Environmental Product Declaration

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

Yellow clay products

from

LODE SIA

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11028
Publication date:	2023-10-12
Valid until:	2028-10-11

This EPD covers multiple products and is considered as a FAMILY EPD based on an average recipe

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *Construction Products, PCR 2019:14 Version 1.3.1*
PCR review was conducted by: *The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members.* *The review panel may be contacted via the Secretariat info@environdec.com*
Life Cycle Assessment (LCA)
LCA accountability: *Bureau Veritas Latvia SIA. Email: riga@bureauveritas.com*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: *Elisabet Amat, GREENIZE* Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for 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.

Company information

Owner of the EPD: LODE SIA

Contact: Marita Bērziņa, Quality Manager, marita.berzina@lode.lv, +371 29153102

Description of the organisation: LODE is the leading manufacturer of ceramic building materials in the Baltics. LODE has two factories equipped with modern equipment and is using modern technologies to ensure the production of high-quality ceramic building materials, including facing bricks, finishing elements, pavers, and construction blocks under the brand name KERATERM. The newest of the factories is located in Jelgava municipality, where KERATERM construction blocks are produced. Second LODE factory, located in Cēsis municipality, is the oldest among two factories, operating since 1958. Initially, the factory was built to produce drainage pipes, which were manufactured from 1963 to 1980. However, in 1968, the production of clay bricks has been launched and it continues to this day. LODE sells its products in Latvia and exports them to Lithuania, Estonia, Poland, Scandinavia, and other countries.

Product-related or management system-related certifications: (EU) Directive No.305/2011 applies for placing the product on the market in the EU/EFTA. The products require a Declaration of Performance taking consideration of the standards LVS EN 771-1+A1:2015 for facing bricks, LVS EN 1344:2014/AC:2015 for clay pavers, and CE-marking.

Name and location of production site(s): Liepa, Cēsis municipality, where ceramic bricks and pavers considered in this study and respective EPDs are produced

Āne, Jelgava municipality where KERATERM construction blocks are produced.

Product information

Product name:

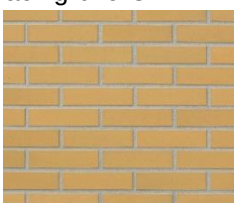
Yellow ceramic facing bricks and pavers.

Product identification:

Perforated, solid bricks and pavers based on Yellow firing clay with such additives as Barium carbonate and Hydrophobizer for enhancement of colour. To achieve the different product colours, Engobes are applied and different firing techniques are used.

Product illustrations:

Facing bricks:



Sahara

Blanka

Wenus

Pavers:

Sahara

Sonora

Product description:
This EPD covers perforated, solid bricks and pavers based on light (yellow) firing clay with additives such as Barium carbonate for colour change or enhancement produced at LODE SIA. Hydrophobizer is used for special Engobe to protect product during transportation. To achieve the different product colours, Engobe is applied and different firing techniques are used.
Application of bricks – facades, chimneys, furnaces, fences, load-bearing and non-load-bearing walls, columns, bridge supports etc. Application of pavers – paths and squares without intense traffic.

The technical parameters of the **facing bricks** perforated and solid considered as a declared unit are:

Name	Value	Unit
Freeze/Thaw resistance	≥ 50 – 100	cycles
Gross density	1440 – 2150	kg/m³
Compressive strength	35 – 50	N/mm²
Water absorption	6 – 12	%
Active soluble salts	S2	

The technical parameters of the **Pavers**

Name	Value	Unit
Freeze/Thaw resistance	FP100	
Gross density	2150	kg/m³
Transverse breaking load	≥ 30 - 80	N/mm
Abrasion resistance	≤ 450	mm³
Slip and skid resistance	≥ 55	(PTV units)
Acid resistance	≤ 7	% (mass loss)

UN CPC code: 3731 - Bricks, blocks, tiles and other ceramic goods of siliceous earths
Additional codes: GTIN 475101027, NACE Code 2332 - Manufacture of fired clay building materials
Geographical scope: This EPD has a European Scope, as installation activities and primary raw materials are independent of the region where the products will be installed. Nonetheless, it must be clarified that transport distances to construction sites (module A4) in the model under study correspond to several construction sites in different parts of Europe.

