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

# Square formwork


| | |
|---|---|
| Registration number: | EPD-Kiwa-EE-190020-EN |
| Issue date: | 19-02-2025 |
| Valid until: | 19-02-2030 |
| Declaration owner: | BAG® Bauartikel GmbH |
| Publisher: | Kiwa-Ecobility Experts |
| Programme operator: | Kiwa-Ecobility Experts |
| Status: | verified |

# 1 General information

## 1.1 PRODUCT

Square formwork

## 1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-190020-EN

## 1.3 VALIDITY

**Issue date:** 19-02-2025

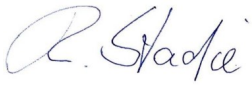
**Valid until:** 19-02-2030

## 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:** BAG® Bauartikel GmbH

**Address:** Zotzenheimer Straße 64a , 55576 Sprendlingen, Germany

**E-mail:** zentrale@bagbauartikel.com

**Website:** https://www.bagbauartikel.info/

**Production location:** BAG® Bauartikel GmbH

**Address production location:** Zotzenheimer Straße 64a, 55576 Sprendlingen, Germany

## 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

Lucas Pedro Berman, Senda

## 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

Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

## 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 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

# 1 General information

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:** EcoInvent version 3.6

**Version database:** v3.17 (2024-05-22)

** 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 'Square formwork ' with the calculation identifier ReTHiNK-90020.

# 2 Product

## 2.1 PRODUCT DESCRIPTION

The square formwork is produced by BAG® Bauartikel GmbH. This is a scaling EPD, which contains products with dimension from 175 mm x 240 mm to 600 mm x 600 mm.

The raw and auxiliary materials are listed in Table 1. These refer to the raw materials used at the Sprendlingen site. The quantities are based on the regional specifications of the raw materials.

**Table 1: Raw and auxiliary materials**

| Name | Unit | Value |
|---|---|---|
| EPS hard foam | Vol.-% | 35% - 57% |
| Wood | Vol.-% | 40% - 59% |
| Tape | Vol.-% | 3% - 6% |

## 2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The product is a disposable formwork system designed for single-use in concrete construction projects, providing temporary support for shaping and holding poured concrete until it sets and achieves the desired structure. This system is particularly advantageous for projects requiring efficient and cost-effective formwork solutions, offering simple and quick opening with the help of a knife. It allows for energy-saving and residue-free removal of the formwork from the concrete column, ensuring smooth and closed concrete surfaces. The formwork is very lightweight, making it easy to handle and position manually, and crane usage is not required for normal lengths. Users are required to adhere to the provided processing instructions for optimal results. All rectangular formworks can also be supplied with a "sharp edge" design; however, this may result in longer delivery times as the material for this option is not kept in stock.

## 2.3 REFERENCE SERVICE LIFE

### RSL PRODUCT

The product is designed for single use and will be removed after a few days. Adding to this, the reference service live has not been taken into account in this caluclation since the Use stage (modules B1-B7) is not declared.

### USED RSL (YR) IN THIS LCA CALCULATION:

1

## 2.4 TECHNICAL DATA

**Standard dimensions**: from 175 mm x 240 mm to 600 mm x 600 mm

**Stand lengths**: 3 or 4 m

**Wall thickness**: mininum 28 mm

**Finishes**: Smooth. Standard with 30 mm bevel and sharp edge

**Exposed concrete class**: SB4 in 3 and 4 m possible with smooth finish

## 2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any (or less than 0.1%) of the substances from the "*Candidate List of Substances of Very High Concern for Authorization*" (SVHC).

