Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804

Büscher wall

Registration number:	EPD-Kiwa-EE-197938-EN
Issue date:	14-04-2025
Valid until:	14-04-2030
Declaration owner:	Betonwerk Büscher GmbH & Co. KG
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Büscher wall

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-197938-EN

1.3 VALIDITY

Issue date: 14-04-2025

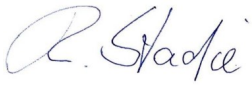
Valid until: 14-04-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Manufacturer: Betonwerk Büscher GmbH & Co. KG

Address: Bült 54, 48619 Heek

E-mail: overbeeke@buescher-containerdienst.de

Website: https://www.buescher-betonfertigteile.de/

Production location: Betonwerk Büscher

Address production location: Bült 54, 48619 Heek

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Elisabeth Amat Guasch, Greenize

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

PCR A: Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules, Version 2.1, 2022-02-14

PCR B: Nachhaltigkeit von Bauwerken –Umweltproduktdeklarationen - Produktkategorieregeln für Beton und Betonelemente; Deutsche Fassung BS EN 16757, 2022-11-01

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2. For

1 General information

the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.1

Characterization method: EN 15804 +A2 Method v1.0

LCA database profiles: ÖKOBAUDAT 2024-I Datensätze (GaBi)

Version database: 2024-I

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Büscher wall ' with the calculation identifier ReTHiNK-97938.

2 Product

2.1 PRODUCT DESCRIPTION

The Büscher wall, approved by the German Institute for Building Technology (DIBt) under the number Z-3.51-2184, is a concrete wall produced out of recycled concrete. It aims to dispense the use of primary raw materials such as gravel and sand and instead relies on recycled building materials such as natural stone substitute. This replacement material consists of mixed construction waste (similar to type 3). The fine portion of the aggregate (<200 mm) can also be substituted.

The EPD is created on the basis of the standard thickness for the Büscher-Wall, which is 14cm.
As the wall comes in different thicknesses, a conversion factor can be used on the inputs and results to get the data for the specific differing thicknesses.
These are as follows:

- 14 cm : Standard thickness → factor 1
- 12 cm : Lowest thickness → factor 0,8571
- 16 cm : Moderate thickness → factor 1,1429
- 18 cm : Maximum thickness → factor 1,2857

The product is being distributed as bulk material.

Ingredient	~ Composition
Cement	~15-25%
Recycled aggregate	~70-80%
Water	~7-17%
Ancillary materials	~0-2%

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The Büscher wall is ideal for a wide range of applications (indoors) up to building class 4. This includes:

- load-bearing wall
- non-load-bearing wall
- fire wall
- decorative wall

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The reference service life could not be determined in accordance with ISO 15686-1. According to the service lives of building components for life cycle analyses in accordance with the Assessment System for Sustainable Building BBSR Table 2017, the reference service life of precast concrete elements is over 50 years. Adding to this, the reference service live has not been taken into account in this EPD since the calculation method used to determine B1 is not taking the RSL into account.

USED RSL (YR) IN THIS LCA CALCULATION:

50

2.4 TECHNICAL DATA

The R-concrete from Betonwerk Büscher GmbH & Co. KG for the Büscher wall is a normal concrete of strength class strength class C20/25 or higher in accordance with DIN EN 206-1 in conjunction with DIN 1045-2 using a recycled aggregate in accordance with DIN EN 12620 in conjunction with DIN 4226-101 which deviates from the German Committee for Reinforced Concrete (DAfStb) guideline "Concrete with recycled aggregates". Technical data beyond the one displayed here can be found in the approval document by the German Institute for Building Technology (DIBt) under the number Z-3.51-2184.

The technical specifications of the Büscher wall include:

- Concrete quality: >= C 20/25
- Frost resistance DIN CEN/TS 12390-3: < 1000 g/m³
- E-modulus reduction to normal concrete: - 45 %
- Final creep coefficient for design factor to normal concrete: * 1.5

