

# ENVIRONMENTAL PRODUCT DECLARATION


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

Ready-mix concrete C30/37 XC4 XF2 D22 S4 Ae  
Steypustöðin ehf



**EPD HUB, HUB-0888**

Publishing date 24 November 2023, last updated date 24 November 2023, valid until 24 November 2028

One Click  Created with One Click LCA

## GENERAL INFORMATION

### MANUFACTURER

|                 |                                       |
|-----------------|---------------------------------------|
| Manufacturer    | Steypustöðin ehf                      |
| Address         | Malarhöfði 10, 110 Reykjavík, Iceland |
| Contact details | kai@steypustodin.is                   |
| Website         | www.steypustodin.is                   |

### 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 1.0, 1 Feb 2022<br>EN 16757 Product Category Rules for concrete and concrete elements  |
| Sector             | Construction product  |
| Category of EPD    | Third party verified EPD  |
| Scope of the EPD   | Cradle to gate with options, A4, and modules C1-C4, D   |
| EPD author         | Anna Ingvarsdóttir, Hera Harðardóttir - Verkís  |
| EPD verification   | Independent verification of this EPD and data, according to ISO 14025:<br><input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification |
| EPD verifier       | Sergio Ballen Zamora, as an authorized verifier acting for EPD Hub Limited  |

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                      | Ready-mix concrete C30/37 XC4 XF2 D22 S4 Ae |
| Additional labels                 |   |
| Product reference                 | 05302714                                    |
| Place of production               | Capital area, Iceland                       |
| Period for data                   | 2022  |
| Averaging in EPD                  | No averaging                                |
| Variation in GWP-fossil for A1-A3 | Not applicable                              |

### ENVIRONMENTAL DATA SUMMARY

|  |   |
|--|---|
| <b>Declared unit</b>                           | 1 cubic meter (m <sup>3</sup> ) of ready-mix concrete |
| <b>Declared unit mass</b>                      | 2331 kg   |
| <b>GWP-fossil, A1-A3 (kgCO<sub>2</sub>e)</b>   | 2,53E+02  |
| <b>GWP-total, A1-A3 (kgCO<sub>2</sub>e)</b>    | 2,54E+02  |
| <b>Secondary material, inputs (%)</b>          | 8,83E-04  |
| <b>Secondary material, outputs (%)</b>         | 8,0E+01   |
| <b>Total energy use, A1-A3 (kWh)</b>           | 3,53E+02  |
| <b>Total water use, A1-A3 (m<sup>3</sup>e)</b> | 5,28E-01  |

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

Production of ready-mix concrete is the main operation of Steypustöödin, where great emphasis is placed on quality issues and all additives and fillers used in the concrete are in accordance with the requirements of building regulations.

### PRODUCT DESCRIPTION

The product is a ready-mix concrete made out of cement, aggregates, admixtures and water mixed in a central batch plant. The product is loaded into ready mix trucks and delivered to construction site.

Further information can be found at [www.steypustodin.is](http://www.steypustodin.is).

### PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass- % | Material origin |
|-----------------------|-----------------|-----------------|
| Metals                | 0               | -               |
| Minerals              | 100             | -               |
| Fossil materials      | 0               | -               |
| Bio-based materials   | 0               | -               |

### 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

### FUNCTIONAL UNIT AND SERVICE LIFE

|                        |   |
|------------------------|---|
| Declared unit          | 1 cubic meter (m <sup>3</sup> ) of ready-mix concrete |
| Mass per declared unit | 2331 kg   |
| Functional unit        | -   |
| Reference service life | -   |

### 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              | MND      | 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 | Deconstr./demol.  | Transport | Waste processing | Disposal | Reuse                        | Recovery | Recycling |

Modules not declared = MND. Modules not relevant = MNR.

## MANUFACTURING AND PACKAGING (A1-A3)

For the product stage the environmental impact considered all materials in relation to raw material and relevant ancillary. This stage also covers the handling of waste generated during production at the manufacturing facilities and the fuels used by machinery. Handling of waste formed during the manufacturing processes is considered in (A1-A3).

