



# ENVIRONMENTAL PRODUCT DECLARATION

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

Sunbell 2.0

BRIGHT Products



## EPD HUB, HUB-3407

Published on 30.05.2025, last updated on 30.05.2025, valid until 29.05.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (5 Dec 2023) and JRC characterization factors EF 3.1.



Created with One Click LCA



## GENERAL INFORMATION

### MANUFACTURER

|                 |                                                                         |
|-----------------|-------------------------------------------------------------------------|
| Manufacturer    | BRIGHT Products                                                         |
| Address         | Holbergs gate 19, Oslo, Norway                                          |
| Contact details | info@bright-products.com                                                |
| Website         | <a href="https://bright-products.com/">https://bright-products.com/</a> |

### EPD STANDARDS, SCOPE AND VERIFICATION

|                    |                                                                                                                                                                                    |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Program operator   | EPD Hub, hub@epdhub.com                                                                                                                                                            |
| Reference standard | EN 15804+A2:2019 and ISO 14025                                                                                                                                                     |
| PCR                | EPD Hub Core PCR Version 1.1, 5 Dec 2023                                                                                                                                           |
| Sector             | Electrical product                                                                                                                                                                 |
| Category of EPD    | Third party verified EPD                                                                                                                                                           |
| Scope of the EPD   | Cradle to gate with options, A4-A5, and modules C1-C4, D                                                                                                                           |
| EPD author         | Fernando Manuel Barrios Acuna, BRIGHT Products AS                                                                                                                                  |
| EPD verification   | Independent verification of this EPD and data, according to ISO 14025:<br><input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification |
| EPD verifier       | Sarah Curpen, as an authorized verifier acting for EPD Hub Limited.                                                                                                                |

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

### PRODUCT

|                                            |                               |
|--------------------------------------------|-------------------------------|
| Product name                               | Sunbell 2.0                   |
| Additional labels                          | -                             |
| Product reference                          | -                             |
| Place(s) of raw material origin            | -                             |
| Place of production                        | Xiamen, China                 |
| Place(s) of installation and use           | -                             |
| Period for data                            | January 2023 to December 2023 |
| Averaging in EPD                           | No averaging                  |
| Variation in GWP-fossil for A1-A3 (%)      | -                             |
| GTIN (Global Trade Item Number)            | -                             |
| NOBB (Norwegian Building Product Database) | -                             |

### ENVIRONMENTAL DATA SUMMARY

|                                             |                         |
|---------------------------------------------|-------------------------|
| Declared unit                               | 1 unit of a Sunbell 2.0 |
| Declared unit mass                          | 0,447 kg                |
| GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)     | 3,53E+00                |
| GWP-total, A1-A3 (kgCO <sub>2</sub> e)      | 3,16E+00                |
| Secondary material, inputs (%)              | 50,8                    |
| Secondary material, outputs (%)             | 0                       |
| Total energy use, A1-A3 (kWh)               | 12,1                    |
| Net freshwater use, A1-A3 (m <sup>3</sup> ) | 0,08                    |

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

#### About BRIGHT Products

BRIGHT Products is a Norwegian company dedicated to developing sustainable solar lighting and energy solutions. With a strong focus on social impact, BRIGHT creates high-quality, user-friendly solar products that enhance everyday life in off-grid and energy-insecure areas. The company follows a sustainable design philosophy, ensuring that its products are durable, repairable, and environmentally responsible.

#### Manufacturing & Assembly

The Sunbell is produced through a global supply chain. The individual components, including the solar panel, battery, and LED module, are sourced from specialized suppliers. Final assembly takes place in Xiamen, China, where the parts are put together into the finished product. No manufacturing of components occurs at the assembly facility—only integration and quality control.

### PRODUCT DESCRIPTION

The SunBell lamp is not just a solar-powered light, it's a versatile companion designed to meet your needs in off-grid conditions and during emergencies, whether you're indoors or outdoors. It can be your lantern, reading light, hanging light, or hands-free neck light. With its robust, modular design, the SunBell lamp is ready to adapt to your needs, providing light when you need it most.