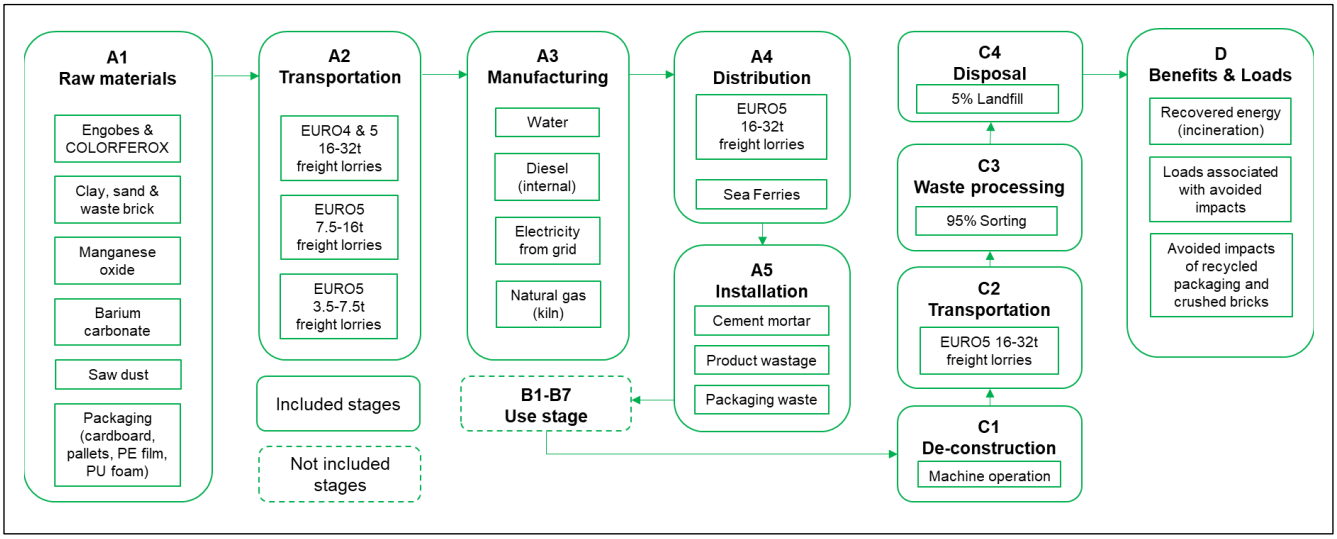
LCA information

Functional unit / declared unit: 1000kg of Yellow clay products
Reference service life: It has been assumed that reference service life is equal to estimated Service Life of building or the structure of intended use. Since this is not a cradle-to-grave EPD, RSL not mandatory to be reported. According to ISO 15686-1:2011, RSL would be 150 years.
Time representativeness: Data represents the manufacturing of the products in year 2021. The database used for proxy data is Ecoinvent v3.8. This database data is compiled in November 2021, i.e., no data is older than ten years.
Database(s) and LCA software used: Ecoinvent v3.8 has been used to conduct the quantitative evaluation in this study. This database provided the background system's life cycle inventory data for raw and processed materials. The LCA software used to obtain results of impact assessment - SimaPro 9.4.

Description of system boundaries: LCA study has been performed in the “Cradle-to-gate with options, modules C1 – C4 and module D” form. All major materials, production energy use, and waste are included for phases A1-A3, A4-A5, C1-C4 and D. Use stage (B1-B7) has not been considered for this study as it is not mandatory.

The processes related to infrastructure, construction, and production of equipment, as well as tools that are not directly consumed in the production process, have been excluded. Personnel-related activities, such as transportation to and from work, have been excluded.

