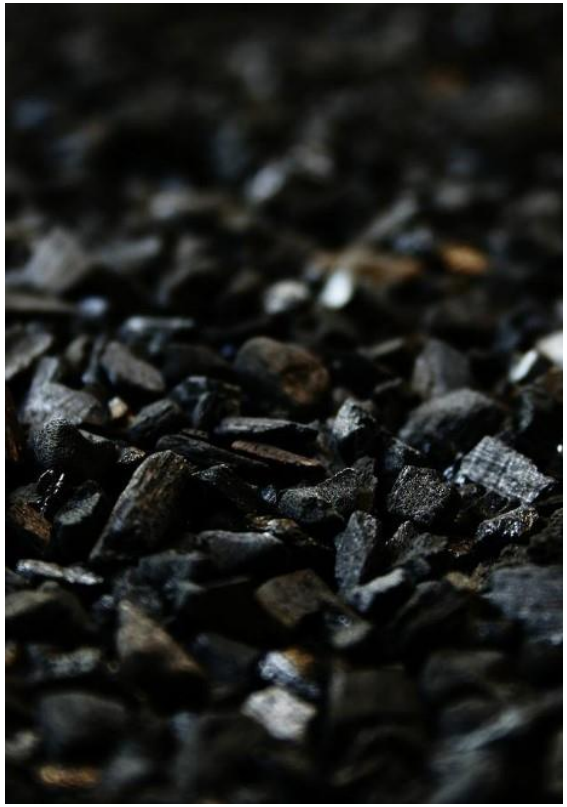
# ENVIRONMENTAL PRODUCT DECLARATION

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

**GRK Biocarbon**
**GRK Infra Oyj**



**EPD HUB, EPDHUB-0132**
Publishing date 29 September 2022, last updated date 23 May 2023, valid until 29 March 2024

Created with One Click LCA

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | GRK Infra Oyj |
| Address | Jaakonkatu 2, 01620 Vantaa |
| Contact details | maija.hakala@grk.fi |
| Website | https://www.grk.fi |

## 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 |
| Sector | Construction product |
| Category of EPD | Design phase EPD |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules C1-C4, D |
| EPD author | Jori Jokela, Macon Oy |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal certification ☑ External verification |
| EPD verifier | E.A as an authorized verifier acting for EPD Hub |

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 | GRK Biocarbon |
| Place of production | Rantsila, Finland |
| Period for data | August 2022 |
| Averaging in EPD | No averaging |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 kg |
| **Declared unit mass** | 1 kg |
| **GWP-fossil, A1-A3 (kgCO2e)** | 0.232 |
| **GWP-total, A1-A3 (kgCO2e)** | -2.58 |
| **Secondary material, inputs (%)** | 0.0098 |
| **Secondary material, outputs (%)** | 0.0 |
| **Total energy use, A1-A3 (kWh)** | 4.71 |
| **Total water use, A1-A3 (m3e)** | 0.0012 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

GRK is a Finnish construction group that operates in Finland, Sweden and Estonia. We employ almost 1000 professionals and our revenue in 2021 was almost EUR 431 million.

Our activities have a long-lasting impact on the surrounding society, as the lifespan of infrastructure can be dozens or even hundreds of years. We are actively developing more resource-efficient solutions and low-carbon materials. Biochar production is one of our future solutions for low carbon construction, by using biochar in surface soil and as C-sink.

Further information about GRK can be found at https://www.grk.fi.

## PRODUCT DESCRIPTION

GRK Biocarbon is an urban biochar. Dried wood chips are pyrolyzed in a low oxygenous climate in order to form biochar. Wood which is used and processed in the biochar pyrolysis is recycled material.

Biochar will be used as soil construction material in an infra construction site. Biochar particle size 0 - 50 mm and envelope density 0,2 - 0,6 g/cm3. EBC Standard is under process.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

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

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

| | |
|---|---|
| Biogenic carbon content in product, kg C | 0,8 |
| Biogenic carbon content in packaging, kg C | 0,003 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 kg |
| Mass per declared unit | 1 kg |

## 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 | MNR | MNR | MNR | 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)

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 environmental impacts of raw material supply (A1) include emissions generated when raw materials are taken from nature, transported to industrial units for processing (A2) and processed (A3), along with waste handling from the various production processes. All major upstream processes are taken into consideration, including infrastructure. This stage includes all the aforementioned for the raw materials which end up in the final product (product and packaging) as well as the electricity and heat production which are consumed during the manufacturing at the plant.

Biochar production process (A3) consists of pyrolysis. Pyrolysis is the heating of an organic material in the absence of oxygen. End product is bio based carbon. Readymade GRK Biocarbon is packed into big bags (flexible intermediate bulk container; FIBC) made by Polypropylene (PP).

