



KINGSCOURT

— BRICK —



Kingscourt Brick

Clay brick

Sand-faced clay brick

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804 + A1
Owner of the Declaration – Breedon Brick Ltd





Declaration number: EPDIE-21-51
Issue date 12th July 2021
Valid to 12th July 2026

EPD Programme - EPD Ireland
Programme Operator - Irish Green Building Council
www.epdireland.org

1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council, 19 Mountjoy Square, Dublin D01 E8P5	Breedon Brick Ltd Kingscourt, Co. Cavan, IRELAND Tel: +353 (0)42 966 7317 Mail: brick@breedongroup.com
DECLARATION NUMBER	PRODUCTION SITE
EPDIE-21-51	Kingscourt Brick, Drumgill, Kingscourt, Co. Cavan
ECO PLATFORM EPD	DECLARED UNIT
Yes	1 tonne of clay brick 1 tonne of sand-faced clay brick
APPLICABLE PRODUCT CATEGORY RULES	DECLARED PRODUCT
EN 15804:2012+A1:2013, EPD Ireland PCR Part A.	Kingscourt Brick products: (1) Clay brick (2) Sand-faced clay brick The service life of the product is 150 years
DATE OF ISSUE	SCOPE OF EPD
12.07.2021	Cradle to grave (A1-C4)
DATE OF EXPIRY	LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA
12.07.2026	EcoReview, Kilkenny, Co. Kilkenny, Ireland, +353 87 258 9783 / +31 646 264 9327 info@ecoreview.ie / www.ecoreview.ie
TYPE OF EPD: SINGLE OR MULTI PRODUCT	LCA SOFTWARE AND DEVELOPER IF APPLICABLE
Single product	Ecochain
PRODUCT CLASSIFICATION OR NACE CODE	NAME AND VERSION OF INVENTORY USED
Clay fired bricks	Ecoinvent version 3.5
COMPARABILITY	
EPD of construction products may not be comparable if they do not comply with EN15804. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+2012+A1:2013	
The CEN Norm /EN 15804 serves as the core PCR	
Independent verification of the declaration according to ISO 14025	

Internally Externally

SIGNATURE OF PROGRAMME OPERATOR	SIGNATURE VERIFIER
Pat Barry - CEO - Irish Green Building Council  	Kim Allbury - Intertek Deutschland GmbH  

2. Scope and Type of EPD

This is a Cradle to Grave EPD. The Modules that are declared are shown in the table below. The geographical scope of this EPD is Europe.

PRODUCT STAGE			CONSTRUCTION ON PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X - Module declared.

MND - Module not declared.

3. Detailed product description

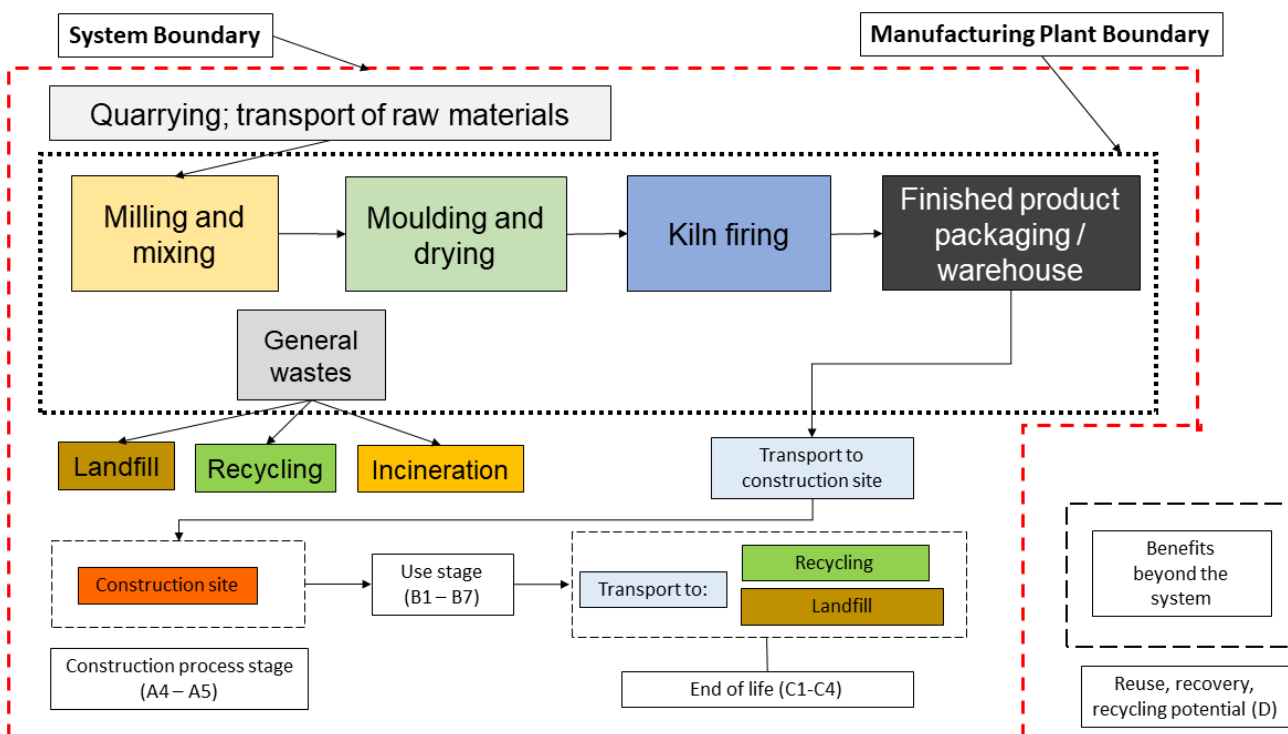
This EPD is carried out for the Kingscourt brick products: (i) clay bricks, and (ii) sand-faced clay bricks. The raw materials for the normal clay bricks are predominantly clay (locally sourced keuper marl) with a minor amount of molasses, and for the sand-faced bricks the raw materials are predominantly clay, with minor amounts of molasses and sand. The bricks are manufactured in accordance with the requirements of I.S. EN 771-1: Specification for masonry units: Clay masonry units. The bricks are primarily used as a facing brick for external walls in standard domestic and commercial construction projects. Bricks and brick slip are also used as internal exposed wall facings for aesthetic effect.

