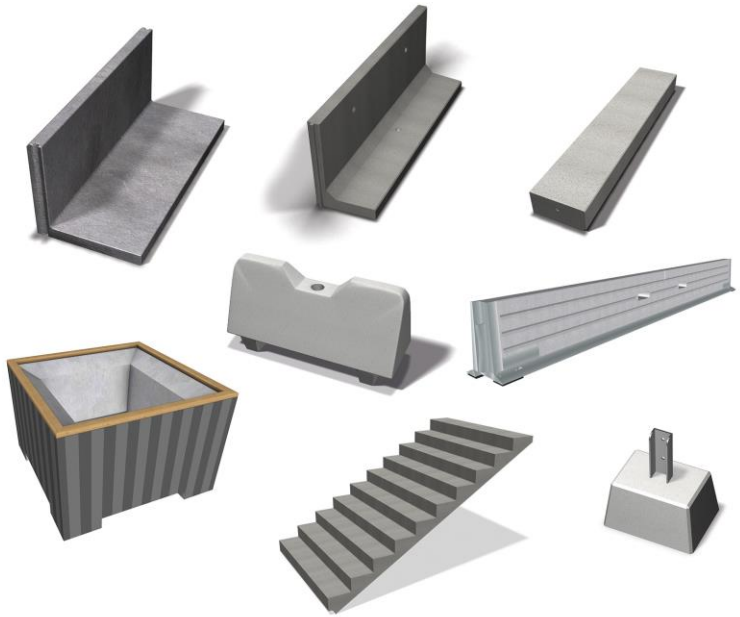
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Concrete retaining walls, barriers and stairs

Benders Sverige AB



EPD HUB, HUB-6166
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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	Lars Andersgården 1, 535 93 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
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4, and modules C1-C4, D
EPD author	Sofia Bender
EPD verification	Independent verification of this EPD and data, according to ISO 14025: o Internal verification þ 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	Concrete retaining walls, barriers and stairs
Additional labels	Infrastructure
Product reference	-
Place(s) of raw material origin	Sweden and EU
Place of production	Benders Åstorp, Götene and Uddevalla, Sweden
Place(s) of installation and use	Sweden and Europe
Period for data	Calendar year 2025
Averaging in EPD	Multiple products and multiple factories
Variation in GWP-fossil for A1-A3 (%)	-8% / +34%
A1-A3 Specific data (%)	96,4

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton
Declared unit mass	1000 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 (kgCO_2e)	96,3
GWP-total, A1-A3 (kgCO_2e)	96,3
Secondary material, inputs (%)	2,57
Secondary material, outputs (%)	80,1
Total energy use, A1-A3 (kWh)	283
Net freshwater use, A1-A3 (m^3)	0,62

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 are part of Benders Infrastructure range which includes products for road, rail and other infrastructure projects. The products included in this EPD are retaining walls ("L- och T-stöd"), barriers (e.g.. "roadblock, barriär, gris och kloss"," betongmöbler" and "plintar och pollare" etc..), stairs (e.g. "trappblock and blocktrappor"), The products included in this study are produced at our facilities in Åstorp, Götene and Uddevalla.

Retaining walls are used, for example, for terraces and parks, for roads, loading docks and loading bays. They can also be used for creating or manage short level differences at road junctions, parking lots and loading docks, among other things. The range includes many combinations of different lengths and heights. Customization is also possible to achieve, for example, inclined height.

Barriers are used where you want to create clear and effective boundaries at, for example, entrances or road environments or as foundations for signs. They can be easily assembled as permanent or temporary dividers. With our concrete furniture, you can create a stylish and safe environment.
Stairs are produced in both one piece and in blocks. The product allows you to quickly and easily build stairs in different environments. They are available in a range of lengths to meet unique needs. They are well suited as both entrance stairs and terrain stairs in public environments.

The products have similar recipes. Based on annual production volumes, a representative product is presented. The amount of reinforcing steel varies, and the amount of reinforcement has been distributed based on production volumes. The

products containing the highest amount of reinforcement and most cement (Sicura) have a GWP value of +34% (A1-A3). Some products do not contain reinforcement (betonggris) and have a GWP value of -8% (A1-A3).

The retaining walls are manufactured in accordance with NS-EN 15258:2008 and the stairs are manufactured according to NS-EN 13369:2018.
This LCA study includes the provision of all materials, transport, energy and emission flows and the final processing of the product. All industrial processes from raw material procurement and pre-processing, production, product distribution and installation, and end-of-life management are included.