## 2.6 DESCRIPTION PRODUCTION PROCESS

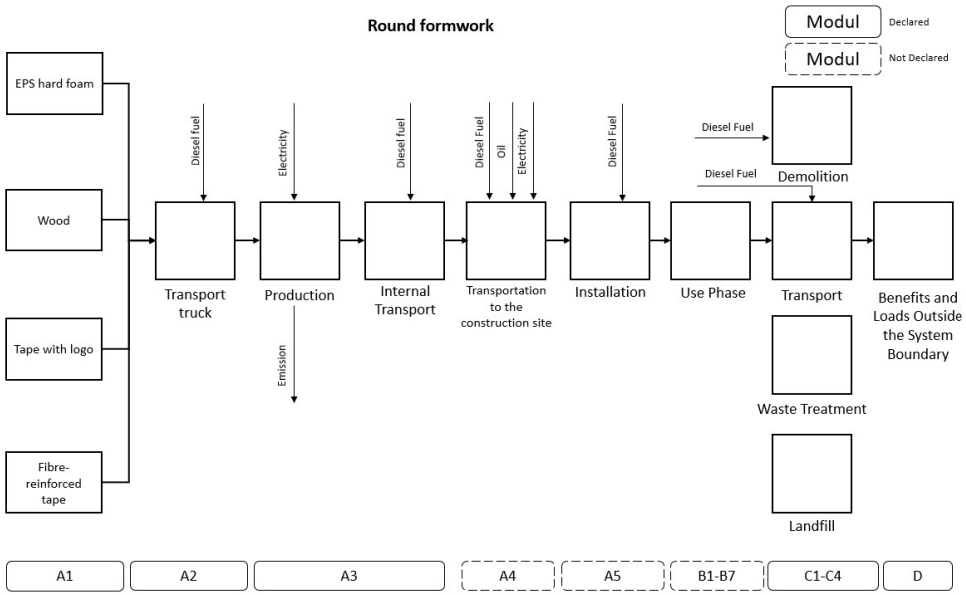
BAG® Bauartikel GmbH manufactures the square formworks made out of the raw materials listed in Table 1.

Polystyrene blocks and meter-long pieces of polystyrene sheets (for square or rectangular pipes) are sourced along with wooden inlays, adhesive tape, and glass-fiber-reinforced adhesive tape. The raw materials, including polystyrene blocks, wooden components, and adhesives, are transported to the production facility.

Once at facility, polystyrene blocks or sheets are cut to the desired dimensions using EPS cutting machines, based on whether square or rectangular pipes are being produced. At the assembly site, the wooden inlay is placed into the polystyrene formwork, and the formwork is closed with its corresponding counterpart from above. The assembled formwork is secured with adhesive tape. Heads are attached to the top and bottom of the formwork to prevent concrete from leaking between the wooden inlay and the polystyrene shell during use. The formwork is transported to the wrapping machines, where it is wrapped and reinforced with glass-fiber-reinforced adhesive tape to ensure durability and strength. Finally, the BAG adhesive tape, containing processing instructions and the concreting direction, is applied to the formwork, completing the manufacturing process.

The finished products are delivered directly to customers without any additional packaging.

# 2 Product


Round formwork
Modul
Declared
Modul
Not Declared
EPS hard foam
Wood
Tape with logo
Fibre-reinforced tape
Diesel fuel
Electricity
Diesel fuel
Diesel Fuel
Oil
Electricity
Diesel Fuel
Diesel Fuel
Diesel Fuel
Demolition
Transport truck
Production
Internal Transport
Transportation to the construction site
Installation
Use Phase
Transport
Benefits and Loads Outside the System Boundary
Emission
Waste Treatment
Landfill
A1
A2
A3
A4
A5
B1-B7
C1-C4
D

# 3 Calculation rules

## 3.1 DECLARED UNIT

**1 m**

1 linear meter (kg/m) of square formwork

Reference unit: meter ($m^1$)

## 3.2 CONVERSION FACTORS

| Description | Value | Unit |
|---|---|---|
| Reference unit | 1 | $m^1$ |
| Weight per reference unit | 1.221 | kg |
| Conversion factor to 1 kg | 0.818666 | $m^1$ |

## 3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with 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 | ND | 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 Square formwork , a product of BAG® Bauartikel GmbH. The results of this EPD are representative for Germany.

## 3.5 CUT-OFF CRITERIA

**Product stage (A1-A3)**

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

# 3 Calculation rules

therefore not exceed the limit of 5% of energy use and mass. No packaging has been used for this product during the transportation.

Excluded processes are:

- Long-term emissions
- The manufacture of equipment used in production, buildings or any other capital goods;
- The transport of personnel to the plant;
- The transportation of personnel within the plant;
- Research and development activities

**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

Allocations were avoided as far as possible. No by-products or co-products are produced during the manufacture of the analysed product. The energy requirements of production were allocated to the individual products on the basis of energy consumption measurements. Specific information on the allocations within the background data can be found in the documentation of the Ecoinvent datasets.

