ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

CEDRAL slates

Etex

EPD HUB, HUB-2804

Publishing date 24 January 2025, last updated on 24 January 2025, valid until 23 January 2030.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Etex Ireland Ltd
Address	Kilkenny Rd, Bleach, Athy, Co. Kildare, R14 VN84, Ireland
Contact details	info@etexgroup.com
Website	https://www.cedral.world

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 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-B7, and modules C1-C4, D
EPD author	Peggy Van De Velde, PRTC N.V., Etex Group
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

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	CEDRAL slates
Place of production	Athy, Ireland
Period for data	Calendar year 2023
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m² of CEDRAL slates with a thickness of 4 mm
Declared unit mass	8.4 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	5.96
GWP-total, A1-A3 ($kgCO_2e$)	5.46
Secondary material, inputs (%)	1.06
Secondary material, outputs (%)-landfilling scenario	0.35
Secondary material, outputs (%)-recycling scenario	100
Total energy use, A1-A3 (kWh)	17.2
Net freshwater use, A1-A3 (m^3)	0.04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Etex Ireland Ltd is a leading supplier of quality products for architecturally sophisticated facades and roofs made of fibre cement.
Etex Ireland Ltd has an environment, health and safety management system which is ISO 14001 and ISO 45001 certified. The quality management system of the company and the production facility are certified according to ISO 9001. The responsible sourcing within the company is certified according to the BES6001 sustainability standard.
Etex Ireland Ltd is part of the global Etex Group of Companies, which operates across Europe, Africa, Near & Middle East and South America. The Etex group operates more than 160 sites in 45 countries and employs over 13 500 people worldwide.

PRODUCT DESCRIPTION

CEDRAL slates are naturally hardened fibre cement slates comprising cellulose and polymer fibers for water retention, improved tensile load distribution and increased breaking load and distortion.

This EPD is representative for all the Cedral slates produced by Etex Ireland Ltd and presents the environmental impacts for the production of 1 m² of CEDRAL slates with a thickness of 4 mm, a reference service life of 60 years and its related impacts over the cradle to grave life-cycle modules.

Further information can be found at https://www.cedral.world.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Minerals	94.8	Europe
Fossil materials	2.3	World
Bio-based materials	2.9	World

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.11
Biogenic carbon content in packaging, kg C	0.03

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m² of CEDRAL slates with a thickness of 4 mm
Mass per declared unit	8.4 kg
Functional unit	1 m² of CEDRAL slates with a thickness of 4 mm, a reference service life of 60 years and its related impacts over the cradle to grave life-cycle module
Reference service life	60 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	X	X	X	X	X	X	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 for the final product and other ancillary materials (such as the process water; other consumables used during production were neglectable). 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.

Transport for raw materials considers the distance from the manufacturing location of the raw material to the production plant and the modelling of the relevant transportation type (e.g. bulk sea fret, road lorry, train, ...) for each raw material. Over 65% of our raw materials are sourced from suppliers within a radius of 150 km from our factories.
Regarding the energy used, natural gas and electricity were consumed during manufacturing. The electricity used in the manufacturing plant is 100% sourced from renewable sources.

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.

For the transportation from the production plant to the building site, a scenario representative for the average transport in 2023 was used. This consisted in transport from the production plant in Ireland to construction sites across Ireland and mainland UK using a lorry and a sea ferry with respectively average transportation distances of 378 km and 53 km.

Installation (A5) of the product is according to the following scenario(s): fixation of the slates to the substructure. This EPD declares copper nails and rivets to fix the slates.

As fixing is mostly manual, it is assumed that no energy is consumed in the installation.

Note that this EPD declares 1 m² of slates representing a weight of 8.4 kg. When the slates are installed on a roof or a facade, depending on the selected application, pattern, slate format and inclination, a certain overlap of slates will be required.

