ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Heda Hybridbjälklag
Hedareds Sand & Betong AB

EPD HUB, HUB-5910
Published on 04.04.2026, last updated on 04.04.2026, valid until 04.04.2031

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	Hedareds Sand & Betong AB
Address	Älvsgården 2 504 92 Hedared Sweden
Contact details	hedared@heda.se
Website	www.heda.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-A5, and modules C1-C4, D
EPD author	Mattias Gustafsson
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	Heda Hybridbjälklag
Additional labels	HHB
Product reference	-
Place(s) of raw material origin	Sweden
Place of production	Hedared, Sweden
Place(s) of installation and use	Sweden
Period for data	November 2024 - October 2025
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	99,9

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne
Declared unit mass	1000 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	95,6
GWP-total, A1-A3 ($kgCO_2e$)	-69,5
Secondary material, inputs (%)	4,89
Secondary material, outputs (%)	82,4
Total energy use, A1-A3 (kWh)	-521
Net freshwater use, A1-A3 (m^3)	4,46

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Hedareds Sand & Betong AB is a family-owned concrete manufacturing company that started in 1952 in Hedared Sweden. Today the production takes place in two factories located in Hedared and Bollebygd, and all aggregates used are taken from our own quarries nearby. Heda manufactures prefabricated concrete elements such as balconies, slabs and pillars for apartment, office or industrial buildings as well as block and foundation products.

PRODUCT DESCRIPTION

Product Name and Specification

The declared product, Heda Hybridbjälklag is a prefabricated Timber-Concrete Composite (TCC) slab.

Intended Area of Application

The TCC slabs are designed to be used as load-bearing structural elements, primarily as intermediate floors in residential, commercial, and public buildings.

Technical and Functional Characteristics

The product combines the tensile strength and lightweight properties of sawn timber with the compressive strength and acoustic mass of concrete. The main raw materials are Portland cement, aggregates, reinforcing steel, spruce or pine timber, additives, and water. Any other raw materials account for less than 1% of the total mass.
Concrete strength class: C40/50.

Unambiguous Identification & Test Standards

The prefabricated elements are designed, detailed, and executed in accordance with SIS-CEN/TS 19103:2022 (Design of timber-concrete composite structures). The structural design further complies with the general assumptions of the Eurocodes, intended to be used in conjunction with:

- EN 1990: Basis of structural design
- EN 1991: Actions on structures
- EN 1992: Design of concrete structures
- EN 1995: Design of timber structures

Reference Service Life (RSL)

The design service life of the structural elements is dependent on the client's specific requirements and the building category, typically specified as either 50 or 100 years in accordance with EN 1990 for quasi-constant environmental conditions. As the use stage (Modules B1-B7) is not declared in this EPD, a formal mathematical RSL is not applied in the LCA calculations, but the physical durability of the product supports the aforementioned design lives.

Further information can be found at:

www.heda.se

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	1,52	Sweden
Minerals	87,39	Sweden
Fossil materials	-	-
Bio-based materials	11,09	Sweden

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	49,5
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne
Mass per declared unit	1000 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	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 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.

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

Manufacturing Process

The manufacturing of a timber-concrete composite slab begins with the preparation of the casting bed, which will house the mould of the element. After the mould is built, reinforcement is put into place, after which the timber is fastened. When the reinforcement and timber are in place and all quality checks are done, wet concrete is poured into the mould and left to cure until it has reached the right consistency for surface treatment. After the surfaces have been worked, the cast is left to cure. After curing, the elements are moved to the storage yard, ready for delivery.

Transport Assumptions for Materials (A2)

Transport distances for raw materials from the suppliers to the manufacturing site are exact distances calculated using the Google Maps API. Whenever possible, manufacturer-specific EPDs have been utilized for the input materials to ensure high data accuracy.

Production Losses and Manufacturing Waste (A3)

Production losses are closely monitored and minimized in the factory.
Concrete & Timber: A 0% waste rate is applied for timber, as it is engineered and ordered to exact lengths. Concrete waste is also considered to be 0%, as any surplus wet concrete from the casting process is repurposed and cast into interlocking concrete blocks for secondary use.
Steel: A conservative waste rate of 10% is applied to reinforcement steel. This assumption is based on 5 years of primary data comparing purchased steel quantities against sold steel scrap. While the actual historical waste is approximately 8%, 10% has been chosen to provide a conservative margin. 95% of this manufacturing scrap is assumed to be collected and diverted to recycling.