System diagram:



Data quality: The foreground data has been collected internally, considering the latest available average production amounts and measurements during the 2021. Data regarding waste processing has been taken from waste scenarios for closest locations in Ecoinvent v3.8. The quality level in this study is qualified as very good according to the UN Environment Global Guidance criteria on LCA database development. Data is geographically representative as it comes from the area of study. It is technically representative as it comes from processes and products under study using the same state of technology defined in goal and scope. According to the provided data, it is also time representative. Data quality rating procedure has been performed using a rating system where “1” means Excellent quality, and “5” means Poor quality. An average for each criterion is presented as follows:

Technological Representativeness, TeR	Geographic representativeness, GeR	Time Representativeness, TiR	Precision, P	**Average DQR**
2,17	2,19	2,00	2,71	**2,17**

Stages and Production description

Product Stage

Module A1 includes Raw material supply, i.e. production of raw materials and packaging for the final product. In module A1, extraction and processing of raw materials and generation of electricity and heat from primary energy resources to produce these raw materials are included. Raw materials for Yellow clay products are: Light clay, quartz sand, hydrophobizer, Barium carbonate, different types of Engobes (clay powder with different additives) and recycled fired brick. Materials used for packaging are polyethylene (PE) packaging film, cardboard, wooden pallets and 2mm thick PE foam.

In **Module A2**, transport type and distances from the locations of raw material suppliers to the LODE manufacturing plant in Latvia are included according to the data provided by manufacturer. Materials, distances and means of transportation are listed in the Table below:

Material	Type of vehicle	kgkm	Distance, km	Fuel consumption, l/tkm	Value, l/t
Cardboard	Lorry 7.5-16t, EURO5	23,03	109	0,0556	6,07
PE packaging film	Lorry 16-32t, EURO5	917,79	2211	0,0441	97,46
Pallets	Lorry 16-32t, EURO5	1124,27	127	0,0441	5,60
Engobes	Lorry 7.5-16t, EURO5	675,62	1628	0,0556	90,60
PE foam	Lorry 16-32t, EURO5	3,04	67	0,0441	2,95
Sand	Lorry 16-32t, EURO5	91,45	107	0,0441	4,72
Barium	Lorry 16-32t, EURO5	10792,61	1945	0,0441	85,74
Hydrophobizer	Lorry 3.5-7.5t, EURO5	6,37	100	0,1286	12,86
Light clay	Lorry 16-32t, EURO5	1171531,41	1271	0,0441	56,03
Clay	Lorry 16-32t, EURO4	300,91	1	0,0441	0,04

Module A3 represents manufacturing stage of the product. Clay products are composed mainly of different types of clay, sand and additives for the purpose of color and maintaining technical parameters during the reference service life of a product. Manufacturing of clay product includes temporary storage of raw materials, preparation of raw materials, forming by extrusion, drying, firing, sorting and packaging. For the purpose of heat generation for drying and firing manufacturer uses Natural gas.
Besides brick manufacturing, this stage also declares waste flows of raw materials for reuse and quarry recultivation purposes. Manufacturing waste for recultivation purposes has been considered as Final waste flow for the sake of mass balance. Waste treatment of packaging materials from incoming raw materials and emissions to air are also included. The waste scenario follows the data present in Ecoinvent v3.8 and considers information collected during manufacturing plant visit. Dataset includes processes associated with collection of waste and national (Latvia) scenario of waste treatment.

Greenhouse gas emissions from the use of Electricity in the manufacturing phase are represented by the National production mix that consists of import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3). No additional data has been provided on consumed electricity, therefore, emission factor acquired from Ecoinvent v3.8, representing GWP-GHG of Latvian electricity mix is 0.532 kgCO2eq/kWh.