## 3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data was collected for the 2024 operating year. The quantities of raw materials, consumables and supplies used and the energy consumption were recorded and averaged over the entire 2024 operating year. The reference area is Germany.

## 3.8 ESTIMATES AND ASSUMPTIONS

For the deconstruction of the product (module C1), the products are manually removed a few days after the concrete has fully cured. This process does not involve the use of fuel, and therefore, the environmental impact for the C1 (Demolition) module is considered negligible.

## 3.9 DATA QUALITY

Overall, the data quality can be classified as good. The dataset consists of primary data directly collected by BAG® Bauartikel GmbH. The specific production data for solar energy was recorded and provided by the company. All relevant process-specific data were successfully captured during the operational data collection phase.

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 Ecoinvent database (2019, version 3.6) was used. The 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.

The scenarios included are current and representative of one of the most likely scenario variants.

## 3.10 POWER MIX

In this EPD, the "market-based approach" was applied, utilizing the specific electricity mix provided by the electricity supplier, in compliance with local legislation, to conduct the LCA. Additionally, the site generated its own solar energy, with the energy distribution comprising 33.88% grid-mix electricity and 66.12% site-generated photovoltaic electricity.

The GWP-total of the applied electricity grid mix is 0.72512114 kg $CO_2$ eqv. per kWh, while the GWP-total of the applied photovoltaic electricity is 0.026674709 kg $CO_2$ eqv. per kWh.

# 3 Calculation rules

## 3.12 SCALING

The results presented in this EPD are based on a function approach and do not represent the final environmental impact. Instead, they provide a framework for scaling different material compositions within a defined range, incorporating both scalable and fixed part of results. The fixed part means that the numbers are the same for each product in the product group and the scalable part is the part that depends on the mass per unit length of the product.

The scaling was done on the basis of mass per meter. The values are derived using predefined functions that adjust the environmental impact based on variations in material inputs. The actual environmental impact of a given product will depend on the specific composition selected and will be interpreted within the boundaries of the applied assumptions and calculation models. In order to calculate the correct number of each environmental impact category for each of the products in the product group, the following calculation should be done:

[number fixed part]+([specific mass]*[number scalable part])

**These products are covered by this EPD:**

| Variation (diamater in mm) | **Unit weight (kg/m)** |
|---|---|
| 200x200 | 3.285 |
| 240x240 | 4.285 |
| 250x250 | 4.465 |
| 300x300 | 5.285 |
| 350x350 | 7.290 |
| 400x400 | 7.790 |
| 450x450 | 9.986 |
| 500x500 | 12.290 |
| 550x550 | 12.790 |
| 600x600 | 14.690 |

# 3 Calculation rules

| Parameter | Value |
|---|---|
| Scaling type | Linear |
| Description dimension | length |
| Dimension | 0.000 |
| Scalable dimension | 1.000 |
| Unit dimension | kg/m |

# 4 Scenarios and additional technical information

## 4.1 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

## 4.2 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] |
|---|---|---|---|---|---|---|
| plastics, via residue (NMD ID 43) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| wood 'clean', via residue (NMD ID 35) \| (u=10%) corr. acc. EN16449 | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 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 | 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 |

## 4.3 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 [%] |
|---|---|---|---|---|---|---|
| plastics, via residue (NMD ID 43) | NL | 0 | 20 | 80 | 0 | 0 |

# 4 Scenarios and additional technical information

| Waste Scenario | Region | Not removed (stays in work) [%] | Landfill [%] | Incineration [%] | Recycling [%] | Re-use [%] |
|---|---|---|---|---|---|---|
| wood 'clean', via residue (NMD ID 35) \| (u=10%) corr. acc. EN16449 | NL | 0 | 10 | 85 | 5 | 0 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) | NL | 0 | 10 | 85 | 5 | 0 |

| Waste Scenario | Not removed (stays in work) [kg] | Landfill [kg] | Incineration [kg] | Recycling [kg] | Re-use [kg] |
|---|---|---|---|---|---|
| plastics, via residue (NMD ID 43) | 0.000 | 0.130 | 0.519 | 0.000 | 0.000 |
| wood 'clean', via residue (NMD ID 35) \| (u=10%) corr. acc. EN16449 | 0.000 | 0.135 | 1.148 | 0.068 | 0.000 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) | 0.000 | 0.031 | 0.264 | 0.016 | 0.000 |
| **Total** | **0.000** | **0.296** | **1.931** | **0.083** | **0.000** |

