ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Wienerberger Oy Ab
Loimu Vuolu Clay bricks and brick slips Product-EPD

Rakennustieto EPD

EPD Number:	RTS_384.14_25
Publication date:	6.6.2025
Valid until:	6.6.2030

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Wienerberger Oy Ab
Address	Kumpulantie 15, 00520 Helsinki
Contact details	office@wienerberger.fi
Website	https://www.wienerberger.fi

PRODUCT IDENTIFICATION

Component EPD product group	Clay bricks
Product name	Loimu Vuolu
Additional label(s)	
Product number / reference	23114165, 23124115, 23214115, 23234125, 23234135, 23234165
Place(s) of production	Koria, Finland

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes 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. 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. EN15804 impact assessment indicators are based on EF 3.1.

EPD INFORMATION

EPD program operator	Rakennustieto EPD, Malminkatu 16 A, 00100 Helsinki, Finland https://ymparisto.rakennustieto.fi/
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. RTS PCR 2020
Component EPD number	RTS_384.0_25
Product EPD number	RTS_384.14_25
Product EPD verifier	Anni Viitala, Granlund Oy
Product EPD publishing date	6.6.2025
Product EPD valid until	6.6.2030

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

VERIFICATION STATEMENT

Verified according to the requirements of EN 15804+A2 (product category rules) Independent verification of the declaration, according to EN ISO 14025:2010	
☒ External	☐ Internal
Third party verifier:  Anni Viitala, Granlund	

PRODUCT INFORMATION

PRODUCT DESCRIPTION

The main raw materials for brick products are clay, sand and water. Finnish clay contains iron compounds, which is reflected in the brick as a red hue after firing. Kaolin clay and lime are used in the production of the lightest bricks. In addition, mineral-based additives and engobes can be used in the brick mass, which affect the color tone of the brick.

The solid and perforated bricks as well as brick slips are produced by extruding method. Brick products are fired at over 1000 °C. The firing process can be fueled with either natural gas or biogas in the Koria brick factory. Bricks produced with biogas are available for purchase on request, but they are not within the scope of this EPD.

PRODUCT APPLICATION

Extruded bricks and brick slips are mainly used in façade solutions. Certain brick sizes can also be used in chimneys and fireplaces.

COMPONENT RAW MATERIAL COMPOSITION

Component	Contents	Declared unit	Origin	Renewable material content (%)	Non-renewable material content (%)	Post-consumer recycled material content (%)
Clay	100 % Clay	1 kg	FI / UK	0 %	100 %	0 %
Sand	100 % Sand	1 kg	FI	0 %	100 %	0 %
Lime	100 % Calcium carbonate	1 kg	FI	0 %	100 %	0 %
Sawdust	100 % Wood	1 kg	FI	100 %	0 %	0 %
Pigments	61 % Manganese Dioxide 39 % Chromite	1 kg	FI	0 %	100 %	0 %
Crushed brick	70 % Clay 24 % Sand 4 % Lime 1 % Sawdust 1 % Pigments	1 kg	FI	0 %	100 %	0 %
Natural gas	100 % Natural gas	1 kWh	EU	0 %	100 %	0 %
Wienerberger's manufacturing		1 kg				

PRODUCT COMPONENT COMPOSITION

Product-specific component quantities are presented in the table below

Component	Loimu Vuolu
Clay	0,62 kg
Sand	0,12 kg
Lime	0,11 kg
Sawdust	0,05 kg
Pigments	0,02 kg
Crushed brick	0,08 kg
Natural gas	0,55 kWh/kg
Wienerberger's manufacturing	1,0 kg

PACKAGING MATERIAL COMPOSITION

Main packaging materials of products per declared unit are presented in the table below.

Product	Quantity	Weight % of total
Wood pallets	0,0008 kg	42 %
Shrink hood	0,0012 kg	58 %
Total	0,0020 kg	

PRODUCT STANDARDS

All Wienerberger Koria plant bricks have a CE certificate and cover the standard SFS-EN 771-1+A1 requirements.