Production of capital equipment, construction and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are not included. For more information, visit www.benders.se.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	1,7	EU
Minerals	98,3	Sweden
Fossil materials	-	-
Bio-based materials	-	-

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
Mass per declared unit	1000 kg
Functional unit	N/A
Reference service life	N/A

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
N/A		
N/A		
N/A		
N/A		

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	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 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.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The concrete mixture consists of cement, locally sourced aggregates, water, and steel reinforcement (some products do not contain reinforcement). (A1) The raw materials are transported by truck from suppliers located within 40–220 km of the production site, minimizing transport-related impacts. (A2).

The mixture is placed into a steel mold and, if necessary, compacted to the required density through vibration. (A3) During production, material losses concerning concrete are estimated at approximately 2% and reinforcement 5% based on internal factory data. The energy used in the manufacturing process is only sourced from 100% renewable hydro energy (A3).
After molding, the concrete is demolded and allowed to be cured for one day. Fuel used for on-site transportation is included. (A3)

Manufacturing waste is handled responsibly. Discarded concrete is reused on-site or by local farmers, approximately 20 km away, while waste reinforcement is sent to a local sorting plant located on average 8 km from the factory.

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.

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.

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 average distance of transportation from production plant to building site is 240 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 (A5).

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)

Energy consumption for demolition of the product is assumed to be 0.01 kWh/kg based on Abey and Anand, 2019. The source of energy is diesel fuel used by building machines (C1).

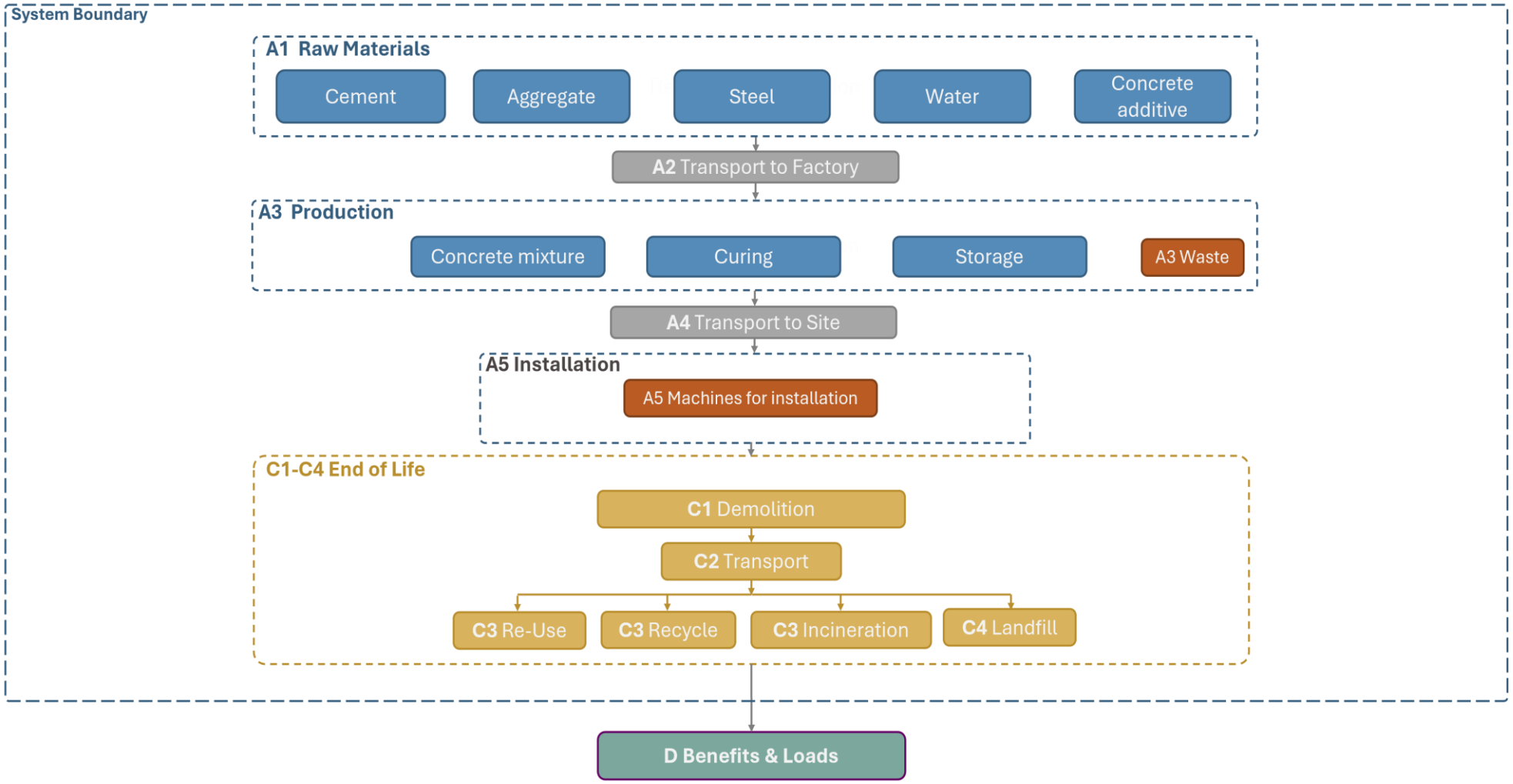
It is assumed that 100% of the dismantled product is collected as separate construction waste and transported to the nearest treatment facility. No material loss is expected during the product's use phase; therefore, the end-of-life product is considered to have the same weight as the declared product. The transportation distance to the treatment plant is estimated at 50 km, with lorry (C2) assumed as the transport method.