As of today, the lamp has been placed ONLY in REFUGEE CAMPS where there is NO access to the grid.

Some parts of the lamp are made from 100% recycled plastic, reinforcing BRIGHT's commitment to sustainability. It is lightweight, easy to use, and designed for long-term reliability with simple maintenance and repairability.

Further information can be found at <https://bright-products.com/>.

### PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|-----------------------|----------------|-----------------|
| Metals                | 14,04          | China           |
| Minerals              | 9,37           | China           |
| Fossil materials      | 67,28          | China           |
| Electronics           | 9,31           | China           |

### BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

|                                            |        |
|--------------------------------------------|--------|
| Biogenic carbon content in product, kg C   | 0      |
| Biogenic carbon content in packaging, kg C | 0,0915 |

## FUNCTIONAL UNIT AND SERVICE LIFE

|                        |                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Declared unit          | 1 unit of a Sunbell 2.0                                                                                                 |
| Mass per declared unit | 0,447 kg                                                                                                                |
| Functional unit        | Provide lighting that delivers an outgoing artificial luminous flux of 20 lumens during a reference lifetime of 5 years |
| Reference service life | 5 years                                                                                                                 |

## SUBSTANCES, REACH - VERY HIGH CONCERN

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



# PRODUCT LIFE-CYCLE

## SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

| Product stage |           |               | Assembly stage |          | Use stage |             |        |             |               |                        |                       | End of life stage          |           |                  |          | Beyond the system boundaries |          |           |
|---------------|-----------|---------------|----------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------|----------|-----------|
| A1            | A2        | A3            | A4             | A5       | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                            |          |           |
| x             | x         | x             | x              | x        | MND       | MND         | MND    | MND         | MND           | MND                    | MND                   | x                          | x         | x                | x        | x                            |          |           |
| Raw materials | Transport | Manufacturing | Transport      | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction/ demolition | Transport | Waste processing | Disposal | Reuse                        | Recovery | Recycling |

Modules not declared = MND. Modules not relevant = MNR

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The product is made of metals, plastics and electronic components. The materials are transported to the company's facility, where the pieces are

assembled together. All pieces are purchase as is from different suppliers. The finished product is packaged in recycled cardboard before being sent to a potential refugee camp or disaster affected area.

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Average distance of transportation from assembly plant to a refugee camp or disaster affected area is assumed as 9500 km and the transportation method is assumed to be freight sea followed by train (85 km) and road transportation of approximately 50 km. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. It may vary but as the role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not considered as it is assumed that a return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 100 % for the nested packaged products. Transportation impacts that occur from delivery of the product cover direct exhaust emissions of fuel, environmental impacts of fuel production, as well as related infrastructure emissions. Environmental impacts from installation into the building include waste packaging materials (A5) and release of biogenic carbon dioxide from cardboard. The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

## PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

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

### PRODUCT END OF LIFE (C1-C4, D)

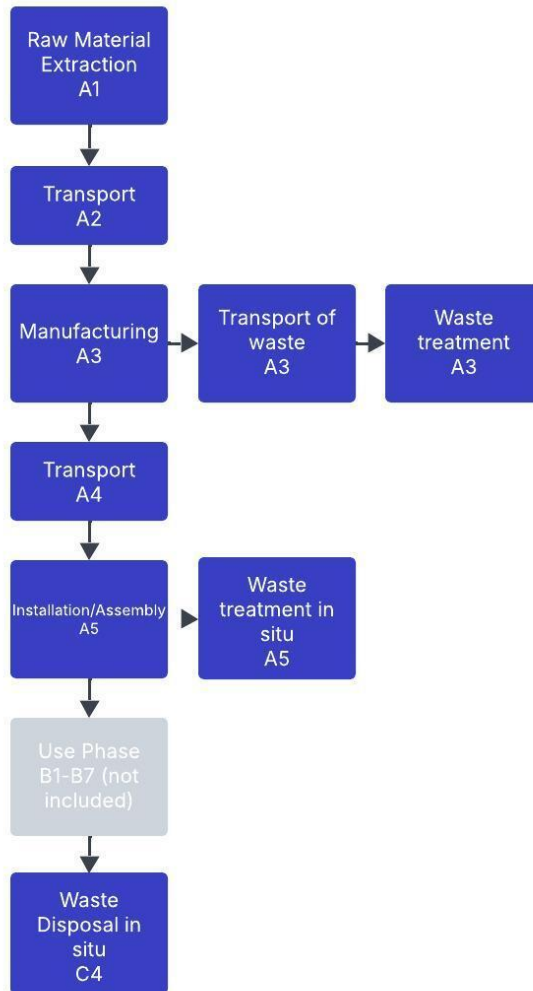
Predicting the exact end-of-life scenario for a portable solar lamp distributed to refugee camps is challenging due to various factors, including potential displacement and the informal nature of waste management in these regions.