## 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.

The transportation distance is defined according to standard EN 15804:2019 + A2. Manufacturing plant is taking place in Rantsila region of Finland. The average transportation distance from manufacturing site to construction site is calculated as 330 km and the transportation method is assumed to be lorry. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses.

Lorry crane will be used for unloading. Biocarbon installation (A5) can be then conducted by shovel or a bucket loader. Package materials will be utilized in energy recovery in the end of life.

## 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)

Biochar is assumed to have negligible effects. It is assumed that 100% of biochar (inert) is left on the ground as carbon storage. So C1, C2 and C3 modules are not relevant. Due to the recycling process plastic packaging material and wooden material (pallets) is converted into energy in the end-of-life (D4, D).

# 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 | No allocation |
| Packaging materials | Allocated by mass or volume |
| Ancillary materials | Allocated by mass or volume |
| Manufacturing energy and waste | Allocated by mass or volume |

## AVERAGES AND VARIABILITY

| | |
|---|---|
| Type of average | No averaging |
| Averaging method | 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 | kg $CO_2$e | -5,31E0 | 1,69E-2 | 2,72E0 | -2,58E0 | 3,06E-2 | 8,8E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,83E0 | -4,3E-2 |
| GWP – fossil | kg $CO_2$e | 1,21E-1 | 1,69E-2 | 9,46E-2 | 2,32E-1 | 3,09E-2 | 8,8E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,17E-2 | -5,13E-2 |
| GWP – biogenic | kg $CO_2$e | -5,43E0 | 1,23E-5 | 2,62E0 | -2,81E0 | 2,24E-5 | 2,4E-4 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,82E0 | 8,57E-3 |
| GWP – LULUC | kg $CO_2$e | 1,75E-3 | 5,1E-6 | 3,95E-4 | 2,15E-3 | 9,3E-6 | 7,26E-5 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 6,5E-6 | -2,87E-4 |
| Ozone depletion pot. | kg $CFC_{-11}$e | 2,51E-8 | 3,98E-9 | 1,23E-8 | 4,14E-8 | 7,26E-9 | 1,85E-7 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 3,42E-9 | -6,14E-9 |
| Acidification potential | mol $H^+$e | 5,84E-4 | 7,11E-5 | 1,26E-3 | 1,92E-3 | 1,3E-4 | 8,97E-3 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,76E-4 | -5,11E-4 |
| EP-freshwater | kg Pe | 1,17E-5 | 1,38E-7 | 1,87E-5 | 3,05E-5 | 2,51E-7 | 3,47E-6 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1E-5 | -3,41E-6 |
| EP-marine | kg Ne | 2,06E-4 | 2,14E-5 | 3,13E-4 | 5,41E-4 | 3,91E-5 | 3,96E-3 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 3,18E-5 | -6,12E-5 |
| EP-terrestrial | mol Ne | 2,19E-3 | 2,37E-4 | 4,73E-3 | 7,16E-3 | 4,32E-4 | 4,34E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 3,52E-4 | -7,34E-4 |
| POCP (“smog”) | kg NMVOCe | 8,74E-4 | 7,61E-5 | 9,67E-4 | 1,92E-3 | 1,39E-4 | 1,19E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,09E-4 | -2E-4 |
| ADP-minerals & metals | kg Sbe | 1,16E-6 | 2,89E-7 | 5,66E-6 | 7,11E-6 | 5,27E-7 | 1,31E-6 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,31E-7 | -1,21E-7 |
| ADP-fossil resources | MJ | 1,7E0 | 2,63E-1 | 1,7E0 | 3,66E0 | 4,8E-1 | 1,18E1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 2,65E-1 | -1,22E0 |
| Water use | $m^3$e depr. | 1,13E-2 | 9,8E-4 | 6,7E-2 | 7,92E-2 | 1,79E-3 | 2,2E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,14E-2 | -9,87E-3 |

## 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 | 4,92E-9 | 1,53E-9 | 1,57E-8 | 2,21E-8 | 2,79E-9 | 2,38E-7 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,83E-9 | -4,13E-9 |
| Ionizing radiation | kBq U235e | 7,35E-3 | 1,15E-3 | 3,75E-3 | 1,22E-2 | 2,1E-3 | 5,06E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,07E-3 | -1,96E-2 |
| Ecotoxicity (freshwater) | CTUe | 1,29E0 | 2,01E-1 | 1,04E1 | 1,19E1 | 3,67E-1 | 6,93E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,77E0 | -1,59E0 |
| Human toxicity, cancer | CTUh | 7,39E-11 | 5,15E-12 | 1,52E-10 | 2,31E-10 | 9,39E-12 | 2,49E-10 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,71E-11 | -2,15E-11 |
| Human tox. non-cancer | CTUh | 1,67E-9 | 2,39E-10 | 6,29E-9 | 8,2E-9 | 4,35E-10 | 6,17E-9 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 3,94E-10 | -6,05E-10 |
| SQP | - | 3,07E-1 | 3,98E-1 | 2,89E-1 | 9,94E-1 | 7,25E-1 | 3,05E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 8,88E-1 | -6,37E-2 |