At the waste treatment facility, materials suitable for reuse, recycling, or energy recovery are separated and directed for further processing. It is assumed that 100% of the concrete products are transported to a treatment plant, where they are crushed and the steel is separated. Approximately 85% of the steel (World Steel Association, 2020) and 80% of the concrete (Betoniteollisuus ry, 2020) are recycled. Process losses at the treatment facility are considered negligible (C3). The remaining 15% of steel and 20% of concrete are assumed to be sent to landfill (C4).

Module D accounts for the potential benefits of material recycling after completion of modules C1 –C4. Credits are based on the net recycled output, excluding any recycled content already included in module A1. Due to the recycling potential of reinforcement steel and concrete, they can be used as secondary raw material, which avoids the use of virgin raw materials. 80% of concrete and 85% of steel going to waste processing are converted into secondary raw materials after recycling. There are no recycled material in the concrete but in steel it is 63,8%, according to the EPDs and datasets used for the calculations. Background data is taken from Ecoinvent 3.10. (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 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 production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

This LCA study includes the supply of all materials, transport, energy and emission flows, and processing at the end of the product life cycle. All industrial processes, from raw material procurement and pre-processing, production, product distribution and installation, and end-of-life management, are included.
In Module A1, some materials are excluded due to lack of data, but they do not exceed the 1% threshold. The excluded materials are form release oil (<0.01%), embedded metal inserts (<0.02%) and wooden pallets and studs (<0.04%). These materials have a negligible impact on the product's emissions.
Production of capital equipment, construction and infrastructure activities, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to business management and sales activities are excluded.

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 three raw materials (Portland cement, reinforcement steel bar (rebar) 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	Partly allocated by mass or volume
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 distances are assumed based on a particular scenario of customer's premises 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 and 85% of reinforcement is sent for recycling while the remaining 20% and 15% are assumed to be landfilled. Recycled materials displace the need for virgin material production.

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, %	-8% / +34%

This EPD covers concrete products with similar compositions manufactured at three different production sites, Uddevalla, Åstorp and Götene. Based on annual production volumes (m3) a representative product has been calculated. The products included are within the same range; all are prefabricated concrete elements used in the infrastructure sector.

The concrete mix designs may vary slightly in terms of the proportion of cement and aggregate. The amount of reinforcement varies in the finished product. The representative product is the retaining wall produced in Åstorp. The product containing the most reinforcement will have the greatest climate impact - approximately 34% higher than the representative product and the product containing no reinforcement will have the lowest climate impact - approximately 8% less. For the product named "Roadblock" the steel foot is not included and for the product "Sicura" the exterior metal and wood is not included.

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 three production sites. Geographical coverage of the averaging is limited to these three sites.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD System Verification v3.2.3. 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 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

