D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	UK	UK	UK	ND	ND	ND	ND	ND	ND	ND	ND	ND	UK	UK	UK	UK	UK
Share of primary data		92%		ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products		0%		ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites		0%		ND	ND	-	-	-	-	-	-	-	-	-	-	-	-

Declaration of data sources, reference years, data categories, and share of primary data is given in (Table 6). Additionally, the data quality assessment and reasoning are provided extracted from the full data quality assessment process.

Table 6. Process sources databases and share of primary data for A1-A3 GWP-GHG. Data quality assessment from 1 to 5 (excellent to inadequate). Values given for the DQR are rounded up.

Process	Source Type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3	Data Quality Assessment	Data Quality Assessment Reasoning
Calcination of brick in furnace	Database	Ecoinvent v3.9.1	2024 Calendar	Primary	72%	Geographical - 2 - Good Technical - 2 - Good Temporal - 2 - Good	Two furnaces are utilised to produce bricks at a singular location. The data for the fuels used at this site is collected for the 2024 calendar year. Specific suppliers and fuel types were collected for the fuels.
Production of GHG's from clay	Laboratory Analysis	Lucideon UKAS Laboratory	Feb-25	Primary	13%	Geographical - 1 - Excellent Technical - 2 - Good Temporal - 1 - Excellent	One source of clay harvested on site is used in the production of the bricks. Specific GHG release analysis of the clay used in production during the 2024 calendar year was obtained by a UKAS accredited laboratory.
Transportation of materials to site	Database	Ecoinvent v3.9.1	2024 Calendar	Primary and Secondary	0.2%	Geographical - 2 - Good Technical - 2 - Good Temporal - 2 - Good	Transportation routes were designated from the suppliers to the singular manufacturing location. Assumptions for the transportation method and average transportation weight were made. All data collected for the 2024 calendar year.
Site transportation fuels	Database	Ecoinvent v3.9.1	2024 Calendar	Primary	6%	Geographical - 2 - Good Technical - 1 - Excellent Temporal - 1 - Excellent	All fuels used in transportation services on the facility were obtained for the 2024 calendar year. Region specific fuel manufacturing processes were not considered.
Additive used in manufacturing of brick	Database	Ecoinvent v3.9.1	2024 Calendar	Primary	1%	Geographical - 2 - Good Technical - 2 - Good Temporal - 1 - Excellent	All additives used in brick manufacturing were obtained across the assessment year. Due to low input masses these were grouped into general categories of material type e.g. sand to cover all sand materials.
Packaging material used for distribution of product	Database	Ecoinvent v3.9.1	2024 Calendar	Primary and Secondary	0.4%	Geographical - 2 - Good Technical - 3 - Satisfactory Temporal - 2 - Good	Pallet and plastic wrapping material use was extrapolated from the brick output in the 2024 calendar year. Specific suppliers for the plastic wrapping material were used.
	Total share of primary data, of GWP-GHG results for A1-A3				**92%**		

Time Representativeness

The data collected to complete the analysis for the project was obtained in the 2024 calendar year.

Geographical Scope

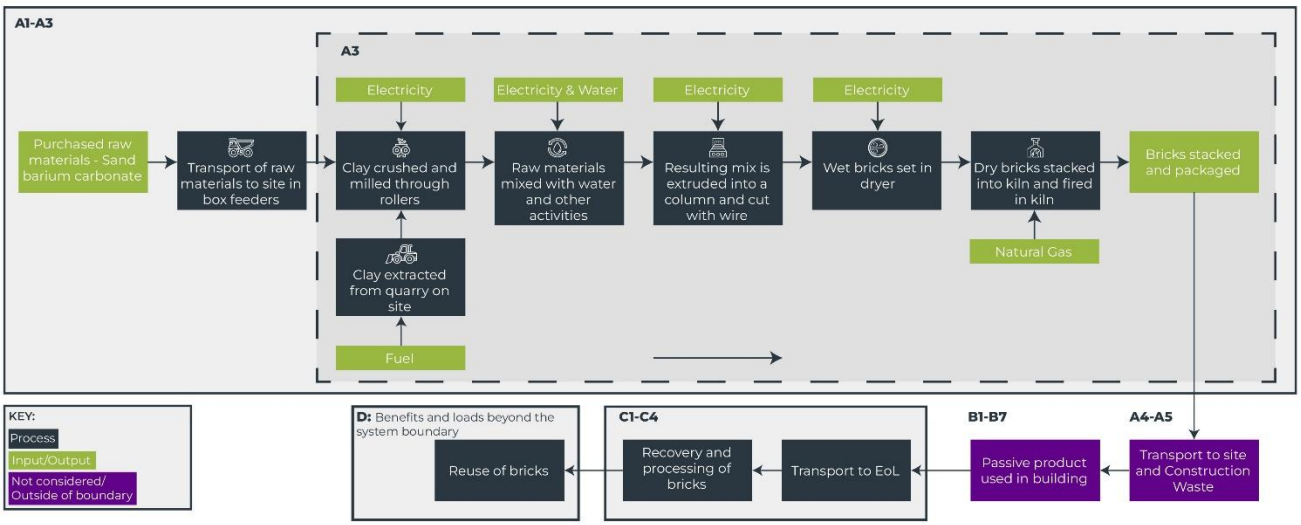
This product is only produced in the United Kingdom as such this is the only geography covered.