## 4.4 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] |
|---|---|---|
| plastics, via residue (NMD ID 43) | 0.007 | 0.000 |
| wood 'clean', via residue (NMD ID 35) \| (u=10%) corr. acc. EN16449 | 0.068 | 15.260 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) | 0.016 | 8.554 |
| **Total** | **0.090** | **23.814** |

# 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 Results

## 5.1 ENVIRONMENTAL IMPACT INDICATORS PER METER (FIXED PART)

### CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$ eq. | -1.18E+0 | 2.08E-1 | 5.80E-1 | -3.93E-1 | 0.00E+0 | 4.52E-3 | -7.27E-2 | 1.55E-1 | -4.98E-1 |
| GWP-f | kg $CO_2$ eq. | 4.53E-1 | 2.08E-1 | 5.80E-1 | 1.24E+0 | 0.00E+0 | 4.51E-3 | -1.60E+0 | -2.22E-2 | -4.96E-1 |
| GWP-b | kg $CO_2$ eq. | -1.64E+0 | 9.59E-5 | 1.72E-4 | -1.64E+0 | 0.00E+0 | 2.08E-6 | 1.53E+0 | 1.77E-1 | -7.05E-4 |
| GWP-luluc | kg $CO_2$ eq. | 5.62E-3 | 7.62E-5 | 2.48E-4 | 5.95E-3 | 0.00E+0 | 1.65E-6 | -1.17E-4 | -4.17E-7 | -5.85E-4 |
| ODP | kg CFC 11 eq. | 2.81E-7 | 4.59E-8 | 1.45E-8 | 3.42E-7 | 0.00E+0 | 9.96E-10 | -4.72E-8 | -2.70E-10 | -6.21E-8 |
| AP | mol H+ eq. | 1.87E-2 | 1.21E-3 | 2.20E-3 | 2.21E-2 | 0.00E+0 | 2.62E-5 | -4.00E-4 | -7.86E-6 | -2.18E-3 |
| EP-fw | kg P eq. | 1.42E-4 | 2.10E-6 | 3.45E-5 | 1.78E-4 | 0.00E+0 | 4.55E-8 | -4.36E-6 | -4.90E-9 | -7.06E-6 |
| EP-m | kg N eq. | 2.52E-3 | 4.25E-4 | 3.94E-4 | 3.34E-3 | 0.00E+0 | 9.22E-6 | -5.80E-5 | -8.77E-6 | -5.98E-4 |
| EP-T | mol N eq. | 2.99E-2 | 4.68E-3 | 4.52E-3 | 3.91E-2 | 0.00E+0 | 1.02E-4 | -6.02E-4 | -2.97E-5 | -9.07E-3 |
| POCP | kg NMVOC eq. | -3.64E-2 | 1.34E-3 | 3.36E-5 | -3.51E-2 | 0.00E+0 | 2.90E-5 | -1.62E-4 | -1.12E-5 | -1.93E-3 |
| ADP-mm | kg Sb-eq. | 9.92E-5 | 5.27E-6 | 8.13E-6 | 1.13E-4 | 0.00E+0 | 1.14E-7 | -1.78E-6 | -1.99E-8 | -1.05E-6 |
| ADP-f | MJ | -3.74E+1 | 3.13E+0 | 7.96E+0 | -2.63E+1 | 0.00E+0 | 6.81E-2 | -9.68E-1 | -2.07E-2 | -8.83E+0 |
| WDP | m3 world eq. | 1.29E+0 | 1.12E-2 | 6.02E-2 | 1.36E+0 | 0.00E+0 | 2.44E-4 | -7.60E-2 | -8.31E-4 | -9.89E-2 |