Construction process Stage

Table below describes the scenarios for **module A4** transportation of the final product and its packaging from LODE manufacturing plant in Latvia to Construction sites. The distances to customers have been provided by manufacturer:

Country	Vehicle	kg*km	Distance, km	Fuel consumption, l/tkm	Value, l/t
Estonia	Lorry 16-32t, EURO5	1599,09	264	0,0441	11,64
Latvia	Lorry 16-32t, EURO5	31673,82	125	0,0441	5,51
Lithuania	Lorry 16-32t, EURO5	15264,01	280	0,0441	12,34
Poland	Lorry 16-32t, EURO5	500804,77	720	0,0441	31,74

Installation module A5 has also been considered in this study. According to Almeida et al, (2014) brick wall construction has been considered using the manufacturer's provided data on square meters of each type of clay product and required amount of mortar. It has been assumed that walls are constructed manually with the use of cement mortar seals. Considering provision of product (bricks and blocks) wastage described in Sub-PCR, 3% wastage of the product has been included in Installation module along with additional production and transportation processes to compensate for the loss of wastage of product. Packaging waste and environmental aspects linked to the transportation to waste processing and disposal facilities have also been considered in module A5.

Use Stage:

Modules B1-B7, that define use stage of the product, are not declared for this study – those are not mandatory for LCA "Cradle-to-gate with options" form.

End of Life Stage:

Module C1 assumes demolition process and associated fuel consumption for machine operation described by Ivanica et al. Case study includes specific operation time for heavy building machinery per 1 m^2 of building's envelope that later is easily converted to Fuel consumption via Ecoinvent datasets.

Module C2 considers an average transport distance of 50 km by 16-32 metric ton EURO5 freight lorry.

After the deconstruction/demolition stage (C1), bricks are usually crushed (recycling process) towards secondary materials for another application (e.g., roadwork, concrete aggregates, etc.) replacing raw materials of similar application. **Module C3** accounts for the process of sorting of waste bricks.

Waste disposal **(module C4)** includes physical pre-treatment and management of the disposal site. Emissions from waste disposal are considered a part of the product system under study and, therefore, part of this module. 95% share of clay product waste is assumed to be reused, therefore, avoiding the use of similar infill raw materials used in roadwork, concrete etc. Only 5% of declared clay product waste material weight has been accounted for in waste disposal module C4 as landfilled inert waste.

Benefits and loads beyond the system boundaries:

This study is also considered the **D phase** (reuse, recovery, recycling, potential) where recycling and reuse of packaging material and avoided infill material for construction have been declared:

- 41.0% of PE packaging film and PE foam considered as avoided impact via recycling of packaging waste;

- 99% of Cardboard has been considered for Incineration in module C3, therefore, along with remaining part of Plastic waste, recovered energy, both Electrical and Heat, has been also considered as avoided impact;
- crushed gravel has been considered as avoided infill material via reuse of crushed clay product, i.e., excluding landfilled share of 5% (module C4);
- sawn softwood board has been considered as avoided impact via reuse/recycle of wooden pallets, i.e., packaging waste;
- Diesel, burned in a building machine, that is required for brick crushing, has been considered as load for avoided impact of crushed bricks.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	EU	EU	LV	EU	EU	MND	MND	MND	MND	MND	MND	MND	EU	EU	EU	EU	EU
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	NOT RELEVANT			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	NOT RELEVANT			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Clay	993,13	0%	0%
Barium carbonate	5,54	0%	0%
Hydrophobizer	0,06	0%	0%
Quartz Sand	0,85	0%	0%
Engobe	0,41	0%	0%
TOTAL	**1000,00**	0%	**0%**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
PE packaging film	0,42	0,042%	
Cardboard	0,21	0,021%	0,011
Wooden pallets	8,85	0,885%	0,464
PU foam	0,05	0,005%	
TOTAL	**9,53**	**0,953%**	**0,475**