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	1 year, 2023

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 clay brick
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

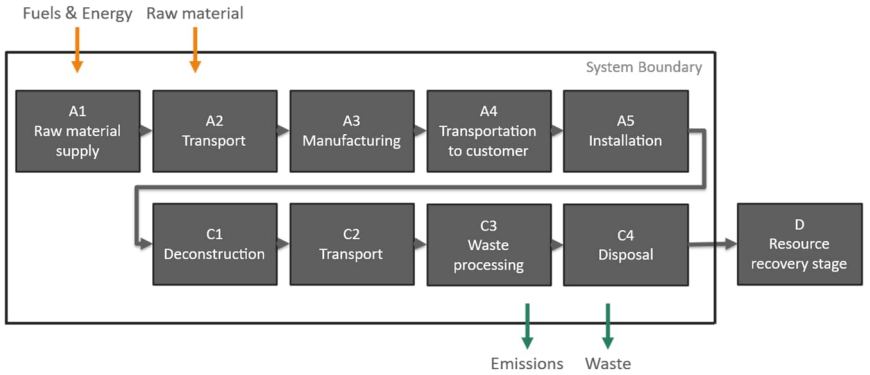
SYSTEM BOUNDARY

The studied system boundary was cradle to gate with options, modules C1–C4 and module D (A1–A3, A4, A5, C1-C4 and D).

	Product Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits and loads beyond the system boundary		
	Raw material supply	Transport	Manufacturing	Transport to building	Installation to building	Use/applications	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
Stage	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
Included	X	X	X	X	X								X	X	X	X	X	X	X
Relevancy	R	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	R	R	R	R	R	R	R

Mandatory
Mandatory as per the RTS PCR section 6.2.1 rules and terms
Optional modules based on scenarios

Studied system covers the following steps of life cycle according to EN 15804: **A1** Raw material supply**, A2** Transport, **A3** Manufacturing, **A4** Transportation to customer, **A5** Installation, **C1** Deconstruction, **C2** Transportation of end-of-life, **C3** Waste processing and **C4** Disposal. In addition, the benefits and loads beyond the system boundary of stage **D** consist of product reuse, recovery and recycling. System boundary describing the system boundary and the input and output flows is shown below:



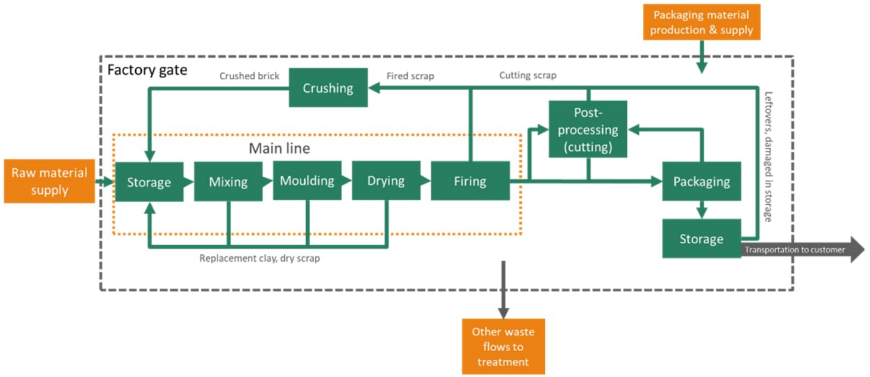
LCA System Boundary of studied products

The study does not omit any life cycle stages, processes or data needs that are mandatory according to EN 15804 and RTS PCR.

The end of waste (EoW) point of the production scraps is the point where it is processed to be ready to use in following life cycles. For example, for incinerated waste streams, it is the incineration of the materials, which results as energy that is then available for consumption in the following life cycle. For paper waste, it is ready to be used as secondary raw material after sorting. EoW point of the packaging materials collected for processing in A5 module is the point when materials are collected and handled in the sorting plant. EoW point of the studied product is the step when bricks are recycled and available to following life cycles as waste brick or collected for final disposal

THE PRODUCTION PROCESS OF THE STUDIED PRODUCT

Production stage (A3) of Wienerberger's production site covers the following manufacturing processes; raw material supply, processing and packaging the final product. After that, products are transported to the customer. The production processes of the studied product are presented in the following figure. Component "Crushed brick" represents the internally recycled production waste.