System Boundaries

This is a cradle-to-gate with modules C1-C4 and module D (type a) lifecycle assessment. The system boundary of the EPD is defined using the modular approach set out in EN 15804. As well as the core processes, the

system therefore includes production of all raw materials and components from basic resources; transport of those materials at all stages up to the manufacturing facility; the production of fuels and energy carriers and their delivery to manufacturing sites; the treatment of all wastes. Capital equipment in the foreground system is excluded. Non-reusable packaging used to deliver products and/or components to the place of installation is included in the LCA.

The product life cycle covered by this EPD is illustrated below.



Cut-off Criteria

The collected data covered all raw materials, consumables and packaging materials; associated transport to manufacturing sites; process energy and water use; direct production wastes; emissions to air and water.

According to EN 15804 this assessment includes a minimum of 99% of total inflows (mass and energy) per unit process and 95% of total inflows (mass and energy) per life-cycle stages A1-A3, A4-A5 and C1-C4, aggregated modules B1-B5 and B6-B7, and module D. In addition, according to the PCR an expanded 5% cut-off rule of ISO 21930 is applied, which says that at least 95% of the environmental impact per such aggregated module shall be included. These 1% and 5% cut-offs do not include LCI data that are explicitly outside the system boundary.

Data Sources & Data Quality

The producer-specific data used in LCA calculations are based on 1-year averaged data and have been updated within the last 5 years. These data were checked to ensure that sufficient materials and water are included within the inputs to account for all products, wastes and emissions.

Background Data

Background (generic) data from the Ecoinvent database (v3.9.1 using EF 3.1 factors) fulfil the EN 15804 requirement that generic data used in the LCA have been updated within the last 10 years.

The quality of generic data has been reviewed; where necessary, data in the core Ecoinvent 3 database have been adjusted to better reflect available information about Northcot specific supply chain and about processes that contribute significantly to the LCA results.

Other data were judged fit for purpose. No environmental impact potential stemming from proxy data exceeds 10% for any impact category.

Allocation

In the background data, allocation is applied to all processes except those in which secondary materials are used, where the "cut-off" allocation is applied. This ensures that secondary materials are free of upstream burdens that arise prior to their reaching the "end of waste" state, in accordance with Section 6.3.4.2 of EN 15804. No other allocation procedures have been applied in this assessment.

Assumptions & Estimates

Inputs to and outputs from the system are accounted for over a 100-year time period, except for biogenic carbon. Long-term emissions are therefore omitted from the impact assessment part of the LCA, except for biogenic carbon releases from waste disposal to which no time cut-off is applied.

The "primary energy used as material" indicators (PERM; PENRM) are calculated using - as characterisation factors - published values for constituent materials which can yield energy on combustion, where available, and from published calorific values where PEM values are not available.

"Primary energy as fuel" indicators (PENRE, PERE) are calculated as the total primary energy demand minus primary energy used as material.

Electricity used in manufacturing is processes is assumed to be from the UK national grid and inclusive of transmission and distribution losses.

In Module D, benefits and loads are calculated for the net quantity of material recycled or recovered.

The manufacturing weight of brick products is scaled based on the production volume of brick types and their average weight over the reference year.

Pallet use is estimated based on number of bricks produced and application of 600 bricks per pallet. An estimated use rate of 30% is applied.

Plastic packaging wrap is estimated at 0.3 kg per pallet of bricks.

All material inputs are taken as all materials purchased or harvested within the reference year.

The weight of barium carbonate is assumed as at 59 wt.% solution.

Direct release emissions are obtained from third party analysis of the direct release of carbon in both organic and inorganic carbonate form.

Environmental Performance Indicators

This EPD contains environmental information in the form of quantitative indicator values for a number of parameters, which encompass calculated environmental impact potentials, resource and energy use, waste generation and material and energy outputs from the product system that may be reused, recycled or recovered into other, unspecified product life cycles. These parameters are listed below along with the abbreviations used for them in the tables of indicator values that follow.