The ready-mix concrete is made of cement, aggregates, admixtures, and water. Most of the concrete aggregate comes from Bakki quarry and Vatnsskarð quarry. Vatnsskarð is the largest production site of aggregates for Steypustöðin. The cement is imported from Aalborg Portland A/S. The concrete constituent materials such as aggregates, cement, additives, admixtures, and water are weighed and mixed in a central batching plant at Steypustöðin. When the product is ready after mixing it is loaded to a ready-mix concrete truck and transported to construction site.

Waste is collected at the manufacturing site and delivered to a recycling facility 15 kilometres away. Ancillary materials other than lubricant oil for

machinery is negligible. Process water from cleaning mixing equipment and trucks is reclaimed and re-used in concrete production, spillage goes to the wastewater sewage system. The energy source for manufacturing is electricity from the national grid and diesel fuel for machinery and vehicles. There are no direct emissions from the manufacturing process other than combustion of fuel.

## TRANSPORT AND INSTALLATION (A4-A5)

The product is loaded into a ready-mix concrete truck and delivered to the construction site (A4). The environmental impacts cover fuel consumption in direct exhaust emissions, the environmental impact of fuel production, as well as other related impacts from infrastructure. The average distance from production to the building site is assumed to be 18 km. The capacity utilization volume factor of the ready-mix concrete truck is assumed to be 100%.

At construction site the product is conveyed by concrete pumps or concrete buckets and cranes into the formwork. The product is suitable for structures with or without reinforcement steel. It can be used in residential or civil structures. Installation (A5) is not covered in the EPD according to standards and applied PCR.

## PRODUCT USE AND MAINTENANCE (B1-B7)

This environmental product declarations (EDP) do not include product use and maintenance (B1-B7).

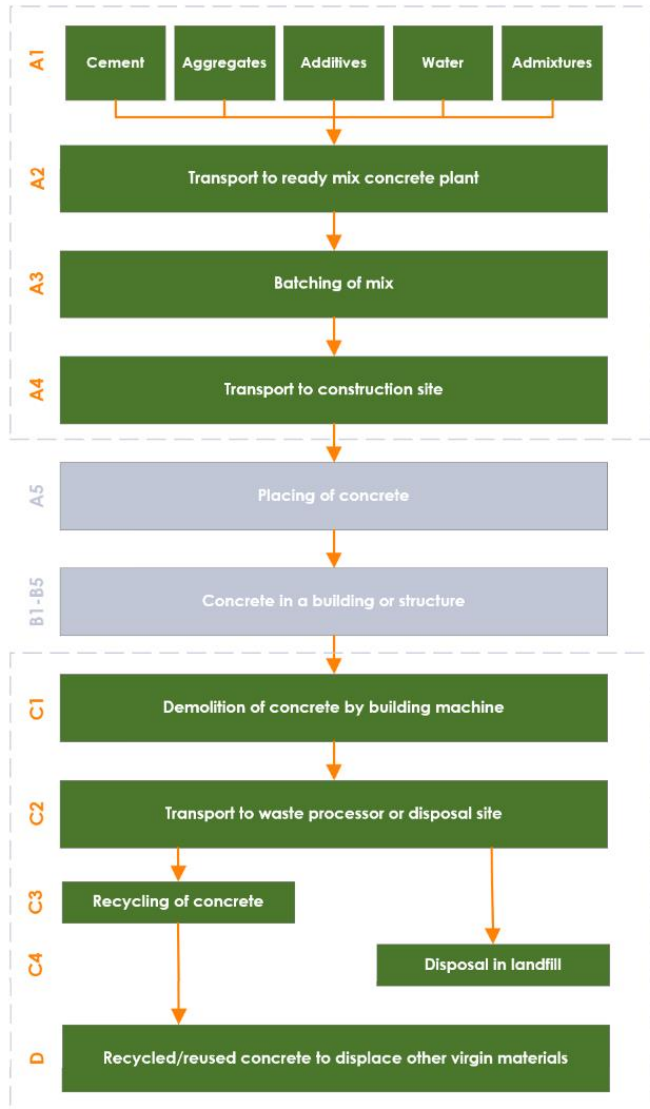
Air, soil, and water impacts during the use phase have not been studied.

