ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Betongbrunnar - Concrete manholes
Benders Sverige AB

EPD HUB, HUB-6168
Published on 03.05.2026, last updated on 03.05.2026, valid until 03.05.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Benders Sverige AB
Address	Box 20, 535 21 Kvänum, Sweden
Contact details	info@benders.se
Website	https://www.benders.se/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025 EN 16757 Product Category Rules for concrete and concrete elements
Sector	Construction product
Parent EPD number	HUB-4990
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	Sofia Bender
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☐ External verification
EPD verifier	Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub

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	Betongbrunnar - Concrete manholes
Additional labels	VA
Product reference	-
Place(s) of raw material origin	Sweden and EU
Place of production	Benders Södra Sandby och Uddevalla, Sweden
Place(s) of installation and use	Sweden
Period for data	Calendar year 2024
Averaging in EPD	Multiple products and multiple factories
Variation in GWP-fossil for A1-A3 (%)	+27
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	97

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton of concrete manhole
Declared unit mass	1000 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	96,6
GWP-total, A1-A3 ($kgCO_2e$)	96,7
Secondary material, inputs (%)	2,28
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	288
Net freshwater use, A1-A3 (m^3)	0,54

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Benders is a Swedish family-owned company that develops, produces, and markets competitive, high-quality products and services for the construction and civil engineering sectors. Benders operates in several different business areas and is one of the market-leading producers of concrete and natural stone products in the Nordic countries. Benders is certified according to ISO 14001:2015.

PRODUCT DESCRIPTION

The products included in this study are concrete manholes designed for installation in underground water and sewage systems. The products are used as sealed gravity pipelines for wastewater and stormwater and are part of the ALFA sewage systems.

The product line includes manholes and associated parts such as covers, cover slabs, cones, rings, and risers. These manholes are available in a variety of lengths and diameters. The concrete pipes consist of aggregate, cement (and in some products granulated blast furnace slag), water and small amounts of concrete additive. The diameter varies between 0,15 – 3 m and the height between 0,2 - 2,6 m but exceptions can be made.

The concrete manholes are manufactured in accordance with SS-EN 1917 and SS 22 70 01, and the concrete quality meets the requirements for frost resistance as specified in SS 13 72 44. They are dimensioned for loads according to EN 476 and meet functional requirements according to Svenskt Vatten P45. Strength classes: 30, 44, 110, or 240. Compressive strength of concrete: fck = 40 MPa.

A representative concrete recipe, based on production volumes, has been used. The concrete mix designs vary and the product containing the highest amount of cement will have the greatest climate impact—approximately 27% higher than the representative product from Södra Sandby that contains granulated blast furnace slag.

This LCA study includes the provision of all materials, transportation, energy and emission flows, and end-of-life processing of the product. All industrial processes from raw material acquisition and pre-processing, production, product distribution and installation, and end-of-life management are included.

The production of capital equipment, construction activities and infrastructure, maintenance and operation of capital equipment, personnel-related activities, and energy and water use related to company management and sales activities are excluded.

Further information can be found at: https://www.benders.se/

PRODUCT RAW MATERIAL MAIN COMPOSITION

RAW MATERIAL CATEGORY	AMOUNT, MASS %	MATERIAL ORIGIN
Metals	0	-
Minerals	100	Sweden
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 ton of concrete manhole
Mass per declared unit	1000 kg
Functional unit	N/A
Reference service life	N/A

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	ND	ND	ND	ND	ND	ND	ND	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

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in production. 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.