To take into account the impacts of a certain overlap of slates one should multiply the results declared in this EPD with a specific correction factor. This correction factor can be calculated based on the weight of slates needed for covering 1 m² divided by the declared weight of 1 m² of slates in this EPD being 8.4 kg. The weight of slates needed for covering 1 m² in a specific application can be found in the Cedral fibre cement slates fixing guide. Taking as an example the roof application with slates 600 x 300 mm with a lap of 110mm. In this case the Cedral guide indicates that 20.9 kg slates are needed for covering 1 m² of roof surface. The correction factor equals in this specific case 20.9/8.4=2.49. When the results declared in this EPD are multiplied with the factor 2.49, this indicates the impact for 1 m² covered roof surface for the selected application.

During the installation, some losses may occur. For this study, an average loss rate of 1.5% is used (scenario considered for the losses: 100% landfill, truck transport 50 km). All packaging material for the slates is transported to EoL (scenario: truck transport to landfill 50 km/ to recycling 100 km) and waste treatment is included (assuming 100% recycling for the wooden pallet and the cardboard and 100% landfill for the small amounts of plastic packaging used).

PRODUCT USE AND MAINTENANCE (B1-B7)

The product has an estimated reference service life of 60 years, providing the product is installed as per Etex recommendations. In such case, the product will last during its life of use generally without any requirements for maintenance, repair, replacement, or refurbishment, providing normal and no accidental conditions of usage are encountered. The product will also not need any operational energy nor operational water to fulfil its duty, once installed in the building.

The only impact during the use phase is that of carbonation, where some CO2 is adsorbed from the atmosphere over the life time of the panel. Depending on the application where the panels are used, the degree of carbonation will vary. The carbonation was calculated for the outdoor use exposed to rain scenario and reported in the B1 module.

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

PRODUCT END OF LIFE (C1-C4, D)

Two possible end-of-life scenarios are considered for the slates:

Scenario 1: 100% landfilling scenario: 100% of slates from demolition wastes are going to landfill at end of life (C4).

Scenario 2: 100% recycling scenario: 100% of slates from demolition wastes are going to recycling at end of life (C3), where it was assumed that the slate waste is used to replace limestone in the cement production process.

In both scenarios, the copper nails and rivets used for installation are considered to be 100% recycled.

For the dismantling of the Cedral slates in C1, manual dismantling was considered.

The transport of the waste to the end-of-life (C2) is considered to be 50 km from the plant in the landfilling scenarios and 100 km from the plant in the recycling scenario.

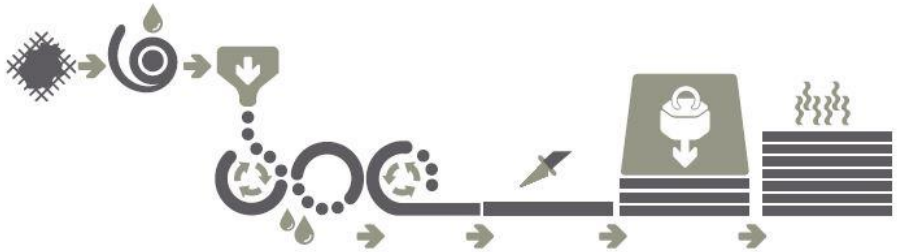
Outside the system boundaries, module D shows benefits and loads from the recycling processes. In scenario 1 these are related to the recycling of the packaging materials and the cupper nails and rivets. In scenario 2 these are related to the recycling of the fibre cement slates, the packaging materials and the nails/rivets.