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

At the end-of-life, in the demolition phase, 100% of the waste is assumed to be collected and there is no mass loss during the use of the product. It is assumed that 80% of the concrete is re-used at Bolöldur.

- **C1:** The energy consumption of a demolition process is on average 10 kWh/m<sup>2</sup> (Seçer & Bozdağ, 2007). The average mass of reinforced concrete material after demolition in Iceland is about 1293 kg/m<sup>2</sup> (Sigurbjörnsdóttir & Svavarsson, 2019). As a result, it is assumed that the energy used by the building machines during demolition is 0,008 kWh/kg of concrete element. The source of energy is diesel fuel used by work machines.
- **C2:** It is estimated that the transportation distances are 25 km to the nearest disposal landfill and 35 km to Bolaöldur for re-use. Lorry is the most common form of transportation.
- **C3:** At the end-of-life approximately 80% of the concrete is re-used (Betoniteollisusur ry, 2020) at Bolaöldur (where concrete waste is used for reclamation of land in older mines) (Sigurbjörnsdóttir & Brynjarsson, 2021). The process losses of the waste treatment plant are assumed to be negligible. The reinforced concrete is treated before it is transported to Bolaöldur by trimming the concrete units, which involves cleaning the plastic and other materials and cutting away any protruding concrete rebar.
- **C4:** The remaining 20% of concrete that is not fit for re-use at Bolaöldur is assumed to be sent to nearest landfill.
- **D:** The benefits and loads of concrete re-use are included and the re-used materials displace the need for virgin material production.

# 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.

## 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                  | Allocated by mass or volume |
| Packaging materials            | Not applicable              |
| Ancillary materials            | No allocation               |
| 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 | Not applicable |

This EPD is product and factory specific and does not contain average calculations.

## 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. Ecoinvent and One Click LCA databases were used as sources of environmental data.

# 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   | 2,38E+02 | 1,25E+01 | 3,26E+00  | 2,54E+02  | 3,66E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 5,94E+00 | 7,00E+00 | 1,05E+01 | 2,46E+00 | -1,45E+00 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 2,38E+02 | 1,25E+01 | 2,36E+00  | 2,53E+02  | 3,65E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 5,93E+00 | 6,99E+00 | 1,05E+01 | 2,45E+00 | -1,45E+00 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | 3,60E-01 | 3,32E-03 | 9,02E-01  | 1,27E+00  | 2,77E-03 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,65E-03 | 5,08E-03 | 2,91E-03 | 4,87E-03 | -5,31E-04 |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 1,42E-01 | 6,55E-03 | 4,44E-04  | 1,49E-01  | 1,15E-03 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 5,01E-04 | 2,10E-03 | 8,83E-04 | 7,29E-04 | -1,94E-04 |
| Ozone depletion pot.                | kg CFC-11e             | 5,51E-06 | 2,84E-06 | 4,54E-07  | 8,81E-06  | 8,97E-07 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,28E-06 | 1,64E-06 | 2,26E-06 | 1,01E-06 | -3,00E-07 |
| Acidification potential             | mol H <sup>+</sup> e   | 7,17E-01 | 1,69E-01 | 2,15E-02  | 9,07E-01  | 1,18E-02 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 6,21E-02 | 2,94E-02 | 1,09E-01 | 2,33E-02 | -1,51E-02 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 3,01E-03 | 8,96E-05 | 3,61E-05  | 3,13E-03  | 3,10E-05 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 2,40E-05 | 5,69E-05 | 4,23E-05 | 2,97E-05 | 0,00E+00  |
| EP-marine                           | kg Ne                  | 1,28E-01 | 3,79E-02 | 1,07E-02  | 1,76E-01  | 2,58E-03 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 2,74E-02 | 8,85E-03 | 4,83E-02 | 8,02E-03 | -6,56E-03 |
| EP-terrestrial                      | mol Ne                 | 1,39E+00 | 4,22E-01 | 9,98E-02  | 1,92E+00  | 2,87E-02 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 3,01E-01 | 9,77E-02 | 5,29E-01 | 8,84E-02 | -7,31E-02 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 4,47E-01 | 1,19E-01 | 2,78E-02  | 5,94E-01  | 1,13E-02 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,27E-02 | 3,14E-02 | 1,46E-01 | 2,57E-02 | -2,07E-02 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 6,26E-04 | 1,80E-04 | 1,40E-05  | 8,20E-04  | 6,51E-05 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 9,06E-06 | 1,19E-04 | 1,60E-05 | 2,24E-05 | -3,62E-06 |
| ADP-fossil resources                | MJ                     | 8,06E+02 | 1,86E+02 | 3,11E+01  | 1,02E+03  | 5,94E+01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,17E+01 | 1,09E+02 | 1,44E+02 | 6,86E+01 | -2,09E+01 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 1,13E+01 | 6,16E-01 | -2,04E+01 | -8,55E+00 | 2,21E-01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,52E-01 | 4,05E-01 | 2,68E-01 | 3,17E+00 | -6,08E-01 |