All the electricity used in manufacturing is green energy, demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD

Two factories are considered: Uddevalla and Södra Sandby. The environmental impacts assessed for the product stage include the manufacturing of raw materials used in production. Small amounts of packaging are excluded, and no ancillary materials are used. The concrete mixture consists of cement (and in some cases granulated blast furnace slag), locally sourced aggregates, water. (A1)
Raw materials are transported by truck and, in some cases, by sea from suppliers located on average between 10 and 566 km from the production site. (A2)

At the factory, all raw materials are weighed using a computer-controlled process. Gravel and cement are mixed, followed by dosing water into a coated cast equipped with a vibrating core. The concrete mix is then poured into the mould, and reinforcement (for applicable products) is placed. After the production cycle is completed, the cast is removed, and the manhole is cured. During production, material losses are estimated at approximately 2% for concrete, based on internal factory data. Discarded concrete is reused on-site or by local farmers. The electricity used in the manufacturing process is sourced entirely from 100% renewable hydro energy. Fuel used for on-site transportation is included. (A3)

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 transport distance is defined according to the PCR. Average distance of transportation from production plant to building site is in average 180 km and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. It may vary but as 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

return trips are used by the transportation company to serve the needs of other clients. Transportation does not cause losses as products are fastened properly.

No materials are used during installation, but energy used in building machines is considered. No materials are lost during installation since the products arrive complete and ready for use. Energy consumption for installation by cranes is assumed as 0.01 kWh/kg. The source of energy is diesel fuel used by work machines.

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 as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines and is assumed to be 0.01 kWh/kg based on Gervasio, H. & Dimova, S., JRC Technical report: Model for Life Cycle Assessment (LCA) of buildings, 2018. (C1)

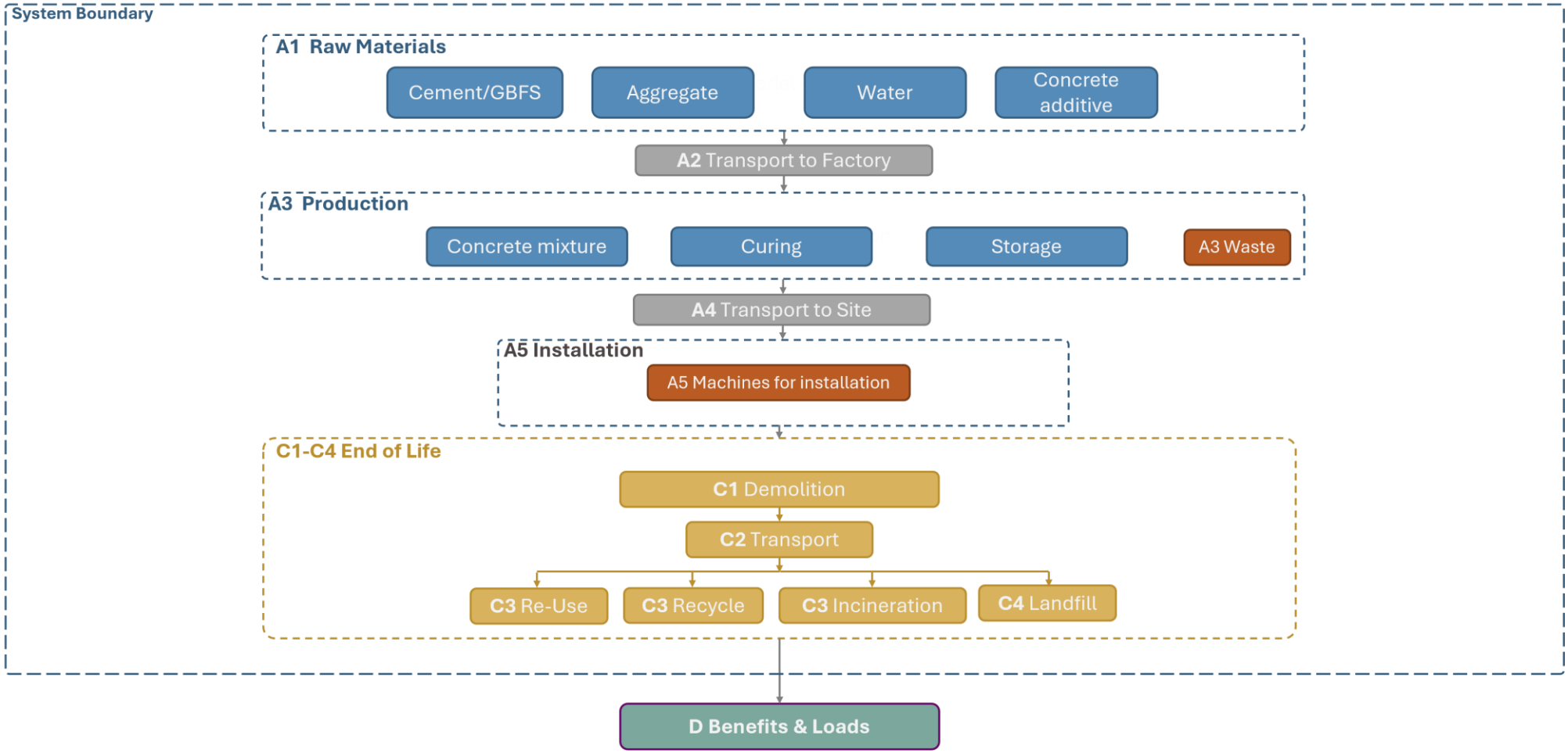
The dismantled concrete manholes are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed having the same weight as the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the most common transportation method is lorry (C2).