Table 7. 1 - Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Environmental Impact (EI) Factor (EN 15804:2012 + A2:2019)	Acronym	Unit
Global warming potential - total	GWP-total	kg CO2 eq.
Global warming potential - fossil fuels	GWP-fossil	kg CO2 eq.
Global warming potential - biogenic	GWP-biogenic	kg CO2 eq.
Global warming potential - land use and land use change	GWP-lulus	kg CO2 eq.
Depletion potential of the stratospheric ozone layer	ODP	kg CFC-11 eq.
Acidification potential, accumulated exceedance	AP	mol H^+ eq.
Eutrophication potential - freshwater	EP-freshwater	kg P eq.
Eutrophication potential - marine	EP-marine	kg N eq.
Eutrophication potential - terrestrial	EP-terrestrial	mol N eq.
Photochemical ozone creation potential	POCP	kg NMVOC eq.
Abiotic depletion potential - non-fossil resources	ADPE	kg Sb eq.
Abiotic depletion potential - fossil resources	ADPF	MJ, net calorific value
Water (user) deprivation potential	WDP	m^3 world eq. deprived
Resource Use	**Acronym**	**Unit**
Use of renewable primary energy as energy carrier	PERE	MJ
Use of renewable primary energy resources used as raw materials	PERM	MJ
Total use of renewable primary energy	PERT	MJ
Use of non-renewable primary energy as energy carrier	PENRE	MJ
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ
Total use of non-renewable primary energy resource	PENRT	MJ
Use of secondary material	SM	MJ
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Net use of fresh water	FW	m^3
Waste Generated	**Acronym**	**Unit**
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Output Flows	**Acronym**	**Unit**
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported electrical energy	EEE	MJ
Exported thermal energy	EET	MJ

Additional mandatory impact category indicators declared nomenclature in this assessment are displayed in Table 8.

Table 8. Nomenclature of additional mandatory impact category indicators declared in this assessment.

Environmental Impact (EI) Factor (EN 15804:2012 + A2:2019)	Acronym	Unit
Global warming potential	GWP-GHG	kg CO2 eq.

Environmental Performance Indicator Results

Environmental indicator results for the declared modules are shown in the following tables per 1 tonne of finished brick product plus the packaging used. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3). GWP-biogenic of the packaging material is balanced out in the stage of occurrence. This is accomplished by zeroing the values for biogenic CO_2 emissions for biogenically sourced materials within module A3 (manufacturing) as this is a type a) EPD.

Interpretation

Indicator values obtained for resource depletion (ADPE, ADPF), stratospheric ozone depletion (ODP) and water deprivation (WDP) potential should be used with caution; all are subject to uncertainties in data or method which limit the scope for their use as the basis for comparisons.

Activities upstream in Northcot supply networks contribute strongly to the environmental indicator values reported in this EPD. Evaluation of the data available to represent these activities identified various sources of uncertainty which influence those indicator values. The uncertainty associated with the declared values is considered to be at least +/-10% for the climate change category and is likely higher for other categories.

No untreated wastes leave the modelled system, which includes waste treatment activities as required by EN 15804. The waste indicators HWD, NHWD and TRWD presented in this EPD therefore represent waste flows within the modelled system.

Environmental indicator results are shown in the Table 9 for the 1 tonne of brick product exclusive of packaging; modules A1 - A3 are shown on an aggregated basis.

Table 9. Full environmental impact, resource use, waste generated, and output flow metrics measured for one declared unit of the clay bricks. Declared unit = 1 tonne of brick product, plus the packaging used.