Further technical information can be obtained at <https://kingscourtbrick.com/bricks/>

3.1 Manufacturing Process Description

The main ingredient of the bricks is clay that is quarried at a nearby clay pit and transported to the production site. At the production site the clay is milled and mixed with water and molasses to homogenise and provide a standard consistency. The clay is then formed into moulds that are wire-cut to the required sizes, and then sent to the dryer to drive off excess moisture. After drying, the dried bricks are put in a vitrifying oven for firing. After firing the bricks are left to cool and then stacked where they are covered and banded secure for transport to the customer. A pallet-less system is used in the packaging, storage and transport of the finished goods.

The manufacturing process flowchart is shown below:



4.1 LCA results - Clay brick

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	1.42E+01	4.21E+00	1.93E+02	2.11E+02	3.23E+01	5.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E+00	2.74E+00	1.05E+00	1.62E+01
ODP	[kg CFC11-Eq.]	1.43E-06	7.76E-07	1.92E-05	2.14E-05	5.96E-06	9.49E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-07	4.97E-07	2.86E-07	1.79E-06
AP	[kg SO ₂ -Eq.]	1.18E-01	1.15E-02	3.62E-01	4.92E-01	7.70E-02	1.27E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.53E-03	2.08E-02	7.12E-03	9.31E-02
EP	[kg (PO ₄)-Eq.]	3.51E-02	1.73E-03	7.54E-02	1.12E-01	1.24E-02	2.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.02E-04	4.68E-03	1.32E-03	1.47E-02
POCP	[kg ethene-Eq.]	1.13E-02	2.12E-03	4.36E-02	5.70E-02	1.59E-02	2.51E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.02E-04	2.78E-03	1.01E-03	1.00E-02
ADPE	[kg Sb-Eq.]	2.14E-04	1.27E-05	7.28E-04	9.55E-04	9.86E-05	2.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23E-06	9.24E-07	1.38E-06	9.95E-05
ADPF	[MJ]	2.07E+02	6.44E+01	2.80E+03	3.07E+03	4.94E+02	7.98E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E+01	3.94E+01	2.69E+01	2.36E+02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed

4.1 LCA results - Clay brick

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.03E+02	7.04E-01	3.27E+03	3.37E+03	5.30E+00	9.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-01	2.32E-01	4.17E-01	1.13E+01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.03E+02	7.04E-01	3.27E+03	3.37E+03	5.30E+00	9.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-01	2.32E-01	4.17E-01	1.13E+01
PENRE	[MJ]	2.11E+02	6.89E+01	2.75E+03	3.03E+03	5.28E+02	8.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E+01	4.25E+01	2.86E+01	2.35E+02
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	2.11E+02	6.89E+01	2.75E+03	3.03E+03	5.28E+02	8.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E+01	4.25E+01	2.86E+01	2.35E+02
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	3.03E-01	1.06E-02	2.06E-01	5.20E-01	8.13E-02	1.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.60E-03	5.24E-03	2.71E-02	3.43E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RSF and NRSF are not calculated by the EcoChain software.