At the waste treatment plant, waste that can be reused, or recycled separated and diverted for further use. It can be assumed that 100% of the concrete manholes are transported to a waste treatment plant, where the pipes are crushed and separated. Approximately 80% of the concrete (Betoniteollisuus ry, 2020) are recycled. Process losses at the treatment facility are considered negligible (C3). The remaining 20% are assumed to be sent to landfill (C4)

Due to the recycling potential of concrete, it can be crushed and used as secondary raw material, which avoids the use of virgin raw materials. The 80% of concrete going to waste processing is converted into secondary raw materials after recycling. The recycled material content in the concrete itself is 0,5%, according to the EPDs used for the calculations (D).

The end-of-life scenarios (C1–C4) and potential reuse, recovery, and recycling (D) described in this EPD are currently in use and reflect the most likely and representative practices for the product's lifecycle. These scenarios are based on industry standards and typical regional waste management procedures, ensuring realistic and applicable modeling of environmental impacts.

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 that is 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.

The cut-off criteria applied in this study follow EN 15804 and the applicable PCR. Individual unit processes contributing less than 1% of total mass or energy flows may be excluded, provided that the sum of all neglected flows does not exceed 5% of total mass or energy.

Assumptions and applications - all major raw materials, energy inputs, and outputs for which data was available have been included. Minor components with negligible environmental impact were excluded due to lack of data, but these exclusions comply with the cut-off criteria. No hazardous substances were
omitted.

The following omissions of the life cycle stages declared are:
- Production and maintenance of capital equipment
- Construction activities and infrastructure
- Personnel-related activities
- Energy and water use related to company management and sales

The following inputs were excluded due to negligible contribution:
- Reinforcement (<0,65%)
- EPS for molding (0,15%).
- Form release oil (<0.01%)
- Plastic spacers (<0.01%)
- Wooden pallet for packaging (<0.06%)

These exclusions do not exceed the 1% per process and 5% total thresholds and have negligible impact on overall results.

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/AC:2021 and JRC EF 3.1.

Note on indicator consistency: A technical inconsistency between PENRT (Total use of non-renewable primary energy) and ADP-fossil (Abiotic depletion potential for fossil resources) results in modules A1-A3 has been identified. The discrepancy originates from the specific characterization factors in the background environmental profiles of two raw materials (Portland cement and superplasticizer admixture for concrete). These inconsistencies are inherent to the third-party verified EPDs and background databases used and cannot be adjusted by the practitioner.