Wienerberger's production processes

CUT-OFF CRITERIA

This study follows the cut-off criteria stated in RTS PCR and EN 15804 -standard. This study does not exclude any modules or processes which represent more than 1 % of the emissions of the studied life cycle stage. The study does not exclude any hazardous materials or substances.

Excluded processes and the criteria for exclusion are given in the following table. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

Process excluded from study	Cut-off criteria	Quantified contribution from process
B1-B7 Use stage	Not relevant for the product group	-

ALLOCATION

Allocation rules used are made according to ISO14044:2006. Allocation is avoided when possible and when necessary, allocation is made based on physical shares and also avoiding double calculations. Allocation is required if the production process produces more than one product and the flows of materials, energy and waste cannot be separately measured for the studied product. Allocation used in generic data sources follow the requirements of the EN 15804 -standard. It should be noticed that the allocation method 'Allocation, cut-off, EN15804' has been used for EcoInvent 3.10.1 data, which complies with EN 15804.

Avoiding allocation could not be avoided for following inputs as the information was only measured on factory process level.

Electricity consumption, fuels for processing: only measured on factory level.

Production waste flows: only measured on factory level.

Production water consumption: only measured on factory level

Packaging materials: only measured on factory level.

According to EN 15804, flows leaving the system at the end-of-waste boundary of the product stage (A1-A3) are allocated as co-products. According to EN 15804, processes that has a very low contribution to the overall revenue may be neglected in co-product allocation.

KEY ASSUMPTIONS

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

End of life scenario: EAA's 2020 end-of-life data was utilized. The mineral waste from construction and demolition -waste category was assumed to be the most compatible for the product. According to EAA 2020, end-of-life data for mineral waste from construction and demolition, 88.4% of the mineral waste is recycled (including backfilling) and the remaining 11.6% goes to final disposal (including energy recovery). (EAA 2020.)

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives. Material flows at the end of life were assumed to be following:

C1 Deconstruction/demolition: During the demolition phase C1, the entire final product is dismantled, using the mass of the final product as the input data. The energy use (diesel usage) in the demolition stage is 1,30 kWh/t (Erlandsson, M. & Pettersson, D., 2015.)

C2 Transportation: Transportation distance 75 km road driving by lorry. (SYKE 2021.)

C3-C4 Waste treatment and final disposal: For clay bricks, EAA mineral waste from construction and demolition in 2020 end-of-life data is utilized, with 88.4% of the mineral waste being recycled (including backfilling) and the remaining 11.6% going to final disposal (including energy recovery). (EAA 2020.)

Module D covers the net benefits and loads arising from the reuse of products or the recycling or recovery of energy from end-of-waste state materials. Waste brick can be used in backfilling or in other different filling applications.

DATA QUALITY

The quality requirements for the life cycle assessment were set according to the EN ISO 14044 standard (4.2.3.6) and EN 15804 standard (6.3.7).

This LCA study follows the standard EN 15804:2012+A2:2019 and RTS PCR and no decisions are made based on the values. The study does not consider long-term emissions (i.e. over 100 years). Impact assessment characterization factors are aligned with EF 3.1. 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 calculations were conducted using One Click LCA -tool which is a cloud-based LCA software in compliance with EN 15804 -standard.

PROCEDURED FOR COLLECTION PROCESS SPECIFIC DATA

Production specific data was collected directly from the manufacturer's production plant. The data represents the production of the studied product at the plant from the materials transported to the facility and represents 1 year average. The data represents the year 2023, which was the latest year with full year data. All gathered data was used without excluding categories in advance following the system boundaries set in earlier chapters.

CRITERIA FOR CHOOSING THE GENERIC DATA

Generic data that was used for upstream and downstream processes represents complementary data from EcoInvent 3.10.1 database.

The datasets were chosen to represent the studied system as closely as possible. When available supplier specific information was used for instance in form of EN 15804 EPDs or emissions profile of local energy supplier. When supplier-specific information was not available the information sources were chosen based on their technical and geographical representativeness. Only when country specific or European data has not been available has global level data been used (concerns mainly data from EcoInvent 3.10.1.)

As up-to-date data as possible was chosen and no more than five years old for producer specific data and ten years for generic data was used.