**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 minerals&metals) | **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 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PM | disease incidence | 2.43E-7 | 1.87E-8 | 1.30E-8 | 2.74E-7 | 0.00E+0 | 4.06E-10 | -2.68E-9 | -1.50E-10 | -2.54E-8 |
| IR | kBq U235 eq. | 7.88E-2 | 1.31E-2 | 2.92E-2 | 1.21E-1 | 0.00E+0 | 2.85E-4 | -4.28E-3 | -8.12E-5 | -5.11E-3 |
| ETP-fw | CTUe | 4.80E+1 | 2.80E+0 | 2.01E+0 | 5.28E+1 | 0.00E+0 | 6.07E-2 | -2.00E+1 | -1.78E-1 | -1.58E+1 |
| HTP-c | CTUh | 2.41E-9 | 9.07E-11 | 2.30E-10 | 2.73E-9 | 0.00E+0 | 1.97E-12 | -3.37E-11 | -7.26E-13 | -2.16E-10 |
| HTP-nc | CTUh | 5.08E-8 | 3.06E-9 | 9.52E-9 | 6.34E-8 | 0.00E+0 | 6.64E-11 | -5.36E-9 | -3.15E-11 | -6.98E-9 |
| SQP | Pt | 2.11E+2 | 2.72E+0 | 7.06E+0 | 2.21E+2 | 0.00E+0 | 5.90E-2 | -2.69E-1 | -4.87E-2 | -6.25E+1 |

**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 ENVIRONMENTAL IMPACT INDICATORS PER METER (SCALABLE PART)

### CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$ eq. | 1.48E+0 | 1.11E-1 | 1.08E-1 | 1.70E+0 | 0.00E+0 | 1.86E-2 | 1.88E+0 | 7.53E-2 | 2.40E-2 |
| GWP-f | kg $CO_2$ eq. | 2.00E+0 | 1.11E-1 | 1.07E-1 | 2.22E+0 | 0.00E+0 | 1.86E-2 | 1.38E+0 | 1.70E-2 | 2.39E-2 |
| GWP-b | kg $CO_2$ eq. | -5.20E-1 | 5.12E-5 | 1.20E-3 | -5.19E-1 | 0.00E+0 | 8.57E-6 | 5.01E-1 | 5.83E-2 | 3.56E-4 |
| GWP-luluc | kg $CO_2$ eq. | 8.78E-4 | 4.06E-5 | 2.54E-5 | 9.44E-4 | 0.00E+0 | 6.80E-6 | 1.06E-4 | 8.94E-7 | -1.86E-4 |
| ODP | kg CFC 11 eq. | 1.28E-8 | 2.45E-8 | 2.39E-9 | 3.97E-8 | 0.00E+0 | 4.10E-9 | 4.19E-8 | 5.38E-10 | -4.30E-9 |
| AP | mol H+ eq. | 3.24E-3 | 6.43E-4 | 1.29E-4 | 4.01E-3 | 0.00E+0 | 1.08E-4 | 6.78E-4 | 1.53E-5 | -3.80E-4 |
| EP-fw | kg P eq. | 2.66E-6 | 1.12E-6 | 2.12E-7 | 3.99E-6 | 0.00E+0 | 1.87E-7 | 4.04E-6 | 3.55E-8 | -9.79E-7 |
| EP-m | kg N eq. | 9.12E-4 | 2.27E-4 | 3.78E-5 | 1.18E-3 | 0.00E+0 | 3.79E-5 | 2.02E-4 | 1.18E-5 | -1.31E-4 |

**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 minerals&metals) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

# 5 Results

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| EP-T | mol N eq. | 1.00E-2 | 2.50E-3 | 3.91E-4 | 1.29E-2 | 0.00E+0 | 4.18E-4 | 2.27E-3 | 5.56E-5 | -2.26E-3 |
| POCP | kg NMVOC eq. | 3.05E-2 | 7.13E-4 | 9.49E-4 | 3.21E-2 | 0.00E+0 | 1.19E-4 | 5.99E-4 | 2.04E-5 | -3.17E-4 |
| ADP-mm | kg Sb-eq. | 1.51E-6 | 2.81E-6 | 1.86E-7 | 4.50E-6 | 0.00E+0 | 4.70E-7 | 1.63E-6 | 1.53E-8 | -2.45E-7 |
| ADP-f | MJ | 5.82E+1 | 1.67E+0 | 1.86E+0 | 6.18E+1 | 0.00E+0 | 2.80E-1 | 9.79E-1 | 4.13E-2 | 6.92E-1 |
| WDP | m3 world eq. | 1.51E-1 | 5.98E-3 | 7.72E-3 | 1.65E-1 | 0.00E+0 | 1.00E-3 | 6.94E-2 | 1.78E-3 | 2.83E-2 |