2.5 SUBSTANCES OF VERY HIGH CONCERN

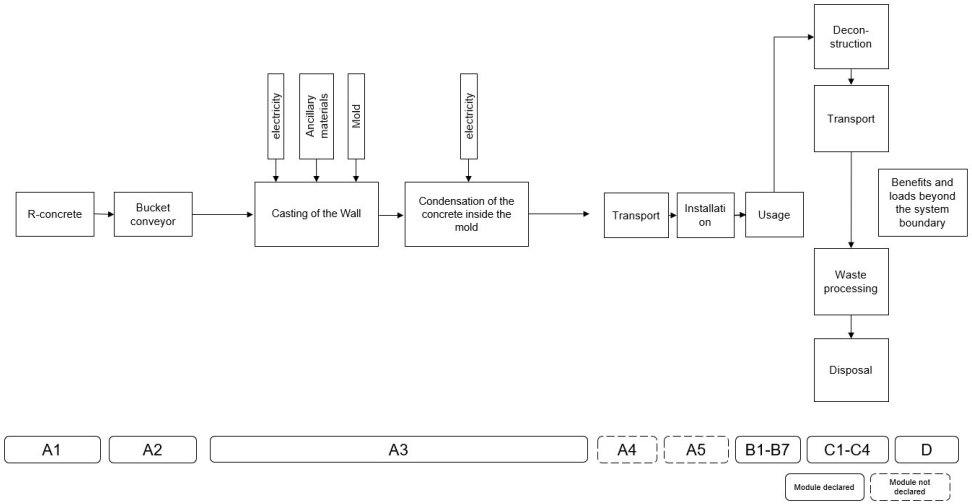
The product was tested for hazardous substances according to DIN EN 12620 and DIN 4226-101. Either the hazardous substances were not measurable or below the limits set forth by the standards.

2.6 DESCRIPTION PRODUCTION PROCESS

The Büscher wall is manufactured horizontally or vertically in steel or in wooden molds. The contact surfaces of the mold with the building material mixture are treated with a release agent adapted to the materials to prevent adhesion. The release agent is applied as a fine spray mist.

2 Product

After production, the building material mix is incorporated in the mixer and poured into the mold from the concrete silo with a minimum drop height and distributed evenly. Depending on the dimensions of the mold, the mixture is properly deaerated and compacted using an internal and/or external vibrator to ensure a low air void content in the mixture.
The dwell time of the component in the formwork is usually approx. 16 hours without heat supply, or until the hardness required for transport is reached. A crane transports the component to the finishing area in the outdoor storage area. The wall remains here until it is transported to the construction site, while taking into consideration the needed time for finishing treatments.



3 Calculation rules

3.1 FUNCTIONAL UNIT

m²

One m² of a 14cm thick concrete wall, made out of R-concrete

Reference unit: square meter (m2)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	m2
Weight per reference unit	300.843	kg
Conversion factor to 1 kg	0.003324	m2

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options, modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	X	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for the Büscher wall with a thickness of 14 cm to 18 cm. The results shown are, as noted in the product description, based on the data of the 14 cm version and can be converted by using the conversion factors provided. The Büscher wall is a product of Betonwerke Büscher Gmbh & Co. KG. The data is representative of the company's products for the geographical location Germany.

3.5 CUT-OFF CRITERIA

Product Stage (A1-A3)

3 Calculation rules

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.
More specifically for this calculation, the manufacturing process of the equipment, buildings and any other capital goods used in the precast concrete product production have not been included. Also not considered was the transportation of personnel to the plant, within the plant, research and development activities and long-term emissions.

End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Benefits and Loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

3.6 ALLOCATION

Allocation has not been applied in this LCA.

3.7 DATA COLLECTION & REFERENCE PERIOD

Primary data was collected and provided by Betonwerke Büscher internally. As the product for which the EPD is created is based on a precise recipe, the used raw materials stem from the most current iteration of that recipe. Thus, the raw material data has been collected in 2023.
Transportation distances are based on the distances of the production plant and the suppliers that are being used in the year 2023.
The electricity usage was determined using the average energy consumption of each machine being used for one minute in between 4 and 6 runs. Through this, an average consumption per minute was calculated and applied to the exact times the production of one m2 of concrete needs at the specific machine.

3.8 ESTIMATES AND ASSUMPTIONS

The weight of the mold was determined on the basis of its reusability. As it can be used approximately 40 times and weighs around 11,2kg, 0,28kg per DU has been chosen.

For the deconstruction of the product (module C1), a scenario was developed that reflects the average deconstruction process. Weight of the raw material taken into relation of hourly demolition potential. The same approach was used in regard to the debris removal. The value was, thus, taken from an NMD dataset, that has been entered in R<THiNK. Summarizing, two inputs have been made in C1, one for demolishing and one for debris removal by excavators.

The distances from the place of use to the respective waste treatment have been provided by the company on an average based on its internal data.