EI Factor	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	6.97E+02	1.87E+00	1.52E+01	1.33E+00	1.80E-01	-1.81E+01
GWP-fossil	kg CO2 eq.	6.97E+02	1.87E+00	1.52E+01	1.32E+00	1.79E-01	-1.81E+01
GWP-biogenic	kg CO2 eq.	1.67E-01	2.57E-03	1.38E-02	2.03E-03	2.47E-04	5.72E-04
GWP-luluc	kg CO2 eq.	1.50E-01	5.08E-04	7.39E-03	7.69E-04	4.87E-05	-1.98E-02
ODP	kg CFC-11 eq.	3.89E-05	2.92E-08	3.31E-07	3.62E-08	2.80E-09	-5.05E-07
AP	mol H+ eq.	2.63E+00	2.29E-02	4.96E-02	1.18E-02	2.20E-03	-7.76E-02
EP-freshwater	kg P eq.	1.61E-01	1.02E-04	1.06E-03	8.83E-05	9.77E-06	-3.63E-03
EP-marine	kg N eq.	7.01E-01	1.02E-02	1.71E-02	5.12E-03	9.83E-04	-1.77E-02
EP-terrestrial	mol N eq.	7.42E+00	1.11E-01	1.80E-01	5.58E-02	1.07E-02	-2.07E-01
POCP	kg NMVOC eq.	2.36E+00	3.10E-02	7.41E-02	1.56E-02	2.97E-03	-6.32E-02
ADPE	kg Sb eq.	4.12E-04	6.53E-06	4.88E-05	3.53E-06	6.26E-07	-6.77E-05
ADPF	MJ, net calorific value	1.41E+04	2.38E+01	2.16E+02	2.29E+01	2.29E+00	-3.38E+02
WDP	m3 world eq. deprived	3.17E+01	5.47E-02	8.79E-01	4.36E-02	5.25E-03	-1.09E+01
Acronym	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3.50E+02	5.08E-04	3.35E+00	1.20E+02	4.87E-05	-5.27E+01
PERM	MJ	1.18E+02	0.00E+00	0.00E+00	-1.18E+02	0.00E+00	0.00E+00
PERT	MJ	4.67E+02	5.08E-04	3.35E+00	2.63E+00	4.87E-05	-5.27E+01
PENRE	MJ	1.53E+04	1.87E+00	2.29E+02	1.72E+01	1.79E-01	-3.59E+02
PENRM	MJ	3.97E+00	0.00E+00	0.00E+00	-3.97E+00	0.00E+00	0.00E+00
PENRT	MJ	1.53E+04	1.87E+00	2.29E+02	1.33E+01	1.79E-01	-3.59E+02
SM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	1.07E+00	2.22E-03	3.07E-02	3.15E-03	2.13E-04	-2.99E-01
Acronym	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	0.00E+00	0.00E+00	0.00E+00	7.06E+02	3.00E+02	-7.00E+02
RWD	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronym	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	7.00E+02	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	6.15E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	5.62E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional mandatory impact category indicators declared in this assessment are displayed in Table 8.

Table 10. Additional mandatory impact category indicators declared in this assessment.

Acronym	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq.	6.97E+02	1.87E+00	1.52E+01	1.32E+00	1.79E-01	-1.81E+01

Additional End-of-Life Scenarios

We present the environmental impacts of the product lifecycle if 100% of the 1 tonne of brick product was sent to landfill (Table 11) or recycled (Table 12).

Table 11. End of life stages (C1-C4, & D) covering the environmental impacts for 100% landfill scenario of bricks.

EI Factor	Unit	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq.	1.87E+00	1.52E+01	1.33E-02	5.98E-01	-1.62E+01
GWP-total	kg CO2 eq.	1.87E+00	1.52E+01	1.33E-02	5.98E-01	-1.62E+01
GWP-fossil	kg CO2 eq.	2.57E-03	1.38E-02	1.83E-05	8.24E-04	0.00E+00
GWP-biogenic	kg CO2 eq.	5.08E-04	7.39E-03	3.60E-06	1.62E-04	-1.92E-02
GWP-luluc	kg CO2 eq.	2.92E-08	3.31E-07	2.07E-10	9.35E-09	-8.13E-07
ODP	kg CFC-11 eq.	2.29E-02	4.96E-02	1.62E-04	7.32E-03	-3.97E-02
AP	mol H+ eq.	1.02E-04	1.06E-03	7.22E-07	3.26E-05	-1.47E-03
EP-freshwater	kg P eq.	1.02E-02	1.71E-02	7.26E-05	3.28E-03	-1.14E-02
EP-marine	kg N eq.	1.11E-01	1.80E-01	7.90E-04	3.56E-02	-1.30E-01
EP-terrestrial	mol N eq.	3.10E-02	7.41E-02	2.20E-04	9.91E-03	-3.76E-02
POCP	kg NMVOC eq.	6.53E-06	4.88E-05	4.63E-08	2.09E-06	-1.69E-05
ADPE	kg Sb eq.	2.38E+01	2.16E+02	1.69E-01	7.62E+00	-4.25E+02
ADPF	MJ, net calorific value	5.47E-02	8.79E-01	3.88E-04	1.75E-02	-6.48E-01
WDP	m3 world eq. deprived	1.87E+00	1.52E+01	1.33E-02	5.98E-01	-1.62E+01

Table 12. End of life stages (C1-C4, & D) covering the environmental impacts for 100% recycling scenario of bricks.