**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 minerals&metals) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

**ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2**

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PM | disease incidence | 4.35E-8 | 9.97E-9 | 1.64E-9 | 5.51E-8 | 0.00E+0 | 1.67E-9 | 5.12E-9 | 2.85E-10 | -5.88E-9 |
| IR | kBq U235 eq. | 4.37E-2 | 7.01E-3 | 1.66E-3 | 5.24E-2 | 0.00E+0 | 1.17E-3 | 4.13E-3 | 1.62E-4 | -8.79E-4 |
| ETP-fw | CTUe | 3.47E+1 | 1.49E+0 | 1.47E+0 | 3.77E+1 | 0.00E+0 | 2.50E-1 | 1.74E+1 | 1.29E-1 | -4.97E+0 |
| HTP-c | CTUh | 7.18E-10 | 4.84E-11 | 3.18E-11 | 7.99E-10 | 0.00E+0 | 8.10E-12 | 3.36E-10 | 1.15E-12 | -5.08E-11 |
| HTP-nc | CTUh | 3.17E-8 | 1.63E-9 | 1.12E-9 | 3.45E-8 | 0.00E+0 | 2.73E-10 | 5.61E-9 | 4.68E-11 | -2.01E-9 |
| SQP | Pt | 6.54E+1 | 1.45E+0 | 1.41E+0 | 6.83E+1 | 0.00E+0 | 2.43E-1 | 3.01E-1 | 9.74E-2 | -2.05E+1 |

**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)

# 5 Results

**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 |
| | 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 Results

## 5.3 ENVIRONMENTAL IMPACT INDICATORS PER METER (FIXED PART)

### PARAMETERS DESCRIBING RESOURCE USE

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 1.44E+1 | 3.92E-2 | 5.92E-1 | 1.50E+1 | 0.00E+0 | 8.52E-4 | -1.13E-1 | -2.51E-5 | -1.29E+1 |
| PERM | MJ | 2.19E+1 | 0.00E+0 | 6.57E-1 | 2.26E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PERT | MJ | 3.63E+1 | 3.92E-2 | 1.25E+0 | 3.76E+1 | 0.00E+0 | 8.52E-4 | -1.13E-1 | -2.51E-5 | -1.29E+1 |
| PENRE | MJ | 6.92E+0 | 3.33E+0 | 9.78E+0 | 2.00E+1 | 0.00E+0 | 7.23E-2 | -1.03E+0 | -2.20E-2 | -8.66E+0 |
| PENRM | MJ | -4.00E+1 | 0.00E+0 | -1.23E+0 | -4.12E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -1.03E+0 |
| PENRT | MJ | -3.34E+1 | 3.33E+0 | 8.54E+0 | -2.15E+1 | 0.00E+0 | 7.23E-2 | -1.03E+0 | -2.20E-2 | -9.69E+0 |
| SM | Kg | -1.82E-2 | 0.00E+0 | -5.45E-4 | -1.87E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| RSF | 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 |
| NRSF | 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 |
| FW | $m^3$ | 2.95E-2 | 3.82E-4 | 6.67E-3 | 3.65E-2 | 0.00E+0 | 8.29E-6 | -1.90E-3 | -2.08E-5 | -1.95E-3 |