## 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 | MJ | 4,84E0 | 3,32E-3 | 8,45E0 | 1,33E1 | 6,05E-3 | 6,4E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 6,73E-3 | -3,82E-1 |
| Renew. PER as material | MJ | 5,64E1 | 0E0 | 9,4E-2 | 5,65E1 | 0E0 | -2,8E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Total use of renew. PER | MJ | 6,12E1 | 3,32E-3 | 8,54E0 | 6,98E1 | 6,05E-3 | -2,74E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 6,73E-3 | -3,82E-1 |
| Non-re. PER as energy | MJ | 1,7E0 | 2,63E-1 | 1,7E0 | 3,66E0 | 4,8E-1 | 1,18E1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 2,65E-1 | -1,22E0 |
| Non-re. PER as material | MJ | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | -5,2E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Total use of non-re. PER | MJ | 1,7E0 | 2,63E-1 | 1,7E0 | 3,66E0 | 4,8E-1 | 1,13E1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 2,65E-1 | -1,22E0 |
| Secondary materials | kg | 0E0 | 0E0 | 9,76E-5 | 9,76E-5 | 0E0 | 0E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Renew. secondary fuels | MJ | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Non-ren. secondary fuels | MJ | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Use of net fresh water | $m^3$ | 5,89E-4 | 5,48E-5 | 5,35E-4 | 1,18E-3 | 1E-4 | 1,05E-3 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 2,9E-4 | -2,72E-4 |

## 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 | 3,22E-3 | 2,56E-4 | 6,55E-3 | 1E-2 | 4,67E-4 | 1,28E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 9,6E-4 | -5,44E-3 |
| Non-hazardous waste | kg | 5,85E-2 | 2,83E-2 | 2,08E-1 | 2,95E-1 | 5,17E-2 | 1,47E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 9,99E-1 | -1,04E-1 |
| Radioactive waste | kg | 1,14E-5 | 1,81E-6 | 3,89E-6 | 1,71E-5 | 3,3E-6 | 8,26E-5 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,57E-6 | -9,23E-6 |

## 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 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Materials for recycling | kg | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Materials for energy rec | kg | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 1,53E-2 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Exported energy | MJ | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 5,1E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |

## 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 $CO_2$e | 1,21E-1 | 1,68E-2 | 9,13E-2 | 2,29E-1 | 3,06E-2 | 8,74E-1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,61E-2 | -4,96E-2 |
| Ozone depletion Pot. | kg $CFC_{-11}$e | 2,01E-8 | 3,16E-9 | 1,24E-8 | 3,57E-8 | 5,77E-9 | 1,47E-7 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 2,79E-9 | -6,84E-9 |
| Acidification | kg $SO_2$e | 3,78E-4 | 3,45E-5 | 8,75E-4 | 1,29E-3 | 6,29E-5 | 1,27E-3 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,35E-3 | -4,45E-4 |
| Eutrophication | kg $PO_4^3$e | 1,37E-4 | 6,96E-6 | 3,18E-4 | 4,62E-4 | 1,27E-5 | 2,25E-4 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 3,18E-4 | -1E-4 |
| POCP (“smog”) | kg $C_2H_4$e | 6,44E-5 | 2,18E-6 | 3,78E-5 | 1,04E-4 | 3,98E-6 | 1,3E-4 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 7,44E-6 | -1,84E-5 |
| ADP-elements | kg Sbe | 1,16E-6 | 2,89E-7 | 5,66E-6 | 7,11E-6 | 5,27E-7 | 1,31E-6 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 1,31E-7 | -1,21E-7 |
| ADP-fossil | MJ | 1,7E0 | 2,63E-1 | 1,7E0 | 3,66E0 | 4,8E-1 | 1,18E1 | MND | MND | MND | MND | MND | MND | MND | 0E0 | 0E0 | 0E0 | 2,65E-1 | -1,22E0 |

# 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.

Elma Avdyli as an authorized verifier acting for EPD Hub Limited
29.09.2022

VERIFIED ISO 14025