MANUFACTURING PROCESS

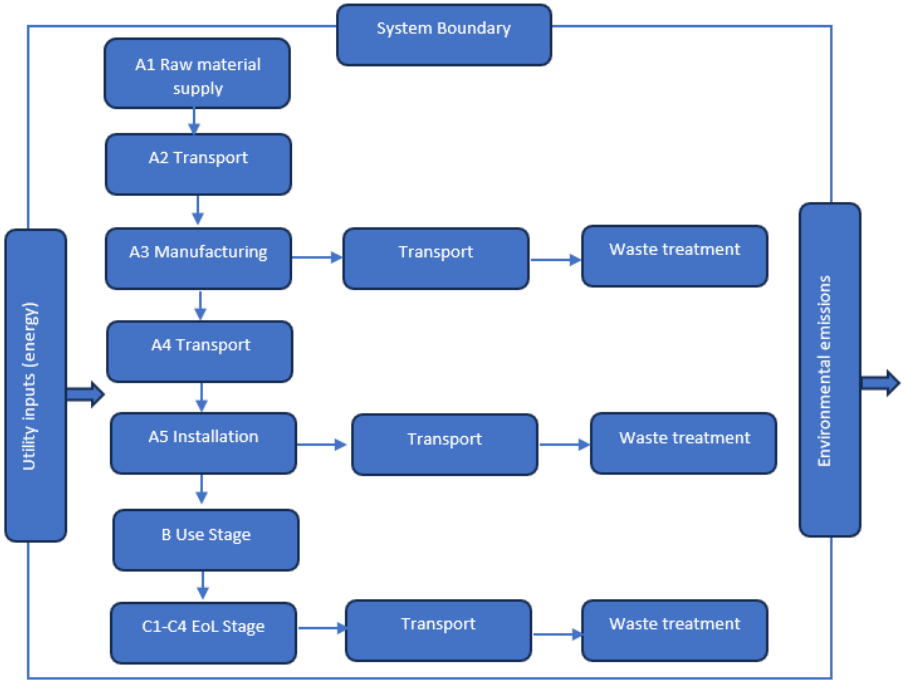
DESCRIPTION

The CEDRAL slates are naturally hardened fibre cement slates. The constituent raw materials of the slate comprise: cement, GGBS, limestone, admixtures, synthetic fibres, pigments, paint and water. Cedral fibre cement slates are manufactured in accordance with IS EN 492:2012+A2:2018, 'Fibre-cement slates and fittings. Product specification and test methods.

Cedral fibre cement slates are manufactured from a slurry of the above raw materials. The process is similar to the process used in papermaking, the Hatschek Process. Cellulose papers are mixed with water and refined to a consistency suitable for mixing with further materials. Ground limestone, synthetic fibres, and other minor constituents are then mixed with the cellulose slurry. This mix is then pumped into the final mixer, where additional water, cement and GGBS are added. The slurry is fed into vats containing rotating sieve cylinders that deposit a thin layer on to a felt. The layer is then transferred to a forming drum until a sheet of the desired thickness is achieved. This sheet is trimmed and cut into the required slate sizes. These are then placed between forming templates and compressed. The compressed slates are cured in a heated chamber and then at ambient indoor conditions. Then they are coated with pigmented paints. Finally, the slates are palletised, and are ready for despatch to the market.



See below the included life cycle stages within the system boundary of this study:



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.

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	No allocation
Manufacturing energy and waste	No allocation

AVERAGES AND VARIABILITY

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

This EPD is product and factory specific and does not contain average calculations.

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 v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

Two end- of- life scenarios have been calculated: “100% landfill” (referred in the tables as modules C2/1, C3/1, C4/1 and D/1) and “100% recycling” (referred in the tables as modules C2/2; C3/2; C4/2 and D/2).