**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

### OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | Kg | 5.04E-4 | 7.94E-6 | 3.46E-5 | 5.47E-4 | 0.00E+0 | 1.73E-7 | -1.85E-6 | -4.96E-8 | -9.83E-6 |
| NHWD | Kg | 8.82E-1 | 1.99E-1 | 5.69E-2 | 1.14E+0 | 0.00E+0 | 4.32E-3 | -1.52E-2 | -8.51E-2 | -2.71E-2 |
| RWD | Kg | -3.39E-4 | 2.06E-5 | 2.56E-5 | -2.93E-4 | 0.00E+0 | 4.47E-7 | -3.45E-6 | -1.21E-7 | -7.29E-6 |

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

# 5 Results

### ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | 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 |
| MFR | Kg | 0.00E+0 | 0.00E+0 | 1.99E-3 | 1.99E-3 | 0.00E+0 | 0.00E+0 | 6.63E-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 |
| EET | MJ | 0.00E+0 | 0.00E+0 | -1.86E-1 | -1.86E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -6.21E+0 |
| EEE | MJ | 0.00E+0 | 0.00E+0 | -1.08E-1 | -1.08E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -3.61E+0 |

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

## 5.4 ENVIRONMENTAL IMPACT INDICATORS PER METER (SCALABLE PART)

### PARAMETERS DESCRIBING RESOURCE USE

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 8.30E+0 | 2.09E-2 | 1.26E-1 | 8.45E+0 | 0.00E+0 | 3.51E-3 | 1.05E-1 | 8.63E-4 | -4.22E+0 |
| PERM | MJ | 4.46E+0 | 0.00E+0 | 1.34E-1 | 4.60E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PERT | MJ | 1.28E+1 | 2.09E-2 | 2.60E-1 | 1.30E+1 | 0.00E+0 | 3.51E-3 | 1.05E-1 | 8.63E-4 | -4.22E+0 |
| PENRE | MJ | 3.33E+1 | 1.78E+0 | 1.11E+0 | 3.62E+1 | 0.00E+0 | 2.97E-1 | 1.04E+0 | 4.39E-2 | 3.99E-1 |
| PENRM | MJ | 2.48E+1 | 0.00E+0 | 7.55E-1 | 2.56E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 3.49E-1 |
| PENRT | MJ | 5.83E+1 | 1.78E+0 | 1.87E+0 | 6.19E+1 | 0.00E+0 | 2.97E-1 | 1.04E+0 | 4.39E-2 | 7.48E-1 |
| SM | Kg | 1.08E-2 | 0.00E+0 | 3.25E-4 | 1.12E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| RSF | 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 |
| NRSF | 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 |

**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

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| FW | $m^3$ | 8.57E-3 | 2.04E-4 | 3.49E-4 | 9.12E-3 | 0.00E+0 | 3.41E-5 | 2.16E-3 | 4.34E-5 | 6.43E-4 |

**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

## OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | Kg | 2.28E-6 | 4.24E-6 | 2.55E-7 | 6.78E-6 | 0.00E+0 | 7.10E-7 | 1.93E-6 | 5.67E-8 | -7.15E-7 |
| NHWD | Kg | 6.12E-2 | 1.06E-1 | 1.09E-2 | 1.78E-1 | 0.00E+0 | 1.78E-2 | 2.21E-2 | 1.64E-1 | -7.11E-3 |
| RWD | Kg | 2.94E-4 | 1.10E-5 | 9.27E-6 | 3.14E-4 | 0.00E+0 | 1.84E-6 | 3.49E-6 | 2.45E-7 | -1.30E-6 |

**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 | 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 |
| MFR | Kg | 0.00E+0 | 0.00E+0 | 5.01E-4 | 5.01E-4 | 0.00E+0 | 0.00E+0 | 1.67E-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 |
| EET | MJ | 0.00E+0 | 0.00E+0 | -3.51E-2 | -3.51E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -1.17E+0 |
| EEE | MJ | 0.00E+0 | 0.00E+0 | -2.04E-2 | -2.04E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -6.79E-1 |