For this LCA, we have made a conservative assumption that the majority of these lamps will eventually end up incinerated locally. Considering the limited infrastructure and waste management practices in many refugee camps, we have assumed that the lamps will be incinerated locally at the refugee camp.

Given the precarious conditions of these incineration facilities, it is unlikely that any heat recovery or energy recovery systems are in place. Therefore, the incineration process is assumed to release all pollutants directly into the environment.

This assumption provides a worst-case scenario for the end-of-life phase of the product and allows for a conservative assessment of its overall environmental impact.

## MANUFACTURING PROCESS



## LIFE-CYCLE ASSESSMENT

### CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

### VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC2021 and JRC EF 3.1.

### ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

| Data type                      | Allocation                  |
|--------------------------------|-----------------------------|
| Raw materials                  | No allocation               |
| Packaging material             | No allocation               |
| Ancillary materials            | Not applicable              |
| Manufacturing energy and waste | Allocated by mass or volume |

### AVERAGES AND VARIABILITY

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

There is no average result considered in this study since this EPD refers to one specific product produced in one production plant.

### LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.



# ENVIRONMENTAL IMPACT DATA

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category                     | Unit                   | A1       | A2       | A3        | A1-A3     | A4       | A5       | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4       | D        |
|-------------------------------------|------------------------|----------|----------|-----------|-----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|----------|
| GWP – total <sup>1)</sup>           | kg CO <sub>2</sub> e   | 3,30E+00 | 1,45E-02 | -1,51E-01 | 3,16E+00  | 5,32E-02 | 3,79E-01 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,13E+00 | 0,00E+00 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 3,29E+00 | 1,45E-02 | 2,16E-01  | 3,53E+00  | 5,32E-02 | 7,08E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,12E+00 | 0,00E+00 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | 0,00E+00 | 0,00E+00 | -3,72E-01 | -3,72E-01 | 0,00E+00 | 3,72E-01 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 4,83E-03 | 6,47E-06 | 4,37E-03  | 9,21E-03  | 3,39E-05 | 1,04E-06 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,70E-04 | 0,00E+00 |
| Ozone depletion pot.                | kg CFC-11e             | 2,97E-07 | 2,13E-10 | 1,94E-09  | 2,99E-07  | 7,56E-10 | 4,63E-11 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,75E-08 | 0,00E+00 |
| Acidification potential             | mol H <sup>+</sup> e   | 4,64E-02 | 4,93E-05 | 1,11E-03  | 4,76E-02  | 1,22E-03 | 2,08E-04 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,56E-03 | 0,00E+00 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 2,62E-03 | 1,13E-06 | 1,06E-04  | 2,73E-03  | 2,37E-06 | 1,04E-06 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,07E-04 | 0,00E+00 |
| EP-marine                           | kg Ne                  | 4,38E-03 | 1,62E-05 | 5,82E-04  | 4,97E-03  | 2,85E-04 | 1,05E-04 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,66E-04 | 0,00E+00 |
| EP-terrestrial                      | mol Ne                 | 9,53E-02 | 1,76E-04 | 3,09E-03  | 9,86E-02  | 3,17E-03 | 1,12E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,61E-03 | 0,00E+00 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 1,49E-02 | 7,27E-05 | 8,72E-04  | 1,59E-02  | 8,91E-04 | 5,19E-04 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,33E-03 | 0,00E+00 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 3,25E-04 | 4,04E-08 | 5,39E-07  | 3,26E-04  | 7,47E-08 | 9,25E-09 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,94E-06 | 0,00E+00 |
| ADP-fossil resources                | MJ                     | 4,48E+01 | 2,10E-01 | 2,66E+00  | 4,77E+01  | 6,65E-01 | 2,43E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,38E+00 | 0,00E+00 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 3,10E+00 | 1,04E-03 | 8,76E-02  | 3,19E+00  | 2,41E-03 | 1,04E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,83E-02 | 0,00E+00 |