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	Not applicable
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

All estimations and assumptions are given below.
Proxy data is used for certain materials due to their unavailability in the database.
- Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small, the variety in load is assumed to be negligible. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints.
- Module A4: Transportation does not cause losses as products are packaged properly. Also, volume capacity utilization factor is assumed to be 1 for the nested packaged products. Additionally, transportation distance is assumed to be 100 km and a lorry is the assumed vehicle type used.
- Module C2: Transportation distance to waste handling facility is estimated as 50 km and the transportation method is assumed as lorry.
- Module C3, C4, D: 80% of concrete is sent for recycling while the remaining 20% is assumed to be landfilled.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products and multiple factories
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	27

This EPD refers to products with similar recipes from two production facilities: Uddevalla and Södra Sandby. Based on annual production volumes a representative product is presented. The included products are within the same range; all are prefabricated concrete manholes used for installation in underground water and sewage systems.

The concrete mix designs vary and the product containing the highest amount of cement will have the greatest climate impact—approximately 27% higher than the representative product from Södra Sandby that contains granulated blast furnace slag.

The concrete mix designs may vary slightly in terms of the proportion of cement and aggregate. The range of products included in this EPD complies with the allowed averaging and aggregation requirements defined in the GPI. There are no restrictions to the use of this EPD due to averaging. The declared results and content are representative of products manufactured at the two production sites. Geographical coverage of the averaging is limited to these two sites.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.4. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

A5:
- (Abey and Anand, 2019)
C1-C4:
- (Betoniteollisuus ry, 2020) .
- H. & Dimova, S., JRC Technical report: Model for Life Cycle Assessment (LCA) of buildings, 2018.
D:
- (RC Technical report, 2018)
- (World Steel Association, 2020)

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO2e	8,46E+01	3,66E+00	8,38E+00	9,67E+01	1,93E+01	3,61E+00	ND	ND	ND	ND	ND	ND	ND	3,61E+00	5,39E+00	3,52E+00	4,46E+00	1,52E+02
GWP – fossil	kg CO2e	8,46E+01	3,66E+00	8,38E+00	9,66E+01	1,93E+01	3,60E+00	ND	ND	ND	ND	ND	ND	ND	3,60E+00	5,38E+00	3,52E+00	4,45E+00	1,51E+02
GWP – biogenic	kg CO2e	2,97E-02	7,80E-04	3,11E-03	3,36E-02	4,06E-03	3,68E-04	ND	ND	ND	ND	ND	ND	ND	3,68E-04	1,22E-03	6,70E-04	-1,06E-03	0,00E+00
GWP – LULUC	kg CO2e	4,41E-02	1,63E-03	1,09E-03	4,68E-02	7,25E-03	3,69E-04	ND	ND	ND	ND	ND	ND	ND	3,69E-04	2,41E-03	3,60E-04	9,40E-03	4,65E-01
Ozone depletion pot.	kg CFC-11e	1,59E-07	6,46E-08	7,40E-07	9,64E-07	3,88E-07	5,52E-08	ND	ND	ND	ND	ND	ND	ND	5,52E-08	7,95E-08	5,22E-08	8,80E-08	2,61E-06
Acidification potential	mol H+e	1,52E-01	2,39E-02	5,57E-02	2,31E-01	6,22E-02	3,25E-02	ND	ND	ND	ND	ND	ND	ND	3,25E-02	1,84E-02	3,14E-02	2,74E-02	7,54E-01
EP-freshwater[2)]	kg Pe	4,16E-03	2,45E-04	2,35E-04	4,64E-03	1,30E-03	1,04E-04	ND	ND	ND	ND	ND	ND	ND	1,04E-04	4,19E-04	1,13E-04	3,19E-04	1,34E-01
EP-marine	kg Ne	5,39E-02	6,35E-03	2,27E-02	8,29E-02	2,11E-02	1,51E-02	ND	ND	ND	ND	ND	ND	ND	1,51E-02	6,03E-03	1,46E-02	1,11E-02	1,29E-01
EP-terrestrial	mol Ne	6,40E-01	6,99E-02	2,49E-01	9,59E-01	2,30E-01	1,65E-01	ND	ND	ND	ND	ND	ND	ND	1,65E-01	6,56E-02	1,60E-01	1,20E-01	1,10E+00
POCP ("smog")[3)]	kg NMVOC	1,67E-01	2,53E-02	7,49E-02	2,67E-01	1,01E-01	4,93E-02	ND	ND	ND	ND	ND	ND	ND	4,93E-02	2,70E-02	4,79E-02	4,02E-02	3,82E-01
ADP-minerals & metals[4)]	kg Sbe	1,89E-02	9,35E-06	1,03E-05	1,89E-02	5,33E-05	1,29E-06	ND	ND	ND	ND	ND	ND	ND	1,29E-06	1,50E-05	1,27E-06	9,82E-06	3,42E-04
ADP-fossil resources	MJ	6,75E+02	5,22E+01	1,11E+02	8,38E+02	2,79E+02	4,72E+01	ND	ND	ND	ND	ND	ND	ND	4,72E+01	7,81E+01	4,58E+01	7,53E+01	3,56E+03
Water use[5)]	m3e depr.	2,30E+01	2,52E-01	2,27E-01	2,34E+01	1,43E+00	1,18E-01	ND	ND	ND	ND	ND	ND	ND	1,18E-01	3,86E-01	1,18E-01	2,84E-01	8,15E+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 PO4e; 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, EF 3.1