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
GWP – total[1)]	kg CO_2e	5,46E+00	5,97E-01	3,83E-01	-2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,03E-02	1,45E-01	1,38E-03	4,21E-01	4,46E-01	0,00E+00	-1,52E-01	-4,95E-01
GWP – fossil	kg CO_2e	5,96E+00	5,96E-01	2,77E-01	-2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,03E-02	1,45E-01	1,38E-03	1,88E-02	4,45E-02	0,00E+00	-2,71E-02	-4,45E-02
GWP – biogenic	kg CO_2e	-5,08E-01	0,00E+00	1,06E-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	0,00E+00	0,00E+00	0,00E+00	4,02E-01	4,02E-01	0,00E+00	-1,25E-01	-4,51E-01
GWP – LULUC	kg CO_2e	2,03E-03	2,62E-04	1,62E-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	2,84E-05	6,11E-05	0,00E+00	3,48E-05	4,20E-05	0,00E+00	1,40E-04	1,35E-04
Ozone depletion pot.	kg CFC-$_{11}$e	2,77E-07	1,28E-07	1,30E-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	1,63E-08	3,13E-08	4,18E-13	1,28E-09	1,80E-08	0,00E+00	9,93E-10	-2,20E-09
Acidification potential	mol H^+e	1,58E-02	3,23E-03	4,85E-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	2,00E-04	4,27E-04	3,53E-06	1,14E-04	4,18E-04	0,00E+00	-7,80E-04	-1,22E-03
EP-freshwater[2)]	kg Pe	2,20E-04	4,81E-06	2,17E-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	5,06E-07	1,23E-06	1,15E-08	1,59E-06	4,66E-07	0,00E+00	3,49E-08	-8,99E-08
EP-marine	kg Ne	1,86E-03	7,26E-04	4,18E-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	3,98E-05	8,52E-05	9,69E-07	2,35E-05	1,45E-04	0,00E+00	-1,13E-04	-2,69E-04
EP-terrestrial	mol Ne	5,11E-02	8,07E-03	5,61E-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	4,42E-04	9,47E-04	1,13E-05	2,63E-04	1,59E-03	0,00E+00	-1,23E-03	-3,42E-03
POCP (“smog”)[3)]	kg NMVOCe	1,38E-02	2,50E-03	1,57E-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	1,70E-04	3,55E-04	2,82E-06	7,26E-05	4,63E-04	0,00E+00	-3,45E-04	-8,05E-04
ADP-minerals & metals4)	kg Sbe	8,93E-06	2,00E-06	1,32E-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	2,58E-07	5,18E-07	1,63E-10	1,32E-07	1,02E-07	0,00E+00	-3,80E-05	-3,80E-05
ADP-fossil resources	MJ	4,48E+01	8,55E+00	3,27E+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	1,05E+00	2,10E+00	1,97E-02	3,69E-01	1,22E+00	0,00E+00	9,73E-02	-1,20E-01
Water use[5)]	m^3e depr.	1,33E+00	3,68E-02	7,57E-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	4,93E-03	9,34E-03	3,73E-06	8,69E-03	3,87E-03	0,00E+00	1,72E-02	7,63E-03