No dangerous substances from the candidate list of SVHC for Authorization have been identified.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	3,8E+02	7,6E+01	4,5E+01	6,2E+00	6,9E+00	1,6E+00	2,5E-01	-1,0E+01
GWP-biogenic	kg CO_2 eq.	3,9E-01	-3,1E-02	1,9E-02	-2,1E-03	-2,8E-03	-3,7E-02	-4,2E-04	-8,1E+00
GWP-luluc	kg CO_2 eq.	7,0E-02	6,1E-04	2,1E-02	1,5E-04	5,6E-05	3,2E-03	9,6E-04	-2,1E-02
GWP-total	kg CO_2 eq.	3,8E+02	7,6E+01	4,5E+01	6,2E+00	6,9E+00	1,6E+00	2,5E-01	-1,8E+01
ODP	kg CFC 11 eq.	7,2E-05	1,8E-05	4,1E-06	1,4E-06	1,6E-06	1,4E-07	5,0E-08	-1,3E-06
AP	mol H^+ eq.	1,1E+00	2,6E-01	1,3E-01	2,7E-02	2,4E-02	1,1E-02	2,0E-03	-5,4E-02
EP-freshwater	kg P eq.	1,4E-03	3,9E-05	3,9E-04	4,3E-06	3,5E-06	1,4E-04	1,3E-06	-5,5E-04
EP-marine	kg N eq.	3,0E-01	8,4E-02	3,8E-02	1,0E-02	7,7E-03	2,4E-03	8,6E-04	-1,1E-02
EP-terrestrial	mol N eq.	3,3E+00	9,3E-01	4,2E-01	1,1E-01	8,5E-02	2,7E-02	9,4E-03	-1,2E-01
POCP	kg NMVOC eq.	9,7E-01	2,5E-01	1,1E-01	3,2E-02	2,3E-02	7,4E-03	2,6E-03	-3,7E-02
ADP-minerals&metals*	kg Sb eq.	7,5E-05	3,3E-06	4,9E-05	3,1E-07	3,0E-07	8,9E-08	1,7E-08	-1,9E-06
ADP-fossil*	MJ	5,9E+03	1,1E+03	3,6E+02	8,4E+01	9,8E+01	3,3E+01	3,3E+00	-1,7E+02
WDP*	m^3	2,1E+01	-1,8E-01	6,5E+00	2,2E-02	-1,6E-02	3,1E-01	2,0E-03	-1,4E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								

** 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.*

Potential environmental impact – additional mandatory and voluntary indicators

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	3,8E+02	7,5E+01	4,4E+01	6,1E+00	6,9E+00	1,6E+00	2,4E-01	-1,0E+01
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017									

Use of resources

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,1E+02	1,2E+00	9,2E+00	1,0E-01	1,1E-01	5,1E+00	9,2E-03	-9,5E+00
PERM	MJ	2,5E+02	4,1E-01	9,3E+00	3,5E-02	3,7E-02	7,2E-01	1,5E-02	-2,2E+02
PERT	MJ	3,6E+02	1,6E+00	1,9E+01	1,4E-01	1,5E-01	5,8E+00	2,4E-02	-2,3E+02
PENRE	MJ	5,9E+03	1,1E+03	3,6E+02	8,4E+01	9,8E+01	3,3E+01	3,3E+00	-1,7E+02
PENRM	MJ	4,0E-02	4,5E-04	6,5E-02	4,8E-04	4,1E-05	8,7E-05	6,6E-03	-1,5E-02
PENRT	MJ	5,9E+03	1,1E+03	3,6E+02	8,4E+01	9,8E+01	3,3E+01	3,4E+00	-1,7E+02
SM	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
RSF	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
NRSF	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
FW	m^3	6,7E-01	2,8E-03	1,6E-01	1,4E-03	2,5E-04	2,4E-02	1,1E-04	-3,6E-01
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Waste production and output flows