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	1,35E-06	3,25E-07	1,53E-06	3,20E-06	1,92E-06	9,25E-07	ND	ND	ND	ND	ND	ND	ND	9,25E-07	5,39E-07	6,85E-06	2,14E-06	2,89E-06
Ionizing radiation6)	kBq U235e	1,37E+01	5,27E-02	2,23E-01	1,40E+01	3,37E-01	2,09E-02	ND	ND	ND	ND	ND	ND	ND	2,09E-02	6,80E-02	1,95E-02	5,32E-02	9,86E+01
Ecotoxicity (freshwater)	CTUe	2,22E+02	6,31E+00	2,94E+01	2,57E+02	3,29E+01	2,60E+00	ND	ND	ND	ND	ND	ND	ND	2,60E+00	1,10E+01	2,62E+01	1,60E+01	3,83E+02
Human toxicity, cancer	CTUh	1,75E-08	6,38E-10	1,04E-09	1,91E-08	3,18E-09	3,71E-10	ND	ND	ND	ND	ND	ND	ND	3,71E-10	8,88E-10	3,59E-10	8,94E-10	5,64E-08
Human tox. non-cancer	CTUh	1,99E-07	3,12E-08	2,43E-08	2,55E-07	1,82E-07	5,87E-09	ND	ND	ND	ND	ND	ND	ND	5,87E-09	5,06E-08	5,64E-09	3,04E-08	2,67E-06
SQP7)	-	1,96E+02	4,64E+01	6,76E+00	2,49E+02	2,81E+02	3,30E+00	ND	ND	ND	ND	ND	ND	ND	3,30E+00	7,87E+01	3,03E+00	8,74E+01	5,38E+02