A5:
- (Abey and Anand, 2019)
C1-C4:
- (Abey and Anand, 2019)
- (Betoniteollisuus ry, 2020)
- https://worldsteel.org/wp-content/uploads/Life-cycle-inventory-LCI-study-2020-data-release.pdf)
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 CO_2e	8,53E+01	5,57E+00	5,42E+00	9,63E+01	2,48E+01	3,61E+00	ND	ND	ND	ND	ND	ND	ND	3,61E+00	6,02E+00	5,15E+00	4,74E+00	-1,20E+01
GWP – fossil	kg CO_2e	8,53E+01	5,57E+00	5,41E+00	9,63E+01	2,48E+01	3,60E+00	ND	ND	ND	ND	ND	ND	ND	3,60E+00	6,02E+00	5,15E+00	4,73E+00	-1,20E+01
GWP – biogenic	kg CO_2e	-6,10E-02	1,30E-03	1,06E-03	-5,86E-02	5,42E-03	3,68E-04	ND	ND	ND	ND	ND	ND	ND	3,68E-04	1,36E-03	-1,19E-03	-1,09E-03	0,00E+00
GWP – LULUC	kg CO_2e	6,60E-02	2,67E-03	6,75E-04	6,93E-02	9,66E-03	3,69E-04	ND	ND	ND	ND	ND	ND	ND	3,69E-04	2,69E-03	8,97E-04	9,28E-03	-7,76E-03
Ozone depletion pot.	kg CFC-$_{11}$e	9,33E-07	8,89E-08	2,11E-07	1,23E-06	5,18E-07	5,52E-08	ND	ND	ND	ND	ND	ND	ND	5,52E-08	8,83E-08	7,82E-08	9,23E-08	-7,58E-08
Acidification potential	mol H^+e	2,21E-01	2,30E-02	4,35E-02	2,87E-01	5,86E-02	3,25E-02	ND	ND	ND	ND	ND	ND	ND	3,25E-02	2,05E-02	4,74E-02	3,02E-02	-6,49E-02
EP-freshwater[2)]	kg Pe	4,11E-03	4,31E-04	3,41E-04	4,88E-03	1,73E-03	1,04E-04	ND	ND	ND	ND	ND	ND	ND	1,04E-04	4,69E-04	3,49E-04	3,25E-04	-4,15E-03
EP-marine	kg Ne	7,20E-02	5,59E-03	1,83E-02	9,58E-02	1,54E-02	1,51E-02	ND	ND	ND	ND	ND	ND	ND	1,51E-02	6,72E-03	2,10E-02	1,24E-02	-1,51E-02
EP-terrestrial	mol Ne	8,00E-01	6,12E-02	2,00E-01	1,06E+00	1,66E-01	1,65E-01	ND	ND	ND	ND	ND	ND	ND	1,65E-01	7,31E-02	2,31E-01	1,35E-01	-1,79E-01
POCP ("smog")[3)]	kg NMVOC	2,30E-01	2,69E-02	5,99E-02	3,17E-01	1,02E-01	4,93E-02	ND	ND	ND	ND	ND	ND	ND	4,93E-02	3,00E-02	6,88E-02	4,44E-02	-5,20E-02
ADP-minerals & metals[4)]	kg Sbe	1,64E-02	1,55E-05	3,67E-06	1,64E-02	7,10E-05	1,29E-06	ND	ND	ND	ND	ND	ND	ND	1,29E-06	1,72E-05	2,49E-05	9,80E-06	-8,14E-05
ADP-fossil resources	MJ	8,14E+02	8,27E+01	6,95E+01	9,67E+02	3,73E+02	4,72E+01	ND	ND	ND	ND	ND	ND	ND	4,72E+01	8,70E+01	6,74E+01	7,89E+01	-1,33E+02
Water use[5)]	m^3e depr.	2,57E+01	4,00E-01	1,86E-01	2,63E+01	1,91E+00	1,18E-01	ND	ND	ND	ND	ND	ND	ND	1,18E-01	4,27E-01	2,36E-01	2,92E-01	-1,27E+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	1,76E-06	5,21E-07	1,28E-06	3,55E-06	2,42E-06	9,25E-07	ND	ND	ND	ND	ND	ND	ND	9,25E-07	5,88E-07	7,14E-06	2,20E-06	-1,01E-06
Ionizing radiation[6)]	kBq U235e	1,64E+01	7,03E-02	7,44E-02	1,65E+01	4,49E-01	2,09E-02	ND	ND	ND	ND	ND	ND	ND	2,09E-02	7,52E-02	6,51E-02	5,46E-02	-5,32E-01
Ecotoxicity (freshwater)	CTUe	2,05E+02	1,13E+01	9,40E+00	2,26E+02	4,39E+01	2,60E+00	ND	ND	ND	ND	ND	ND	ND	2,60E+00	1,25E+01	6,02E+00	1,60E+01	-3,28E+01
Human toxicity, cancer	CTUh	2,67E-08	9,51E-10	6,53E-10	2,83E-08	4,13E-09	3,71E-10	ND	ND	ND	ND	ND	ND	ND	3,71E-10	9,97E-10	7,87E-10	9,18E-10	-2,79E-09
Human tox. non-cancer	CTUh	2,08E-07	5,15E-08	1,46E-08	2,74E-07	2,41E-07	5,87E-09	ND	ND	ND	ND	ND	ND	ND	5,87E-09	5,61E-08	2,77E-08	3,06E-08	-9,41E-08
SQP[7)]	-	2,93E+02	7,90E+01	8,22E+00	3,80E+02	3,75E+02	3,30E+00	ND	ND	ND	ND	ND	ND	ND	3,30E+00	8,34E+01	1,29E+01	8,70E+01	-1,02E+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 energy[8)]	MJ	6,53E+01	1,11E+00	5,60E+01	1,22E+02	6,07E+00	2,99E-01	ND	ND	ND	ND	ND	ND	ND	2,99E-01	1,19E+00	1,22E+00	8,82E-01	-1,13E+01
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	6,53E+01	1,11E+00	5,60E+01	1,22E+02	6,07E+00	2,99E-01	ND	ND	ND	ND	ND	ND	ND	2,99E-01	1,19E+00	1,22E+00	8,82E-01	-1,13E+01
Non-re. PER as energy	MJ	5,31E+02	8,27E+01	6,95E+01	6,83E+02	3,73E+02	4,72E+01	ND	ND	ND	ND	ND	ND	ND	4,72E+01	8,70E+01	6,74E+01	7,90E+01	-1,33E+02
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	5,31E+02	8,27E+01	6,95E+01	6,83E+02	3,73E+02	4,72E+01	ND	ND	ND	ND	ND	ND	ND	4,72E+01	8,70E+01	6,74E+01	7,90E+01	-1,33E+02
Secondary materials	kg	2,57E+01	3,58E-02	2,66E-02	2,57E+01	1,61E-01	1,96E-02	ND	ND	ND	ND	ND	ND	ND	1,96E-02	3,73E-02	3,15E-02	2,90E-02	2,07E+00
Renew. secondary fuels	MJ	8,96E+01	4,28E-04	6,85E-05	8,96E+01	2,03E-03	5,12E-05	ND	ND	ND	ND	ND	ND	ND	5,12E-05	4,74E-04	3,17E-04	3,61E-04	-1,07E-03
Non-ren. secondary fuels	MJ	1,22E+02	0,00E+00	0,00E+00	1,22E+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	m^3	5,97E-01	1,21E-02	8,06E-03	6,18E-01	5,50E-02	3,12E-03	ND	ND	ND	ND	ND	ND	ND	3,12E-03	1,27E-02	6,49E-03	3,78E-02	-2,96E-01