ENVIRONMENTAL IMPACT DATA

LOIMU VUOLU

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	2.76E-01	1.42E-02	1.44E-03	4.69E-04	8.08E-03	3.18E-03	2.50E-03	-1.64E-02
GWP – fossil	kg CO_2e	2.77E-01	1.42E-02	7.31E-05	4.69E-04	8.07E-03	3.18E-03	2.49E-03	-1.64E-02
GWP – biogenic	kg CO_2e	-1.36E-03	0.00E+00	1.36E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP – LULUC	kg CO_2e	1.02E-04	6.37E-06	9.15E-09	4.80E-08	3.61E-06	3.26E-07	5.44E-06	-1.26E-05
Ozone depletion pot.	kg CFC_{-11}e	8.00E-09	2.10E-10	1.52E-13	7.18E-12	1.19E-10	4.87E-11	4.97E-11	-1.79E-10
Acidification potential	mol H^+e	7.02E-04	4.85E-05	4.83E-08	4.23E-06	2.75E-05	2.87E-05	1.51E-05	-1.02E-04
EP-freshwater[3)]	kg Pe	2.06E-05	1.11E-06	1.13E-09	1.35E-08	6.28E-07	9.17E-08	1.82E-07	-3.61E-06
EP-marine	kg Ne	1.80E-04	1.59E-05	1.95E-08	1.96E-06	9.04E-06	1.33E-05	6.05E-06	-2.85E-05
EP-terrestrial	mol Ne	1.96E-03	1.73E-04	1.91E-07	2.15E-05	9.84E-05	1.46E-04	6.57E-05	-3.26E-04
POCP ("smog")	kg NMVOCe	7.49E-04	7.15E-05	6.43E-08	6.41E-06	4.06E-05	4.34E-05	2.21E-05	-9.96E-05
ADP-minerals & metals	kg Sbe	1.99E-06	3.97E-08	2.91E-11	1.68E-10	2.25E-08	1.14E-09	5.66E-09	-7.85E-08
ADP-fossil resources	MJ	3.39E+00	2.06E-01	1.40E-04	6.13E-03	1.17E-01	4.16E-02	4.25E-02	-2.13E-01
Water use[2)]	m^3e depr.	1.50E-01	1.02E-03	4.99E-06	1.53E-05	5.79E-04	1.04E-04	1.62E-04	-1.40E-02

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) 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 experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	-1.02E-01	2.84E-03	-3.96E-04	3.88E-05	1.61E-03	2.63E-04	4.94E-04	-1.28E-02
Renew. PER as material	MJ	1.19E-02	0.00E+00	-1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renew. PER	MJ	-9.04E-02	2.84E-03	-1.23E-02	3.88E-05	1.61E-03	2.63E-04	4.94E-04	-1.28E-02
Non-re. PER as energy	MJ	3.32E+00	2.06E-01	-8.42E-04	6.13E-03	1.17E-01	4.16E-02	4.25E-02	-2.13E-01
Non-re. PER as material	MJ	7.88E-04	0.00E+00	-7.88E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-ren. PER	MJ	3.32E+00	2.06E-01	-1.63E-03	6.13E-03	1.17E-01	4.16E-02	4.25E-02	-2.13E-01
Secondary materials	kg	8.36E-04	8.80E-05	7.03E-08	2.55E-06	4.99E-05	1.73E-05	1.54E-05	8.84E-01
Renew. secondary fuels	MJ	4.43E-04	1.11E-06	1.12E-09	6.66E-09	6.33E-07	4.51E-08	2.08E-07	-1.34E-06
Non-ren. secondary fuels	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
Use of net fresh water	m^3	3.80E-03	3.06E-05	9.48E-08	4.05E-07	1.73E-05	2.75E-06	2.18E-05	-3.35E-04

1)PER = primary energy resources; Non-ren = Non renewable

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	4.94E-03	3.50E-04	1.37E-06	6.82E-06	1.98E-04	4.63E-05	6.08E-05	-1.07E-03
Non-hazardous waste	kg	1.51E-01	6.47E-03	3.59E-05	9.30E-05	3.67E-03	6.31E-04	1.18E-03	-1.99E-02
Radioactive waste	kg	6.69E-06	4.47E-08	5.76E-11	6.72E-10	2.53E-08	4.56E-09	7.52E-09	-2.47E-07