Waste production

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,0E-02	2,8E-03	5,2E-04	2,2E-04	2,6E-04	1,9E-05	8,8E-06	-2,0E-04
Non-hazardous waste disposed	kg	4,3E+01	4,4E-02	3,1E+00	5,2E-03	4,0E-03	4,1E-02	5,0E+01	-2,8E-01
Radioactive waste disposed	kg	2,2E-02	7,7E-03	1,6E-03	6,0E-04	7,0E-04	2,4E-04	2,3E-05	-9,0E-04

Output flows

Results per functional or declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Material for recycling	kg	0,0E+00	0,0E+00	3,8E+01	0,0E+00	0,0E+00	9,5E+02	0,0E+00	0,0E+00
Materials for energy recovery	kg	0,0E+00	0,0E+00	3,5E-01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Exported energy, electricity	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	1,4E+00
Exported energy, thermal	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	2,7E+00

Other environmental performance indicators

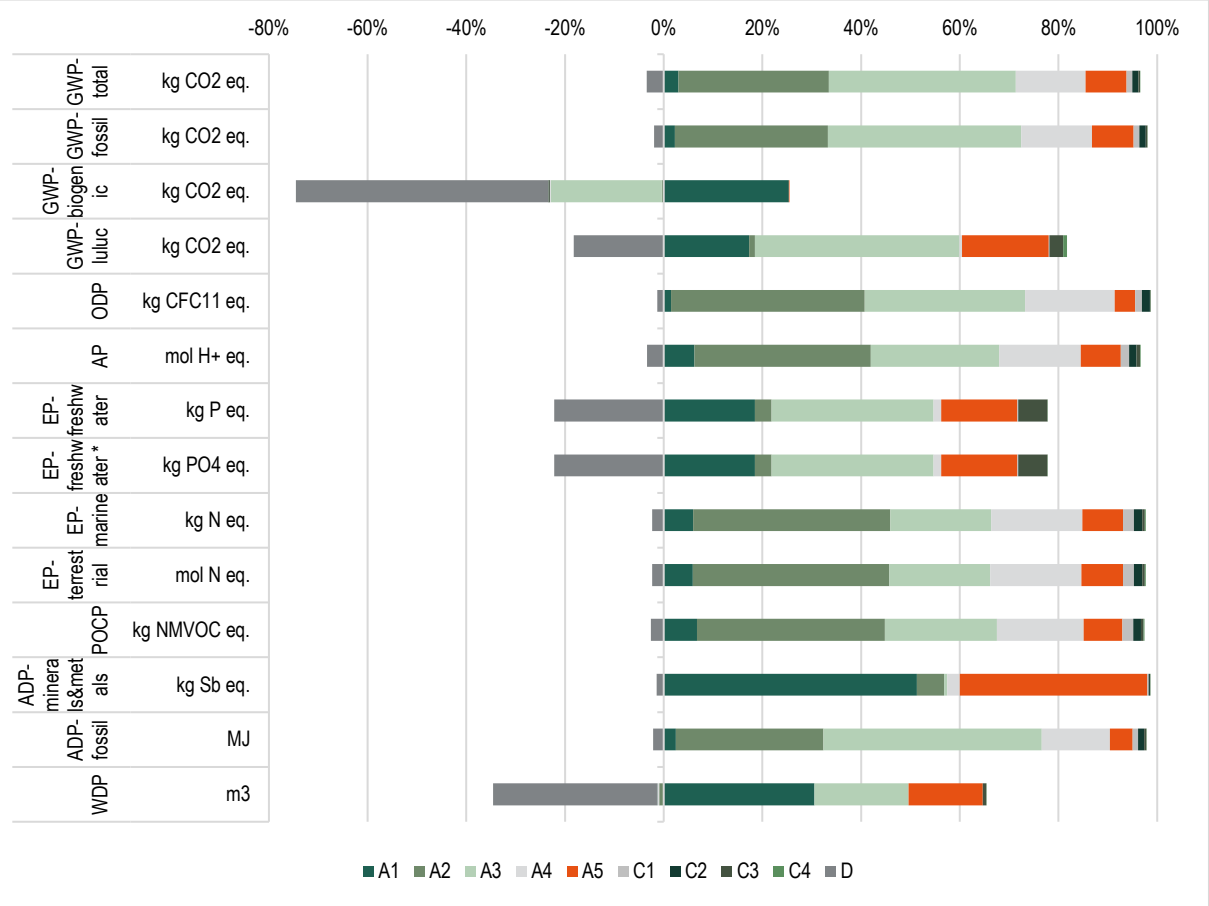
Biogenic carbon content

Results per functional or declared unit	
Biogenic carbon content	**Quantity**
Carbon content in product, kg C	0,00
Carbon content in accompanying packaging, kg C	4,53

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO_2

LCA Interpretation

The estimated impact assessment results are only relative statements that do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins, or risks.