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category                  | Unit          | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4       | D        |
|----------------------------------|---------------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|----------|
| Particulate matter               | Incidence     | 3,13E-07 | 1,45E-09 | 1,80E-08 | 3,33E-07 | 2,16E-09 | 3,61E-10 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,76E-08 | 0,00E+00 |
| Ionizing radiation <sup>6)</sup> | kBq<br>11235e | 2,36E-01 | 1,83E-04 | 1,38E-02 | 2,50E-01 | 4,09E-04 | 4,64E-05 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,38E-02 | 0,00E+00 |
| Ecotoxicity (freshwater)         | CTUe          | 4,24E+01 | 2,97E-02 | 1,17E+00 | 4,36E+01 | 6,19E-02 | 2,27E-01 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,60E+01 | 0,00E+00 |
| Human toxicity, cancer           | CTUh          | 3,52E-09 | 2,39E-12 | 3,14E-10 | 3,84E-09 | 1,16E-11 | 1,23E-10 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,23E-09 | 0,00E+00 |
| Human tox. non-cancer            | CTUh          | 2,44E-07 | 1,36E-10 | 1,31E-09 | 2,45E-07 | 2,10E-10 | 3,45E-09 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,81E-09 | 0,00E+00 |
| SQP <sup>7)</sup>                | -             | 1,75E+01 | 2,11E-01 | 2,63E+01 | 4,40E+01 | 1,48E-01 | 7,36E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,04E-01 | 0,00E+00 |

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

## USE OF NATURAL RESOURCES

| Impact category                    | Unit           | A1       | A2       | A3        | A1-A3    | A4       | A5        | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4        | D        |
|------------------------------------|----------------|----------|----------|-----------|----------|----------|-----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|-----------|----------|
| Renew. PER as energy <sup>8)</sup> | MJ             | 6,60E+00 | 2,88E-03 | -3,27E-01 | 6,28E+00 | 6,95E-03 | -3,44E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,24E-01  | 0,00E+00 |
| Renew. PER as material             | MJ             | 0,00E+00 | 0,00E+00 | 3,70E+00  | 3,70E+00 | 0,00E+00 | -3,70E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 |
| Total use of renew. PER            | MJ             | 6,60E+00 | 2,88E-03 | 3,37E+00  | 9,98E+00 | 6,95E-03 | -7,14E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,24E-01  | 0,00E+00 |
| Non-re. PER as energy              | MJ             | 3,46E+01 | 2,10E-01 | 2,57E+00  | 3,73E+01 | 6,65E-01 | 2,43E-02  | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | -2,22E+00 | 0,00E+00 |
| Non-re. PER as material            | MJ             | 1,03E+01 | 0,00E+00 | 1,15E-01  | 1,04E+01 | 0,00E+00 | -1,15E-01 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | -1,03E+01 | 0,00E+00 |
| Total use of non-re. PER           | MJ             | 4,48E+01 | 2,10E-01 | 2,69E+00  | 4,77E+01 | 6,65E-01 | -9,10E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | -1,25E+01 | 0,00E+00 |
| Secondary materials                | kg             | 2,27E-01 | 8,93E-05 | 1,36E-01  | 3,63E-01 | 3,82E-04 | 3,57E-05  | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,54E-03  | 0,00E+00 |
| Renew. secondary fuels             | MJ             | 3,60E-03 | 1,13E-06 | 5,88E-02  | 6,24E-02 | 1,25E-06 | 5,86E-07  | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,69E-05  | 0,00E+00 |
| Non-ren. secondary fuels           | MJ             | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 | 0,00E+00 | 0,00E+00  | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 |
| Use of net fresh water             | m <sup>3</sup> | 7,67E-02 | 3,10E-05 | 1,92E-03  | 7,86E-02 | 6,01E-05 | 1,19E-04  | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,53E-03  | 0,00E+00 |

8) PER = Primary energy resources.