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	3,43E+00	1,39E-01	1,21E-01	3,70E+00	5,39E-01	5,25E-02	ND	ND	ND	ND	ND	ND	ND	5,25E-02	1,48E-01	9,88E-02	1,11E-01	-2,06E+00
Non-hazardous waste	kg	2,45E+01	2,53E+00	2,15E+00	2,92E+01	1,08E+01	7,15E-01	ND	ND	ND	ND	ND	ND	ND	7,15E-01	2,74E+00	1,99E+00	2,17E+00	-2,36E+01
Radioactive waste	kg	4,88E-03	1,72E-05	7,36E-05	4,97E-03	1,11E-04	5,12E-06	ND	ND	ND	ND	ND	ND	ND	5,12E-06	1,84E-05	1,64E-05	1,33E-05	-1,26E-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	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
Materials for recycling	kg	2,73E-01	0,00E+00	2,05E+01	2,08E+01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,01E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	2,09E-04	0,00E+00	0,00E+00	2,09E-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	3,98E-03	0,00E+00	0,00E+00	3,98E-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

Scenario information	Value
Scenario assumptions e.g. transportation	50 km by lorry

Transport scenario documentation - A4 (Transport resources)
1. Transport, freight, lorry >32 metric ton, EURO6, 240.0 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	100
Bulk density of transported products	1,00E+00
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation resources)
1. Diesel, burned in building machine, Ecoinvent, 10.0 kWh

Use stages scenario documentation - C1-C4 (Data source)
1. Treatment of scrap steel, inert material landfill, Ecoinvent, 2.55 kg
2. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 14.45 kg
3. Treatment of waste reinforced concrete, recycling, Ecoinvent, Materials for recycling, 786.4 kg
4. Treatment of waste reinforced concrete, collection for final disposal, Ecoinvent, 196.6 kg
5. Diesel, burned in building machine, Ecoinvent, 10.0 kWh

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 15802+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: 27 March 2025 - 26 March 2028

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

VERIFIED ISO 14025