Energy Sources Profile

The manufacturing process relies on electricity and thermal energy.
Electricity: 100% of the electricity consumed is purchased with Guarantees of Origin (GO) for fossil-free production, specifically 100% nuclear power. This electricity powers machinery such as concrete mixers, cranes, and vibrators.
Thermal Energy: Heat required for the concrete curing process and facility heating is primarily supplied by renewable HVO100 diesel, with a small fraction of light fuel oil.

Packaging and Ancillary Materials

No packaging materials are used for the final product, as the elements are delivered as-is. Ancillary materials with an impact below the 1% cut-off limit, such as form oil, are excluded from the assessment.

Transport of Manufacturing Waste

The transportation distance for manufacturing waste (steel scrap) a conservative distance of 100 km is applied to ensure a conservative assessment and to align with industry guidelines from Svensk Betong.
The use of green energy in manufacturing is 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.

Tranportation

The prefabricated concrete elements are loaded on to wooden beams and transported to the construction site. After delivery the wooden beams are returned to the factory. The transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as 200 km and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 80 %. These values may vary, but the impacts of the transportation emissions in the results are so small that the variety can be assumed to be negligible. Empty returns are considered as it is assumed that return trips are normally not used by the transportation company to serve the needs of other clients. Transportation does not cause losses as products are secured properly.

Installation and Material Loss

The prefabricated elements are delivered ready-made from the factory to the exact specifications of the project, which eliminates the need for on-site adjustments such as cutting or drilling. Consequently, material loss during installation is assumed to be 0% (negligible). As no packaging materials are used for the delivery there is no packaging waste generated at the construction site.

Assumptions for A5 Waste Treatment and Transport

Since production loss during installation is 0% and no packaging is used, the total amount of waste to be treated in module A5 is zero. Therefore, no environmental impacts from waste transport or waste treatment are reported for the installation phase. This assumption is based on the standardized delivery and installation process for prefabricated timber-concrete composite elements where all components are pre-assembled.

Installation

Installation includes the energy use of the crane needed to install the elements. Energy consumption for the installation of a prefabricated element mainly represents the energy necessary to lift the element in place. To estimate the energy consumption a crane with the power output of 88kW was used. One element takes 10 minutes to install, and weighs on average 3,4 tonnes. This gives an average energy use of 4,3kWh per declared unit.

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)

End-of-Life Scenarios (C1-C4)

The scenarios included for the End-of-Life stage are currently in use and represent the most likely and standard waste management practices in Sweden. At the end-of-life, in the demolition phase (C1), 100% of the waste is assumed to be collected as separate construction waste. The demolition and waste processing take place at the building site and at regional waste treatment facilities in Sweden. The demolition process (C1) consumes energy in the form of both electricity and diesel used by various construction equipment, such as cranes and excavators. Energy consumption of a demolition process is on average 10 kWh/tonne and another 2 kWh/tonne for crushing the concrete and separating the rebar and timber (IVL, 2015).

The crushed concrete and separated rebar is delivered to the nearest construction waste treatment plant (C2). It is estimated that there is no mass loss during the use of the product and therefore the end-of-life product is assumed to have the same mass as the declared product. Transportation distance to the closest waste treatment is estimated to 100 km and the transportation method is assumed to be lorry as it is the most common.

At the waste treatment plant (C3), waste that can be reused, recycled, or recovered for energy is separated and diverted for further use. About 95% of steel (World Steel Association, 2020) and 80% of concrete (Betoniteollisuus ry, 2020) are recycled. The timber is incinerated for heat and electricity production. The process losses of the waste treatment plant are assumed to be negligible. The remaining 20% of concrete and 5% of steel are assumed to be sent to landfill (C4).