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 energy8)	MJ	5,49E+01	7,58E-01	1,15E+02	1,70E+02	4,55E+00	2,99E-01	ND	ND	ND	ND	ND	ND	ND	2,99E-01	1,07E+00	2,87E-01	8,65E-01	8,25E+02
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,49E+01	7,58E-01	1,15E+02	1,70E+02	4,55E+00	2,99E-01	ND	ND	ND	ND	ND	ND	ND	2,99E-01	1,07E+00	2,87E-01	8,65E-01	8,25E+02
Non-re. PER as energy	MJ	4,59E+02	5,22E+01	1,11E+02	6,22E+02	2,79E+02	4,72E+01	ND	ND	ND	ND	ND	ND	ND	4,72E+01	7,81E+01	4,58E+01	7,53E+01	3,56E+03
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	4,59E+02	5,22E+01	1,11E+02	6,22E+02	2,79E+02	4,72E+01	ND	ND	ND	ND	ND	ND	ND	4,72E+01	7,81E+01	4,58E+01	7,53E+01	3,56E+03
Secondary materials	kg	2,28E+01	2,34E-02	3,49E-02	2,29E+01	1,21E-01	1,96E-02	ND	ND	ND	ND	ND	ND	ND	1,96E-02	3,32E-02	1,90E-02	2,73E-02	2,15E+00
Renew. secondary fuels	MJ	1,03E+02	2,56E-04	8,33E-05	1,03E+02	1,52E-03	5,12E-05	ND	ND	ND	ND	ND	ND	ND	5,12E-05	4,22E-04	4,97E-05	3,60E-04	1,70E-03
Non-ren. secondary fuels	MJ	1,40E+02	0,00E+00	0,00E+00	1,40E+02	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m3	5,27E-01	7,24E-03	9,55E-03	5,43E-01	4,13E-02	3,12E-03	ND	ND	ND	ND	ND	ND	ND	3,12E-03	1,15E-02	2,93E-03	3,77E-02	2,70E+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	3,75E+00	8,06E-02	1,26E-01	3,96E+00	4,04E-01	5,25E-02	ND	ND	ND	ND	ND	ND	ND	5,25E-02	1,32E-01	5,14E-02	1,07E-01	9,14E+00
Non-hazardous waste	kg	2,32E+01	1,50E+00	2,26E+00	2,70E+01	8,09E+00	7,15E-01	ND	ND	ND	ND	ND	ND	ND	7,15E-01	2,45E+00	7,48E-01	2,06E+00	6,62E+02
Radioactive waste	kg	5,51E-03	1,30E-05	3,10E-04	5,83E-03	8,33E-05	5,12E-06	ND	ND	ND	ND	ND	ND	ND	5,12E-06	1,67E-05	4,79E-06	1,30E-05	2,53E-02

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	8,05E-04	0,00E+00	0,00E+00	8,05E-04	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,08E-01	0,00E+00	2,00E+01	2,01E+01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	2,42E-04	0,00E+00	0,00E+00	2,42E-04	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	4,62E-03	0,00E+00	0,00E+00	4,62E-03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

SCENARIO DOCUMENTATION

DATA SOURCES

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

1. Light fuel oil, World, One Click LCA, 3.10 kgCO2e/l
2. Electricity production, hydro, run-of-river, Sweden, Ecoinvent, 0.0044 kgCO2e/kWh
3. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO2e/MJ
4. Market for heat, district or industrial, other than natural gas, Albania, Ecoinvent, 0.0707 kgCO2e/MJ

TRANSPORT SCENARIO DOCUMENTATION - A4 (TRANSPORT RESOURCES)

1. Transport, freight, lorry >32 metric ton, EURO5, 180.0 km

TRANSPORT SCENARIO DOCUMENTATION A4

SCENARIO PARAMETER	VALUE
Capacity utilization (including empty return) %	100
Bulk density of transported products	2,38E+03
Volume capacity utilization factor	1

INSTALLATION SCENARIO DOCUMENTATION - A5 (INSTALLATION RESOURCES)

1. Diesel, burned in building machine, Ecoinvent, 10.0 kWh

END-OF-LIFE SCENARIO DOCUMENTATION - C1-C4 (DATA SOURCE)

1. Diesel, burned in building machine, Ecoinvent, 10.0 kWh
2. Treatment of waste concrete, not reinforced, recycling, Ecoinvent, 800.0 kg
3. Treatment of waste concrete, not reinforced, collection for final disposal, Ecoinvent, 200.0 kg

SCENARIO INFORMATION	VALUE
Scenario assumptions e.g. transportation	50 km by lorry

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier:

Tool verification validity:

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
03.05.2026