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, PEF

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Particulate matter	Incidence	6,66E-08	4,51E-08	1,38E-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	5,63E-09	1,15E-08	2,54E-11	9,96E-10	8,42E-09	0,00E+00	-3,63E-09	-1,02E-08
Ionizing radiation[6]	kBq U235e	5,60E-02	4,00E-02	1,61E-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	5,50E-03	9,87E-03	2,24E-06	8,64E-03	5,51E-03	0,00E+00	4,42E-03	3,45E-03
Ecotoxicity (freshwater)	CTUe	2,05E+01	7,66E+00	3,53E+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	8,75E-01	1,93E+00	1,04E-03	2,40E-01	7,95E-01	0,00E+00	2,44E-01	-1,85E+01
Human toxicity, cancer	CTUh	1,75E-09	2,32E-10	7,32E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,71E-11	5,46E-11	1,35E-13	1,28E-11	1,99E-11	0,00E+00	1,05E-11	3,14E-12
Human tox. non-cancer	CTUh	1,18E-08	6,84E-09	5,46E-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	8,55E-10	1,75E-09	1,48E-11	2,79E-10	5,20E-10	0,00E+00	-1,02E-09	-1,22E-09
SQP[7]	-	6,88E+01	5,64E+00	2,63E+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	7,38E-01	1,47E+00	6,34E-03	1,92E-01	2,61E+00	0,00E+00	1,19E+00	1,06E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Renew. PER as energy[8]	MJ	1,46E+01	9,82E-02	5,42E-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	1,54E-02	2,52E-02	5,40E-04	6,33E-02	1,06E-02	0,00E+00	-4,42E-01	-4,48E-01
Renew. PER as material	MJ	4,21E+00	0,00E+00	-9,24E-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	0,00E+00	0,00E+00	0,00E+00	-3,28E+00	-3,28E+00	0,00E+00	7,61E-01	-2,49E+00
Total use of renew. PER	MJ	1,88E+01	9,82E-02	-3,81E-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	1,54E-02	2,52E-02	5,40E-04	-3,22E+00	-3,27E+00	0,00E+00	3,20E-01	-2,94E+00
Non-re. PER as energy	MJ	4,25E+01	8,56E+00	3,23E+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	1,05E+00	2,10E+00	1,98E-02	3,68E-01	1,22E+00	0,00E+00	9,32E-02	-1,24E-01
Non-re. PER as material	MJ	2,45E+00	0,00E+00	-2,62E-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	0,00E+00	0,00E+00	0,00E+00	-2,19E+00	-2,19E+00	0,00E+00	5,55E-02	5,55E-02
Total use of non-re. PER	MJ	4,49E+01	8,56E+00	2,97E+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	1,05E+00	2,10E+00	1,98E-02	-1,82E+00	-9,70E-01	0,00E+00	1,49E-01	-6,88E-02
Secondary materials	kg	1,04E-01	2,91E-03	6,49E-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	3,60E-04	7,07E-04	3,89E-02	3,90E-02	2,56E-04	0,00E+00	4,73E-02	4,72E-02
Renew. secondary fuels	MJ	2,23E+00	3,50E-05	3,35E-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	3,97E-06	9,15E-06	7,64E-08	3,87E-07	6,69E-06	0,00E+00	1,73E-05	1,26E-05
Non-ren. secondary fuels	MJ	2,46E+00	0,00E+00	3,68E-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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	4,03E-02	9,82E-04	2,41E-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	1,34E-04	2,52E-04	8,70E-08	2,72E-04	1,33E-03	0,00E+00	4,36E-04	2,13E-04

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Hazardous waste	kg	4,91E-02	1,23E-02	3,71E-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	1,20E-03	3,05E-03	3,91E-05	1,29E-03	0,00E+00	0,00E+00	-2,87E-02	-2,93E-02
Non-hazardous waste	kg	7,26E-01	1,90E-01	1,30E+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	2,13E-02	4,87E-02	5,11E-06	7,20E-02	8,44E+00	0,00E+00	3,86E-02	3,39E-02
Radioactive waste	kg	4,97E-05	5,72E-05	1,05E-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	7,19E-06	1,40E-05	1,25E-07	2,64E-06	0,00E+00	0,00E+00	-2,09E-05	-2,23E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
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	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
Materials for recycling	kg	7,52E-01	0,00E+00	7,76E-02	7,52E-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	0,00E+00	2,97E-02	8,47E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	7,24E-04	0,00E+00	1,09E-05	7,24E-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	0,00E+00	0,00E+00	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	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

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Global Warming Pot.	kg CO_2e	5,46E+00	5,91E-01	2,67E-01	-2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,97E-02	1,44E-01	1,36E-03	1,86E-02	4,36E-02	0,00E+00	-2,56E-02	-4,26E-02
Ozone depletion Pot.	kg CFC_{-11}e	2,79E-07	1,01E-07	1,14E-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	1,29E-08	2,48E-08	6,80E-13	1,07E-09	1,42E-08	0,00E+00	9,24E-10	-1,61E-09
Acidification	kg SO_2e	8,84E-03	2,62E-03	4,33E-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	1,64E-04	3,50E-04	2,69E-06	9,27E-05	3,16E-04	0,00E+00	-7,29E-04	-1,02E-03
Eutrophication	kg PO_4^3e	2,23E-03	4,37E-04	1,22E-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	3,55E-05	7,73E-05	4,08E-07	5,99E-05	6,81E-05	0,00E+00	-1,53E-05	-8,59E-05
POCP (“smog”)	kg C_2H_4e	6,34E-04	9,84E-05	1,57E-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	8,29E-06	1,74E-05	1,43E-07	3,62E-06	1,32E-05	0,00E+00	-2,41E-05	-2,85E-05
ADP-elements	kg Sbe	8,77E-05	1,95E-06	1,33E-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	2,52E-07	5,06E-07	1,63E-10	1,31E-07	1,01E-07	0,00E+00	-3,80E-05	-3,81E-05
ADP-fossil	MJ	3,69E+01	8,55E+00	2,98E+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	1,05E+00	2,10E+00	1,96E-02	3,68E-01	1,22E+00	0,00E+00	1,46E-01	-7,18E-02

ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
ADP-elements	kg Sbe	5,44E-06	1,95E-06	1,32E-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	2,52E-07	5,06E-07	1,63E-10	1,31E-07	1,01E-07	0,00E+00	-3,80E-05	-3,81E-05
Hazardous waste disposed	kg	4,89E-02	1,23E-02	3,71E-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	1,20E-03	3,05E-03	3,91E-05	1,29E-03	0,00E+00	0,00E+00	-2,87E-02	-2,93E-02
Non-haz. waste disposed	kg	6,55E-01	1,90E-01	1,30E+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	2,13E-02	4,87E-02	5,11E-06	7,20E-02	8,44E+00	0,00E+00	3,86E-02	3,39E-02
Air pollution	m^3	1,73E+02	9,00E+01	2,74E+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	8,96E+00	2,14E+01	2,68E-01	5,12E+00	9,78E+00	0,00E+00	7,54E+01	1,67E+01
Water pollution	m^3	3,08E+00	6,67E-01	2,18E+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	9,74E-02	1,69E-01	1,90E-03	2,94E-01	6,47E-02	0,00E+00	1,59E+00	1,57E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
GWP-GHG[9)]	kg CO_2e	5,97E+00	5,97E-01	2,77E-01	-2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,03E-02	1,45E-01	1,38E-03	1,88E-02	4,45E-02	0,00E+00	-2,71E-02	-4,45E-02

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.

ENVIRONMENTAL IMPACTS – BEPALINGSMETHODE, NETHERLANDS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2/1	C2/2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
Shadow price	€	1,47E-01	7,85E-02	2,27E-01	-1,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,23E-03	1,73E-02	8,84E-05	3,45E-03	7,32E-03	0,00E+00	-4,60E-03	-8,73E-03
Terrestrial ecotoxicity	DCB eq	4,40E-03	1,62E-03	8,01E-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	2,01E-04	4,01E-04	1,26E-06	1,41E-04	1,21E-04	0,00E+00	1,45E-04	1,14E-04
Seawater ecotoxicity	DCB eq	1,72E+02	8,98E+01	1,28E+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	9,30E+00	2,19E+01	1,68E-02	8,82E+00	7,66E+00	0,00E+00	-4,11E+00	-6,98E+00
Freshwater ecotoxicity	DCB eq	2,31E-02	8,84E-03	1,29E-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	1,09E-03	2,19E-03	2,26E-06	1,62E-04	7,59E-04	0,00E+00	-1,12E-04	-2,80E-04
Human ecotoxicity	DCB eq	5,90E-01	2,71E-01	1,94E+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	3,00E-02	6,20E-02	2,33E-05	7,47E-03	2,61E-02	0,00E+00	2,03E-03	-1,10E-02
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	0,00E+00
ETE	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	0,00E+00
ADP Fossil Fuels	kg Sbe	1,47E-01	7,85E-02	2,27E-01	-1,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,03E-04	1,01E-03	9,42E-06	1,77E-04	5,86E-04	0,00E+00	7,01E-05	-3,45E-05

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

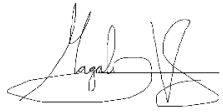
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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
24.01.2025



VERIFIED ISO 14025