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

# 5 Results

## 5.5 INFORMATION ON BIOGENIC CARBON CONTENT PER METER

### BIOGENIC CARBON CONTENT

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

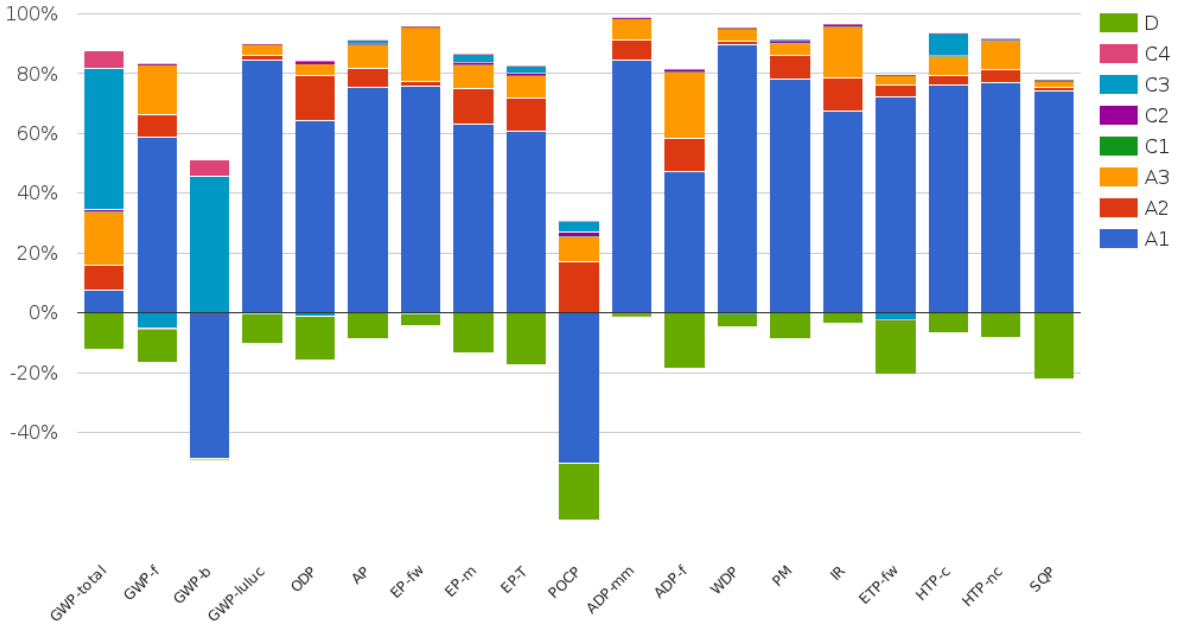
| Biogenic carbon content | Amount | Unit |
|---|---|---|
| Biogenic carbon content in the product | 0.5873 | kg C |
| Biogenic carbon content in accompanying packaging | 0 | kg C |

### UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

| Uptake Biogenic Carbon dioxide | Amount | Unit |
|---|---|---|
| product | 2.153 | kg CO2 (biogenic) |

# 6 Interpretation of results




For easier understanding, the results are presented graphically in order to be able to see correlations and connections between the data more clearly.

As can be seen in the graph, raw material provision (module A1) dominates in almost all environmental impact categories except in Global Warming Potential (GWP). Module C3 has the relative high influence on the total Global Warming Potential (GWP-total) and Global Warming Potential-biogenic (GWP-b).

# 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 14044:2006

**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 (2022-02-14)

**Environmental Performance Assessment Method for Construction Works Version 1.1**
Nationale Milieudatabase - Calculation method to determine environmental performance of construction works throughout their service life, based on EN 15804 (March 2022)

# 8 Contact information

| Publisher | Operator | Owner of declaration |
|---|---|---|

**Kiwa-Ecobility Experts**
Wattstraße 11-13
13355 Berlin, DE

**E-mail:**
DE.Ecobility.Experts@kiwa.com
**Website:**
https://www.kiwa.com/de/en/themes/ecobility-experts/ecobility-experts-epd-program/

**Kiwa-Ecobility Experts**
Wattstraße 11-13
13355 Berlin, DE

**E-mail:**
DE.Ecobility.Experts@kiwa.com
**Website:**
https://www.kiwa.com/de/en/themes/ecobility-experts/ecobility-experts-epd-program/

**BAG® Bauartikel GmbH**
Zotzenheimer Straße 64a
55576 Sprendlingen, Germany, DE

**E-mail:**
zentrale@bagbauartikel.com
**Website:**
https://www.bagbauartikel.info/

Kiwa-Ecobility Experts is established member of the ECO PLATFORM