4.1 LCA results - Clay brick

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	3.52E-04	4.13E-05	1.79E-02	1.83E-02	3.17E-04	5.75E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-05	1.79E-05	2.07E-05	6.96E-04
NHWD	[kg]	6.81E+00	3.05E+00	2.56E+01	3.55E+01	2.38E+01	3.12E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-01	4.27E-02	1.00E+02	6.23E+00
RWD	[kg]	7.77E-04	4.38E-04	2.45E-03	3.66E-03	3.36E-03	5.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-04	2.78E-04	1.63E-04	1.12E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.2 LCA results - Sand-faced clay brick

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	1.42E+01	4.82E+00	1.93E+02	2.12E+02	3.23E+01	5.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E+00	2.74E+00	1.05E+00	1.62E+01
ODP	[kg CFC11-Eq.]	1.44E-06	8.87E-07	1.92E-05	2.16E-05	5.96E-06	9.49E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-07	4.97E-07	2.86E-07	1.79E-06
AP	[kg SO ₂ -Eq.]	1.18E-01	1.33E-02	3.62E-01	4.93E-01	7.70E-02	1.27E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.53E-03	2.08E-02	7.12E-03	9.31E-02
EP	[kg (PO ₄)-Eq.]	3.48E-02	1.99E-03	7.54E-02	1.12E-01	1.24E-02	2.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.02E-04	4.68E-03	1.32E-03	1.47E-02
POCP	[kg ethene-Eq.]	1.13E-02	2.43E-03	4.36E-02	5.73E-02	1.59E-02	2.51E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.02E-04	2.78E-03	1.01E-03	1.00E-02
ADPE	[kg Sb-Eq.]	2.12E-04	1.44E-05	7.28E-04	9.55E-04	9.86E-05	2.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23E-06	9.24E-07	1.38E-06	9.95E-05
ADPF	[MJ]	2.07E+02	7.36E+01	2.80E+03	3.08E+03	4.94E+02	7.98E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E+01	3.94E+01	2.69E+01	2.36E+02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed

4.2 LCA results - Sand-faced clay brick

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.03E+02	8.07E-01	3.27E+03	3.37E+03	5.30E+00	9.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-01	2.32E-01	4.17E-01	1.13E+01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.03E+02	8.07E-01	3.27E+03	3.37E+03	5.30E+00	9.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-01	2.32E-01	4.17E-01	1.13E+01
PENRE	[MJ]	2.11E+02	7.88E+01	2.75E+03	3.04E+03	5.28E+02	8.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E+01	4.25E+01	2.86E+01	2.35E+02
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	2.11E+02	7.88E+01	2.75E+03	3.04E+03	5.28E+02	8.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E+01	4.25E+01	2.86E+01	2.35E+02
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	3.16E-01	1.21E-02	2.06E-01	5.34E-01	8.13E-02	1.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.60E-03	5.24E-03	2.71E-02	3.43E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RSF and NRSF are not calculated by the EcoChain software.

4.2 LCA results - Sand-faced clay brick

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	3.54E-04	4.72E-05	1.79E-02	1.83E-02	3.17E-04	5.75E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-05	1.79E-05	2.07E-05	6.96E-04
NHWD	[kg]	6.80E+00	3.48E+00	2.56E+01	3.59E+01	2.38E+01	3.12E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-01	4.27E-02	1.00E+02	6.23E+00
RWD	[kg]	7.79E-04	5.01E-04	2.45E-03	3.73E-03	3.36E-03	5.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-04	2.78E-04	1.63E-04	1.12E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

5.1 LCA results - Additional Impact Indicators - Clay Brick

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	1.15E+01	1.62E+00	6.49E+01	7.80E+01	1.24E+01	1.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.71E-01	9.87E-01	5.60E-01	6.55E+00
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.36E-01	4.40E-02	7.50E-01	9.29E-01	3.38E-01	5.04E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-02	1.38E-02	9.50E-03	1.28E-01
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	4.91E+02	1.69E+02	4.02E+03	4.68E+03	1.30E+03	1.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E+01	4.64E+01	3.42E+01	5.30E+02
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	5.26E-02	5.65E-03	2.41E+00	2.46E+00	4.32E-02	7.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-03	1.63E-03	1.48E-03	3.46E-02

Note - MND - Module not declared INA - Indicator not assessed.