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 | 8,19E-06 | 8,15E-07 | 5,44E-07 | 9,55E-06 | 3,21E-07 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,65E-06 | 6,32E-07 | 1,03E-05 | 4,53E-07 | -3,94E-07 |
| Ionizing radiation <sup>6)</sup> | kBq U235e | 1,69E+00 | 8,07E-01 | 1,30E-01 | 2,63E+00 | 2,59E-01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 3,50E-01 | 4,75E-01 | 6,16E-01 | 2,82E-01 | -8,54E-02 |
| Ecotoxicity (freshwater)         | CTUe      | 2,11E+03 | 1,35E+02 | 4,08E+01 | 2,29E+03 | 4,54E+01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 4,79E+01 | 8,31E+01 | 8,44E+01 | 4,33E+01 | -1,32E+01 |
| Human toxicity, cancer           | CTUh      | 1,71E-07 | 5,60E-09 | 2,24E-09 | 1,79E-07 | 1,14E-09 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,72E-09 | 2,13E-09 | 3,02E-09 | 1,03E-09 | -5,82E-10 |
| Human tox. non-cancer            | CTUh      | 8,49E-07 | 1,42E-07 | 3,06E-08 | 1,02E-06 | 5,18E-08 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 4,23E-08 | 9,85E-08 | 7,44E-08 | 3,16E-08 | -1,31E-08 |
| SQP <sup>7)</sup>                | -         | 1,80E+02 | 1,87E+02 | 5,57E+00 | 3,72E+02 | 8,96E+01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 2,10E+00 | 1,64E+02 | 3,69E+00 | 1,17E+02 | -5,82E-01 |

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             | 1,65E+02 | 2,04E+00 | 1,14E+01 | 1,78E+02 | 7,47E-01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 4,42E-01 | 1,37E+00 | 7,78E-01 | 5,55E-01 | -1,43E-01 |
| Renew. PER as material             | MJ             | 4,93E-01 | 0,00E+00 | 0,00E+00 | 4,93E-01 | 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  |
| Total use of renew. PER            | MJ             | 1,65E+02 | 2,04E+00 | 1,14E+01 | 1,79E+02 | 7,47E-01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 4,42E-01 | 1,37E+00 | 7,78E-01 | 5,55E-01 | -1,43E-01 |
| Non-re. PER as energy              | MJ             | 8,76E+02 | 1,86E+02 | 3,11E+01 | 1,09E+03 | 5,94E+01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,17E+01 | 1,09E+02 | 1,44E+02 | 6,86E+01 | -2,09E+01 |
| Non-re. PER as material            | MJ             | 1,57E+01 | 0,00E+00 | 0,00E+00 | 1,57E+01 | 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  |
| Total use of non-re. PER           | MJ             | 8,91E+02 | 1,86E+02 | 3,11E+01 | 1,11E+03 | 5,94E+01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,17E+01 | 1,09E+02 | 1,44E+02 | 6,86E+01 | -2,09E+01 |
| Secondary materials                | kg             | 2,06E-02 | 0,00E+00 | 1,27E-04 | 2,07E-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 | -4,48E-03 |
| Renew. 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  |
| 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> | 4,26E-01 | 3,20E-02 | 7,00E-02 | 5,28E-01 | 1,24E-02 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 7,21E-03 | 2,26E-02 | 1,27E-02 | 7,51E-02 | -3,18E-02 |