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	7.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.12E-03	0.00E+00	4.00E-05	0.00E+00	0.00E+00	8.84E-01	0.00E+00	0.00E+00
Materials for energy recovery	kg	1.16E-03	0.00E+00	2.70E-05	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

BIOGENIC CARBON CONTENT

Biogenic carbon content	Unit (expressed per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	0,001 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO2

SCENARIO DOCUMENTATION

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

Scenario parameter	Value
Electricity data source and quality	Electricity production, hydro, reservoir, alpine region. EN15804+A2, Norway, 2024. Ecoinvent 3.10.1 Electricity production, wind, 1-3MW turbine, onshore. EN15804+A2, Sweden, 2024. Ecoinvent 3.10.1
Electricity CO_2e / kWh	0,0072 kg CO2e / kWh

TRANSPORTATION SCENARIO

Parameter	Value
Fuel type and consumption of vehicle used for transport	Truck: diesel, maximum load capacity 34 t. Specific transport emissions 0,11 kg CO_2 equiv. / tkm
Distance (km)	Average transport distance 132 km
Capacity utilization (%)	100 % for truck
Density of transported products (kg/m3)	Density varies depending on the mass and size of the product type
Volume capacity utilization factor	1

INSTALLATION OF THE PRODUCT IN THE BUILDING

Parameter	Unit
Ancillary materials for installation (specified by material)	Disposable gloves (not included in the analysis due to insignificant amount)
Water use	0 m^3
Other resource use	0 kWh (energy use is insignificant)
Quantitative description of energy type (regional mix) and consumption during the installation process	
Waste materials generated by product installation	Packaging materials per 1 kg of products: Wood pallets 0,0008 kg Shrink hood 0,0012 kg

END OF LIFE SCENARIO DOCUMENTATION

		Clay brick
Process flow		Mass
Collection process specified by type	kg collected separately	1,0 kg
	kg collected with mixed construction waste	-
Recovery system specified by type	kg for reuse	-
	kg for recycling	0,884 kg
	kg for energy recovery	-
Disposal specified by type	kg material for final deposition	0,116 kg
Assumptions for scenario development	units as appropriate	Waste materials are transported 75 km by truck to recycling facility with a truck capacity utilization of 45%

REFERENCES

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

EN 15804:2012+A2:2021 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

Ecoinvent database v3.10.1, System model: Allocation, cut-off, EN15804 (2024)

One Click LCA EPD Generator for EPD Hub V3

The Building Information Foundation RTS (RTS EPD Product Category Rules). Rakennustietosäätiö RTS sr (RTS EPD PCR menetelmäohje 15804:2019, 26.8.2020)

The Finnish RTS EPD programme RTS EPD Guideline, 18.2.2021

Emissions database for construction, Finnish Environmental Institute, 2023. Available at: https://co2data.fi/

EAA. 2020. European Environment Agency. Available at: https://www.eea.europa.eu/ds_resolveuid/b1460a4479c940859297359644449a49

ANNEX 1: EPD RESULTS BY RTS PCR REQUIREMENTS

LOIMU VUOLU

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e/kg	2.76E-01	1.42E-02	1.44E-03	4.69E-04	8.08E-03	3.18E-03	2.50E-03	-1.64E-02
ADP-minerals & metals	kg Sbe/kg	1.99E-06	3.97E-08	2.91E-11	1.68E-10	2.25E-08	1.14E-09	5.66E-09	-7.85E-08
ADP-fossil	MJ/kg	3.39E+00	2.06E-01	1.40E-04	6.13E-03	1.17E-01	4.16E-02	4.25E-02	-2.13E-01
Water use	m3e depr. /kg	1.50E-01	1.02E-03	4.99E-06	1.53E-05	5.79E-04	1.04E-04	1.62E-04	-1.40E-02
Secondary materials	kg/kg	8.36E-04	8.80E-05	7.03E-08	2.55E-06	4.99E-05	1.73E-05	1.54E-05	8.84E-01
Biog. C in product	kg C/kg	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C/kg	0,001	N/A	N/A	N/A	N/A	N/A	N/A	N/A