5.2 LCA results - Additional Impact Indicators - Sand-faced clay brick

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	1.15E+01	1.85E+00	6.49E+01	7.82E+01	1.24E+01	1.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.71E-01	9.87E-01	5.60E-01	6.55E+00
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.36E-01	5.03E-02	7.50E-01	9.35E-01	3.38E-01	5.04E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-02	1.38E-02	9.50E-03	1.28E-01
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	4.90E+02	1.93E+02	4.02E+03	4.70E+03	1.30E+03	1.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E+01	4.64E+01	3.42E+01	5.30E+02
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	5.24E-02	6.47E-03	2.41E+00	2.46E+00	4.32E-02	7.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-03	1.63E-03	1.48E-03	3.46E-02

Note - MND - Module not declared INA - Indicator not assessed.

6. LCA Results - Additional LCI Indicators

N/A

7. Calculation rules

Methodology and reproducibility

The process descriptions and quantities in this study are reproducible in accordance to the reference standards that have been used. The references of all sources, both primary and public sources and literature, have been documented in the LCA report. The 'polluter pays' and 'modularity' principles have been followed. The cut-off criteria of section 6.3.5 of EN 15804 have been followed. Allocation has been done on a mass basis. The measurement of environmental impacts uses the CML 2 baseline method. In addition, to facilitate the reproducibility of this LCA, a full set of data records has been generated which can be accessed via the EcoChain tool. This data portfolio contains a summary of all the data used in this LCA, and correspondingly, in the Kingscourt Brick Ecochain account.

Data quality

Data flows have been modeled as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources.

Data collection period

The dataset is representative for the production processes used in 2020.

8. Scenarios and additional technical information

A1. Raw materials supply

This module considers the extraction and processing of all raw materials and energy which occur upstream to the Kingscourt Brick manufacturing process, as well as waste processing up to the end-of waste state.

A2. Transport of raw materials to manufacturer

This includes the transport distance of the raw materials to the manufacturing facility via road and sea.

A3. Manufacturing

This module covers the manufacturing of Kingscourt bricks and includes all processes linked to production such as, mixing, drying, firing, packing and internal transportation. Use of electricity, natural gas, diesel and auxiliary materials used during production is taken into account as well.

A4 and A5. Transport and installation

This module covers road transport of the the bricks from production site in Kingscourt to construction site in Ireland.

A4: Transport to site references:

Road transport: Transport, freight, lorry 7.5-16 metric ton, EURO6 | Europe

Distance by road: 200 km

Capacity utilisation: 64%

A5: installation on site:

It is assumed there are 5% losses on site, from cutting and damage, and that all this material is sent to recycling by the contractor. The distance to the recycling facility is assumed to be 50km.

C2, C3, and C4. End of Life**C1:** Demolition/deconstruction:

No specific energy, nor materials, are allocated to this phase, and the impacts are assumed to be zero in C1.

C2: Transport:

Transport from the construction site to landfill is 50km.

C3: Processing:

It is assumed that bricks are crushed on site, by a mobile crushing plant. Of the crushed bricks it is assumed that 90% are re-used on the demolition/construction site as infill, and 10% are sent off-site to landfill.

The energy used to fuel the crushing plant on site is assumed to be diesel, and one tonne of bricks uses 0.83 litres of diesel for crushing.

C4: 10% of the bricks are disposed in an inert landfill site.

D4 (Benefits beyond the system)

Per tonne, 900kg of crushed brick is used on site as clean fill. This 900kg of crushed brick is assumed to take the place of 900kg of virgin raw aggregate.

9. Mandatory additional information on release of dangerous substances to indoor air, soil and water

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the limit for registration with the European Chemicals Agency.

10. Other optional additional environmental information

The electricity fuel mix used by Kingscourt Brick, and modelled in this LCA/EPD is 100% renewable.

11. References

1. ISO 14040: Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO 14040:2006.
2. ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO 14044:2006.
3. ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO 14025:2006.
4. I.S. EN 15804: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', I.S. EN 15804:2012+A1:2013.
5. Ecochain, 2020, web: <http://app.ecochain.com>.
6. CML - Department of Industrial Ecology, CML-IA Characterisation Factors, Dated August 2016, Leiden University, Leiden, Netherlands Available at: <https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors>
7. Ministerie van Verkeer en Waterstaat, 8 maart 2004, Toxiciteit heeft z'n prijs, Schaduwprijzen voor (eco-) toxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc.
8. Product Category Rules : Part A. Implementation and use of I.S. EN 15804:2012 and CEN TR 16970:2016 in Ireland. EPD Ireland, Irish Green Building Council, July 2018.