Module B1 was declared in this EPD and the carbonation process according to EN 16757 is shown in it.

Carbonation represents the natural process of partial reabsorption of the CO2 emitted during cement production. This CO2 is bound in the concrete and contributes to its hardening. The amount of CO2 that is bound is based on different variables, which are described in EN 16757 in Annex G.

The amount of bound CO2 shown in B1 corresponds to the table shown in Annex G 3.2 and makes an assumption for the m^2/m^3 ratio. Based on the cement used and the calculated m^2/m^3 ratio for the Büscher products, it was determined, that 15 kg of CO2 are being bound during the usage phase.

While the carbonation in the use phase (B1) is taken into account, the potential for total carbonation in the further use of recycled concrete is not considered in the calculation. For the long-term absorption of CO2, a guideline value of 75% is specified as the maximum possible absorption in EN 16757. It is emphasized that this value should be understood as a reference value, as it depends on many different variables.
For the Büscher wall this value is **16,96 kg CO2 / m^3.**

3.9 DATA QUALITY

The data is comprised of primary data directly collected by Betonwerke Büscher. It stems from the internal controlling, the exact measurements of the recipe for the product and measurements of the energy usage of singular machines used in the process. According to the criteria of the "UN Environmental Global Guidance on LCA database development" mentioned in EN 15804+A2, the data quality for all three representativeness categories (geographical, technical and time) can be described as good.
In addition, secondary data from the ÖKOBAUDAT database (2024-I) was used. The

3 Calculation rules

database is checked regularly and therefore meets the requirements of DIN EN ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804+A2.

The general rule that specific data from certain production processes or average data derived from certain processes must take precedence when calculating an EPD or LCA was upheld. Data for processes over which the manufacturer has no influence were assigned to generic data.

3.10 POWER MIX

The electricity mix was chosen according to the average renewable mix delivered to Betonwerk Büscher GmbH in the reference year 2023. The calculation of this electricity mix followed the market based approach. No CO2 certificates were counted.

4 Scenarios and additional technical information

4.1 USE STAGE (B1)

Emissions to air/soil/water are applicable, the scenario accounted in module B1 is as follows in the table below:

Description	Cycle (yr)	Number of cycles	Amount per cycle	Total Amount	Unit
Carbonation	50	1	-15000000	-15000000	mg

4.2 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at end of life.

Description	Amount	Unit
Hydraulic excavator	0.031	h
Hydraulic excavator	0.036	h

4.3 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
concrete (i.a. elements, brickwork, reinforced concrete) Büscher	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)	0	0	0	30	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4 Scenarios and additional technical information

4.4 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables.
First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
concrete (i.a. elements, brickwork, reinforced concrete) Büscher	DE	0	0	0	100	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
concrete (i.a. elements, brickwork, reinforced concrete) Büscher	0.000	0.000	0.000	300.843	0.000
Total	**0.000**	**0.000**	**0.000**	**300.843**	**0.000**

4.5 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
concrete (i.a. elements, brickwork, reinforced concrete) Büscher	75.443	0.000
Total	**75.443**	**0.000**