## END OF LIFE – WASTE

| Impact category     | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4       | D        |
|---------------------|------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|----------|
| Hazardous waste     | kg   | 6,55E-01 | 3,56E-04 | 1,98E-02 | 6,75E-01 | 1,11E-03 | 1,95E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,03E-01 | 0,00E+00 |
| Non-hazardous waste | kg   | 1,22E+01 | 6,58E-03 | 3,39E-01 | 1,25E+01 | 1,58E-02 | 2,24E-01 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,05E-01 | 0,00E+00 |
| Radioactive waste   | kg   | 5,89E-05 | 4,47E-08 | 3,39E-06 | 6,23E-05 | 1,00E-07 | 1,18E-08 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,60E-06 | 0,00E+00 |

## END OF LIFE – OUTPUT FLOWS

| Impact category               | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4       | D        |
|-------------------------------|------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|----------|
| Components for re-use         | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling       | kg   | 0,00E+00 | 0,00E+00 | 2,00E-02 | 2,00E-02 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec      | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 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 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy – Electricity | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy – Heat        | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

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

| Impact category      | Unit                               | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4       | D        |
|----------------------|------------------------------------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|----------|
| Global Warming Pot.  | kg CO <sub>2</sub> e               | 3,29E+00 | 1,44E-02 | 2,39E-01 | 3,55E+00 | 5,30E-02 | 2,60E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,12E+00 | 0,00E+00 |
| Ozone depletion Pot. | kg CFC-11e                         | 2,39E-07 | 1,70E-10 | 1,65E-09 | 2,41E-07 | 6,01E-10 | 4,16E-11 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,67E-08 | 0,00E+00 |
| Acidification        | kg SO <sub>2</sub> e               | 3,59E-02 | 3,77E-05 | 8,66E-04 | 3,68E-02 | 9,84E-04 | 1,44E-04 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,27E-03 | 0,00E+00 |
| Eutrophication       | kg PO <sub>4</sub> <sup>3</sup> e  | 9,08E-03 | 9,17E-06 | 1,65E-03 | 1,07E-02 | 1,04E-04 | 7,96E-05 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,32E-04 | 0,00E+00 |
| POCP (“smog”)        | kg C <sub>2</sub> H <sub>4</sub> e | 1,60E-03 | 3,36E-06 | 7,44E-05 | 1,67E-03 | 4,96E-05 | 2,79E-04 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,48E-05 | 0,00E+00 |
| ADP-elements         | kg Sbe                             | 3,24E-04 | 3,94E-08 | 5,49E-07 | 3,24E-04 | 7,36E-08 | 6,34E-09 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,53E-06 | 0,00E+00 |
| ADP-fossil           | MJ                                 | 4,09E+01 | 2,07E-01 | 2,42E+00 | 4,35E+01 | 6,58E-01 | 2,36E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,16E+00 | 0,00E+00 |



## ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

| Impact category       | Unit                 | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1  | B2  | B3  | B4  | B5  | B6  | B7  | C1       | C2       | C3       | C4       | D        |
|-----------------------|----------------------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|----------|
| GWP-GHG <sup>9)</sup> | kg CO <sub>2</sub> e | 3,30E+00 | 1,45E-02 | 2,21E-01 | 3,53E+00 | 5,32E-02 | 7,09E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,13E+00 | 0,00E+00 |

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH<sub>4</sub> fossil, CH<sub>4</sub> biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO<sub>2</sub> is set to zero.

## VERIFICATION STATEMENT

### VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliance with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

### THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Sarah Curpen, as an authorized verifier acting for EPD Hub Limited.  
30.05.2025