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   | 5,90E+00 | 2,05E-01 | 1,01E-01 | 6,21E+00 | 5,77E-02 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,79E-02 | 1,06E-01 | 0,00E+00 | 6,40E-02 | -2,74E-02 |
| Non-hazardous waste | kg   | 1,15E+02 | 1,43E+01 | 1,35E+01 | 1,43E+02 | 6,38E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 9,39E-01 | 1,17E+01 | 0,00E+00 | 4,66E+02 | -3,45E-01 |
| Radioactive waste   | kg   | 4,37E-03 | 1,28E-03 | 2,04E-04 | 5,86E-03 | 4,08E-04 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 5,72E-04 | 7,46E-04 | 0,00E+00 | 4,54E-04 | -1,39E-04 |

### 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   | 7,04E+00 | 0,00E+00 | 0,00E+00 | 7,04E+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   | 1,49E+00 | 0,00E+00 | 0,00E+00 | 1,49E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 1,86E+03 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg   | 7,58E-01 | 0,00E+00 | 0,00E+00 | 7,58E-01 | 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 |

### 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               | 2,31E+02 | 1,24E+01 | 2,34E+00 | 2,45E+02 | 3,62E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 5,89E+00 | 6,93E+00 | 1,04E+01 | 2,41E+00 | -1,45E+00 |
| Ozone depletion Pot. | kg CFC-11e                         | 4,57E-06 | 2,26E-06 | 3,62E-07 | 7,19E-06 | 7,13E-07 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,01E-06 | 1,31E-06 | 1,79E-06 | 8,01E-07 | -2,47E-07 |
| Acidification        | kg SO <sub>2</sub> e               | 5,53E-01 | 1,33E-01 | 4,29E-03 | 6,90E-01 | 7,76E-03 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,76E-03 | 1,42E-02 | 1,54E-02 | 9,71E-03 | -2,24E-03 |
| Eutrophication       | kg PO <sub>4</sub> <sup>3</sup> e  | 1,01E-01 | 1,53E-02 | 2,43E-03 | 1,19E-01 | 1,57E-03 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 1,54E-03 | 2,87E-03 | 2,72E-03 | 1,88E-03 | -4,72E-04 |
| POCP ("smog")        | kg C <sub>2</sub> H <sub>4</sub> e | 2,75E-02 | 4,17E-03 | 3,81E-04 | 3,21E-02 | 4,47E-04 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 9,02E-04 | 9,01E-04 | 1,59E-03 | 7,12E-04 | -2,38E-04 |
| ADP-elements         | kg Sbe                             | 6,26E-04 | 1,80E-04 | 1,40E-05 | 8,20E-04 | 6,51E-05 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 9,06E-06 | 1,19E-04 | 1,60E-05 | 2,24E-05 | -3,62E-06 |
| ADP-fossil           | MJ                                 | 8,06E+02 | 1,86E+02 | 3,11E+01 | 1,02E+03 | 5,94E+01 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 8,17E+01 | 1,09E+02 | 1,44E+02 | 6,86E+01 | -2,09E+01 |

## 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 compliancy 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.

Sergio Ballen Zamora, as an authorized verifier acting for EPD Hub Limited  
24.11.2023