Contribution to environmental impact per each module for declared unit of Yellow brick is displayed in following Figure:

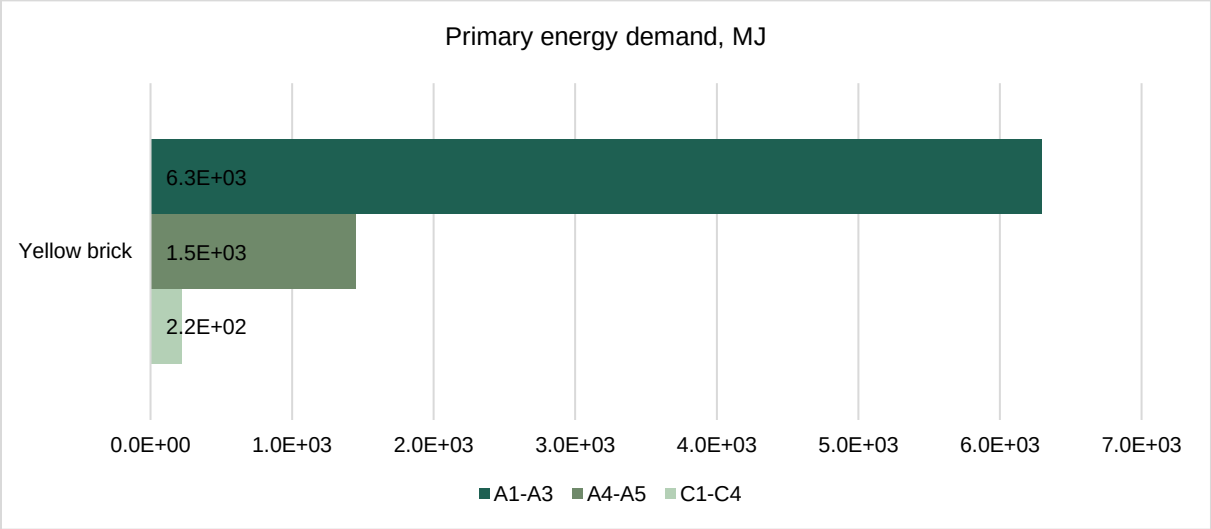


Contribution to environmental impact per each module for DU of Yellow brick

For Yellow bricks, module A2, representing transportation of raw materials to manufacturing plant, results in 30-40% of total impact in half of impact categories. The reason for that is one main raw material - Light burning clay. In comparison with two other types of bricks (Red and Brown), it is supplied not from own local clay pit, but from abroad, using Freight lorries over significant distances and, therefore, resulting in high environmental impact due to Tyre & Brake emissions, Diesel consumption etc. Manufacturing is still one of major contributors to the total impact of each mandatory impact category, along with distribution module A4, with former represented mainly by the use of Electricity from the grid and fossil fuels (Natural gas, Diesel), and the latter – by Road transportation over long distances, therefore, significant use of Diesel. 39% of total impact in Global warming potential of Yellow brick is resulting in manufacturing module A3, while distribution module A4 and installation module A5 are contributing 15% and 9% respectively. Supply of raw material in this case is responsible for 32% of GWP-total.