EI Factor	Unit	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq.	1.87E+00	1.52E+01	1.89E+00	0.00E+00	-3.10E+01
GWP-total	kg CO2 eq.	1.87E+00	1.52E+01	1.89E+00	0.00E+00	-3.10E+01
GWP-fossil	kg CO2 eq.	2.57E-03	1.38E-02	2.90E-03	0.00E+00	8.17E-04
GWP-biogenic	kg CO2 eq.	5.08E-04	7.39E-03	1.10E-03	0.00E+00	-3.43E-02
GWP-luluc	kg CO2 eq.	2.92E-08	3.31E-07	5.16E-08	0.00E+00	-9.78E-07
ODP	kg CFC-11 eq.	2.29E-02	4.96E-02	1.68E-02	0.00E+00	-1.23E-01
AP	mol H+ eq.	1.02E-04	1.06E-03	1.26E-04	0.00E+00	-5.65E-03
EP-freshwater	kg P eq.	1.02E-02	1.71E-02	7.28E-03	0.00E+00	-2.89E-02
EP-marine	kg N eq.	1.11E-01	1.80E-01	7.94E-02	0.00E+00	-3.36E-01
EP-terrestrial	mol N eq.	3.10E-02	7.41E-02	2.22E-02	0.00E+00	-1.02E-01
POCP	kg NMVOC eq.	6.53E-06	4.88E-05	5.02E-06	0.00E+00	-1.02E-04
ADPE	kg Sb eq.	2.38E+01	2.16E+02	3.26E+01	0.00E+00	-6.17E+02
ADPF	MJ, net calorific value	5.47E-02	8.79E-01	6.21E-02	0.00E+00	-1.57E+01
WDP	m3 world eq. deprived	1.87E+00	1.52E+01	1.89E+00	0.00E+00	-3.10E+01

References

Ecoinvent database – www.ecoinvent.ch

DS/EN 15804:2012 + A2:2019 – Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

General Program Instructions, Version 5.01, 2025-02-27 - The International EPD® System - EPD International AB

ISO 14001:2015 - Environmental management systems – Requirements with guidance for use

ISO 14025:2009-11 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

PCR 2019:14 - Construction products, version 2.0.1, 2030-04-07 - The International EPD® System - EPD

Annex

The International EPD® System: a programme for Type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. (www.environdec.com).

Life cycle assessment (LCA): LCA studies the environmental aspects and quantifies the potential impacts (positive or negative) of a product (or service) throughout its entire life. ISO standards ISO 14040 and ISO 14044 set out conventions for conducting LCA.

Version History

Original Version of the EPD, 2026-02-09

Abbreviations

Abbreviation	Definition
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern
ND	Not Declared
LCA	Life cycle assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
GHG	Greenhouse Gas
PEF	Product Environmental Footprint
CO_2e	Carbon Dioxide Equivalents
DU	Declared Unit
EI	Environmental Impact
LCI	Lifecycle Inventory
MJ	Megajoule
NMVOC	Non-Methane Volatile Organic Compounds
PFA	Pulverised Fuel Ash
SE	Sweden
UK	United Kingdom
Wt.%	Weight Percent

Electrical Mix Used

The UK electricity factor from EcoInvent was employed (1 kWh Electricity, high voltage {GB}) this gives a GWP-GHG of 0.2909 kg CO_2e/kWh. The shares of electricity technologies on this market are valid for the year 2021. They have been calculated by the data provider and don't correspond with the production volumes entered in the undefined datasets of the different electricity supplying technologies. The shares have been calculated based on statistics from 2021. Grid losses are based on data from 2021. The fuel grid mix provided by the Digest of UK Energy Statistics (DUKES) 2021 is provided in Figure 1.

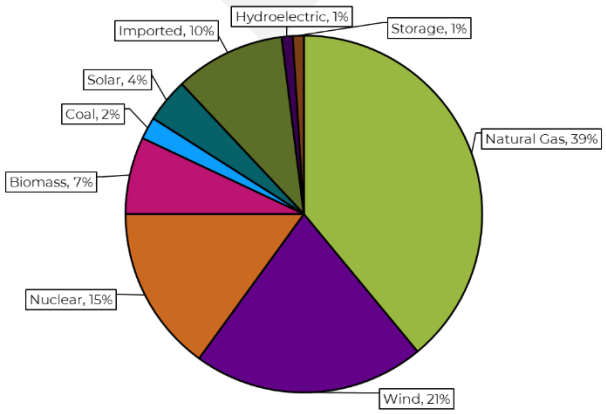


Figure 1. Average fuel grid mix for the UK as at 2021 according to the Digest of UK Energy Statistics (DUKES).