5 Results

For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER SQUARE METER

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	B1	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	3.10E+1	6.54E-1	5.08E+0	3.67E+1	-1.50E+1	4.08E+0	1.22E+0	4.90E-1	0.00E+0	-3.18E-1
GWP-f	kg CO_2 eq.	3.09E+1	6.54E-1	5.03E+0	3.66E+1	-1.50E+1	4.10E+0	1.22E+0	4.89E-1	0.00E+0	-3.17E-1
GWP-b	kg CO_2 eq.	5.49E-2	2.64E-4	4.42E-2	9.93E-2	0.00E+0	-9.39E-2	4.91E-4	7.75E-4	0.00E+0	-8.09E-4
GWP-luluc	kg CO_2 eq.	3.21E-3	2.40E-4	9.29E-3	1.27E-2	0.00E+0	7.56E-2	4.47E-4	9.31E-5	0.00E+0	-3.40E-4
ODP	kg CFC 11 eq.	5.28E-14	1.44E-7	2.25E-9	1.47E-7	0.00E+0	9.18E-13	2.69E-7	6.35E-8	0.00E+0	-3.16E-8
AP	mol H+ eq.	5.58E-2	3.79E-3	3.88E-2	9.83E-2	0.00E+0	1.96E-2	7.07E-3	3.07E-3	0.00E+0	-2.29E-3
EP-fw	kg P eq.	3.59E-6	6.59E-6	2.46E-6	1.26E-5	0.00E+0	1.06E-5	1.23E-5	1.52E-5	0.00E+0	-1.17E-5
EP-m	kg N eq.	1.54E-2	1.34E-3	1.71E-2	3.38E-2	0.00E+0	9.24E-3	2.49E-3	1.22E-3	0.00E+0	-6.55E-4
EP-T	mol N eq.	1.90E-1	1.47E-2	3.97E-3	2.08E-1	0.00E+0	1.03E-1	2.74E-2	1.36E-2	0.00E+0	-7.60E-3
POCP	kg NMVOC eq.	4.50E-2	4.21E-3	5.18E-2	1.01E-1	0.00E+0	2.63E-2	7.83E-3	3.69E-3	0.00E+0	-2.10E-3
ADP-mm	kg Sb-eq.	0.00E+0	1.66E-5	5.04E-1	5.04E-1	0.00E+0	6.65E-7	3.09E-5	1.38E-6	0.00E+0	-1.58E-5
ADP-f	MJ	1.12E+2	9.86E+0	5.10E+1	1.73E+2	0.00E+0	5.12E+1	1.84E+1	6.57E+0	0.00E+0	-3.95E+0
WDP	m3 world eq.	1.61E+0	3.53E-2	1.29E-1	1.77E+0	0.00E+0	2.77E-2	6.57E-2	2.98E-2	0.00E+0	-4.54E+0

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	B1	C1	C2	C3	C4	D
PM	disease incidence	4.30E-7	5.86E-8	2.10E-9	4.91E-7	0.00E+0	0.00E+0	1.09E-7	6.77E-8	0.00E+0	-3.94E-8
IR	kBq U235 eq.	5.14E-1	4.13E-2	6.02E-4	5.56E-1	0.00E+0	0.00E+0	7.70E-2	2.08E-2	0.00E+0	-1.59E-2
ETP-fw	CTUe	2.81E+1	8.79E+0	6.29E-1	3.75E+1	0.00E+0	0.00E+0	1.64E+1	5.33E+0	0.00E+0	-6.37E+0
HTP-c	CTUh	2.07E-9	2.85E-10	8.25E-11	2.43E-9	0.00E+0	0.00E+0	5.32E-10	1.26E-10	0.00E+0	-2.35E-10
HTP-nc	CTUh	2.75E-7	9.64E-9	5.54E-10	2.85E-7	0.00E+0	0.00E+0	1.80E-8	3.57E-9	0.00E+0	-6.65E-9
SQP	Pt	3.14E+0	8.55E+0	4.94E-1	1.22E+1	0.00E+0	0.00E+0	1.59E+1	1.10E+0	0.00E+0	-5.10E+0

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – 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.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	B1	C1	C2	C3	C4	D
PERE	MJ	6.84E+0	1.23E-1	1.12E+1	1.82E+1	0.00E+0	5.56E+0	2.30E-1	3.74E-1	0.00E+0	-2.74E-1
PERM	MJ	4.72E-2	0.00E+0	4.84E+0	4.89E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	6.88E+0	1.23E-1	1.61E+1	2.31E+1	0.00E+0	5.56E+0	2.30E-1	3.74E-1	0.00E+0	-2.74E-1
PENRE	MJ	1.22E+2	1.05E+1	5.16E+1	1.84E+2	0.00E+0	5.12E+1	1.95E+1	7.01E+0	0.00E+0	-4.19E+0
PENRM	MJ	2.33E+0	0.00E+0	2.22E-3	2.33E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	1.24E+2	1.05E+1	5.16E+1	1.86E+2	0.00E+0	5.12E+1	1.95E+1	7.01E+0	0.00E+0	-4.19E+0
SM	Kg	2.26E+2	0.00E+0	0.00E+0	2.26E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	4.53E+1	0.00E+0	0.00E+0	4.53E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	6.76E+1	0.00E+0	0.00E+0	6.76E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	5.91E-2	1.20E-3	1.24E-2	7.28E-2	0.00E+0	5.28E-3	2.24E-3	2.20E-3	0.00E+0	-1.06E-1