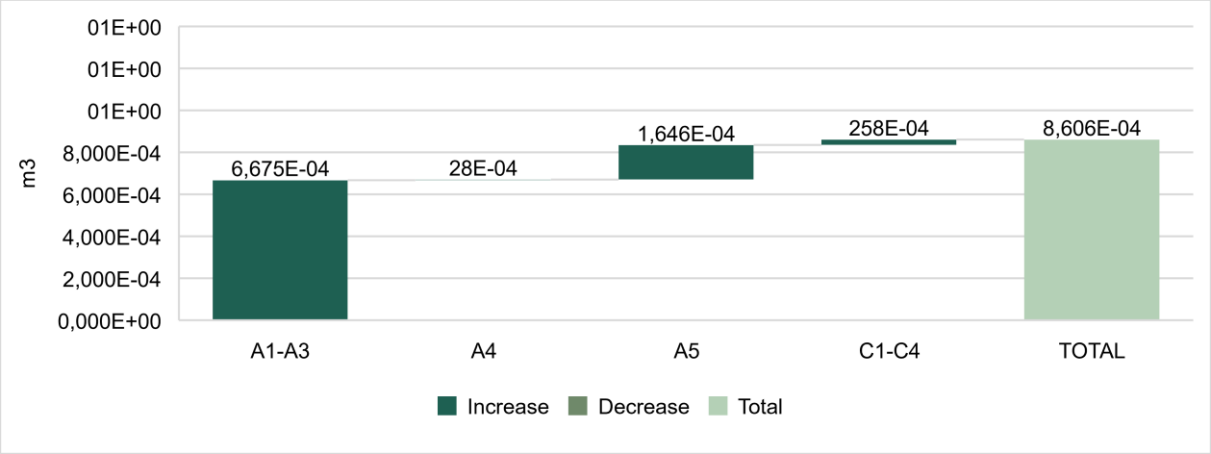
Considering total demand of primary energy per each declared unit, that has been calculated using Cumulative Energy Demand (LHV) V1.00 impact assessment method, demand of primary energy (displayed in following Figure) is distributed as follows:

- 79% for Product stage (A1-A3)
- 18% for Construction process stage (A4-A5)
- 3% for End-of-life stage (C1-C4)



Primary energy demand per DU of Yellow brick, aggregated

Other key effect factor is Freshwater consumption, that is displayed in following Figure as a Waterfall chart. A waterfall chart shows a running total as values are added or subtracted. It's useful for understanding how an initial value of net Freshwater use is affected by a series of positive and negative values. In case of Yellow brick no values has been subtracted as each module only adds up to total use. In terms of freshwater use levels, the Product stage (A1-A3) is responsible for most of its demand with 78% share, with 19% resulting in Installation module A5.



Net freshwater use for Yellow brick, aggregated

Additional environmental information

- Products must be used for the intended purposes, in compliance with the applicable standards and building codes (and/or other norms and regulations) that apply to the specific product and/or region.
- Products do not require additional maintenance with special means.
- Products do not rot, mold or decompose under the influence of UV radiation.
- Manufacturing company constantly implements energy efficiency measures that reduce energy consumption and corresponding CO_2 emissions.
- Mandatory Energy audit of enterprise has been conducted in 2022 in accordance with Cabinet Regulation No. 487 “Regulations Regarding Energy Audit of Enterprises”. Local legislation mandates large enterprises and large consumers of electricity to conduct energy audit once in 4 years or implement certified Energy management system in accordance with ISO 50001.
- In accordance with Cabinet Regulation No. 769 “Regulations Regarding Participation of Stationary Technological Installations in the Emission Allowance Trading Scheme of the European Union”, report on GHG Emissions is issued on annual basis.
- Manufacturing company has obtained licenses for the extraction of minerals, as well as a permit for polluting activities (Category A) and operates in accordance with them.

Information related to Sector EPD

This is an individual EPD.

Differences versus previous versions

This is the first version of EPD.

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