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**=Net use of fresh water

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	B1	C1	C2	C3	C4	D
HWD	Kg	2.08E-7	2.50E-5	4.78E-7	2.57E-5	0.00E+0	2.18E-9	4.66E-5	1.14E-5	0.00E+0	-7.98E-6
NHWD	Kg	6.57E-2	6.26E-1	3.29E-1	1.02E+0	0.00E+0	8.48E-3	1.17E+0	9.16E-1	0.00E+0	-4.28E-2
RWD	Kg	6.83E-3	6.49E-5	4.50E-4	7.35E-3	0.00E+0	6.92E-5	1.21E-4	2.95E-5	0.00E+0	-1.73E-5

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	B1	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	1.40E-2	1.40E-2	0.00E+0	0.00E+0	0.00E+0	3.01E+2	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	2.10E-4	2.10E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

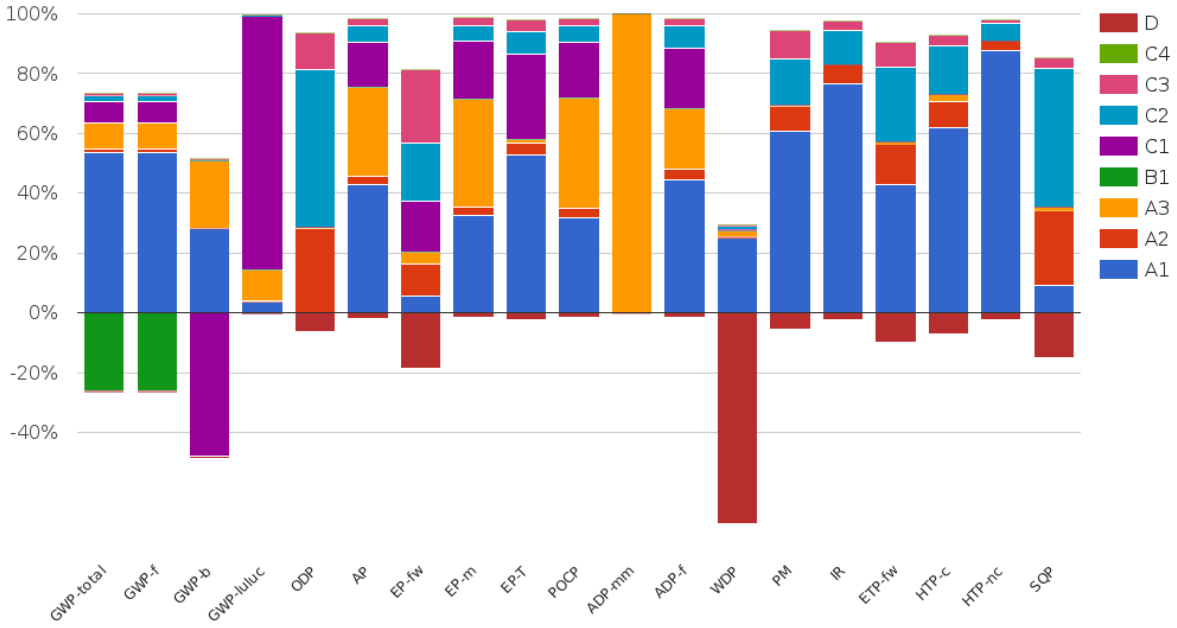
5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER SQUARE METER

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per square meter:

Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

6 Interpretation of results



The most significant contribution to the Global Warming potential (GWP-total) is the production stage (A1-A3) with a contribution of ~82%. Most of this impact stems from (A1).

In all of the other impact categories, (A1), (A3), (C1) and/or (C2) prove to be most impactful. Apart from GWP, (A1) is showing especially high impacts in Human toxicity, cancer (HTP-nc) with ~82% and Resource use, fossils (ADP-f) with a ~60% contribution. (A3) has a benefit of around -50% in Global Warming Potential-biogenic due to the use of a wooden mold. It is further highly impactful in Global Warming Potential-luluc and in land use (SQP). (C1) is especially impactful in Particulate Matter (PM), Ozone depletion (ODP) and Photochemical ozone formation - human health (POCP) with between ~45% to ~60% contribution. (C2) has a ~45% to 60% impact in Resource use, minerals and metals (ADP-mm).

6 Interpretation of results

(D) has a benefit of around -60% in Water Depletion (WDP).

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14040:2006

ISO 14025
ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

General PCR Ecobility Experts
Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules, Version 2.1, 2022-02-14

PCR B concrete and concrete elements
Nachhaltigkeit von Bauwerken –Umweltproduktdeklarationen - Produktkategorieregeln für Beton und Betonelemente; Deutsche Fassung BS EN 16757, 2022-11-01

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