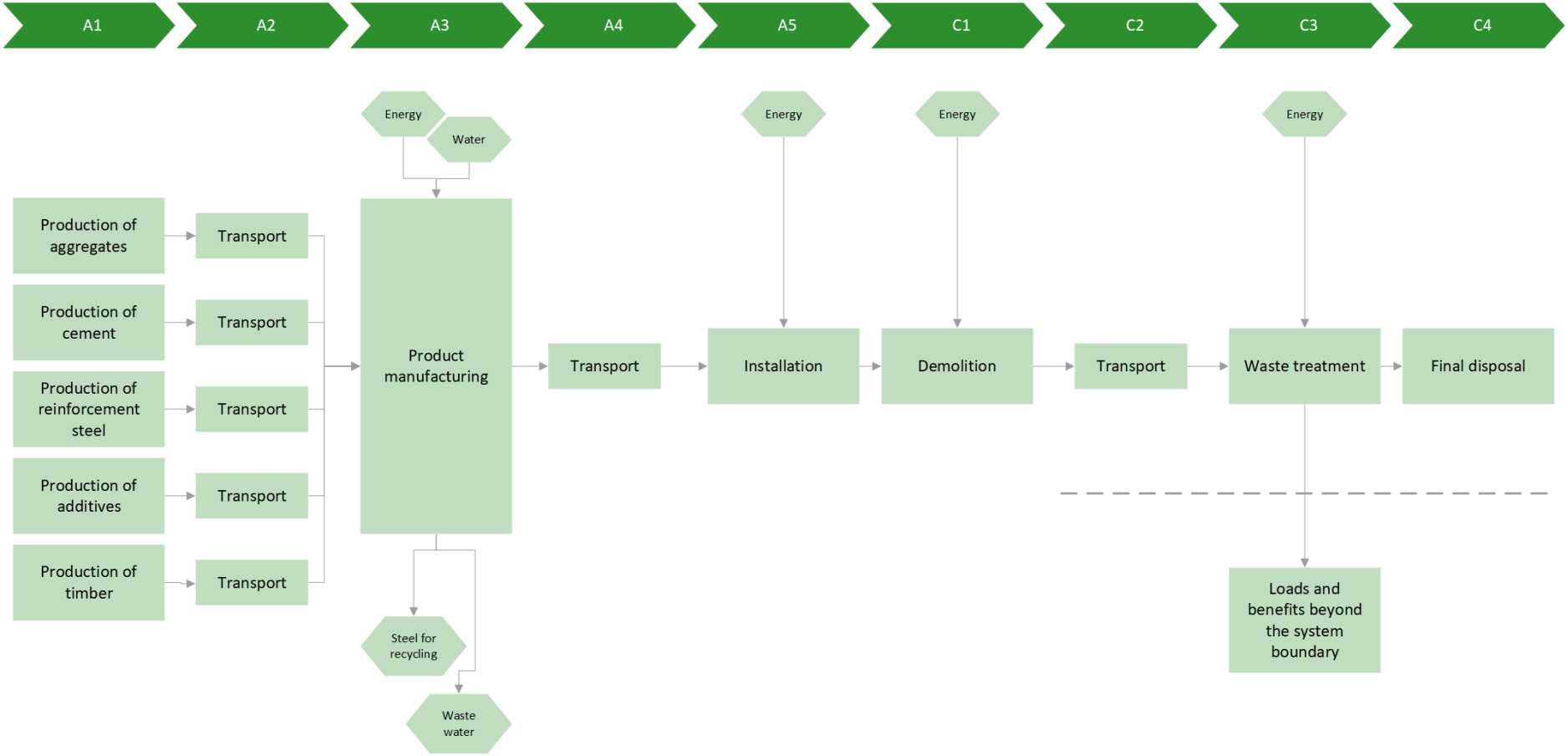
Benefits and Loads Beyond the System Boundary (Module D)

Module D includes the benefits and loads from the recycling of steel and concrete, as well as the energy recovery from timber. No packaging materials are included in Module D as no packaging is used for the product. The system boundary for Module D is defined as the point where the material has reached an "end-of-waste" state and can substitute primary materials or energy. The benefits are calculated based on the net output flow (the amount of recycled material at EoL minus the recycled content used in the production phase/A1), ensuring no double counting of environmental benefits occurs in accordance with EN 15804+A2.

Substituted processes in Module D include:

- Recycled steel replaces primary steel production (World Steel/Ecoinvent, reference year 2024).
- Recycled concrete (crushed aggregate) replaces the extraction of virgin natural aggregates (Ecoinvent, reference year 2024).
- The incineration of timber generates heat and electricity, which is assumed to substitute the average Swedish district heating mix and the Swedish electricity grid mix (Reference year 2024).

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.

The formwork process has been excluded from this assessment. The primary formwork consists of large steel frames that are reused extensively over several years and are considered part of the manufacturing infrastructure. Additionally, minor amounts of plywood are used to complement the steel frames during the casting process. As the consumed plywood accounts for less than 0.002% of the total mass of the product, it falls well below the 1% cut-off criteria and has consequently been excluded from the study.

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.

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	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	-

This EPD is product and factory specific.

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'.

Module Specific References (A1-A5)

Drivkraft Sverige (2024): Energiinnehåll, densitet och koldioxidemission. Used for LHV and emission factors for HVO100 and light fuel oil.
Google Maps API (2025): Used for calculating exact transportation distances for raw materials in Module A2.

End-of-Life and Waste Scenarios (C1-D)

IVL Swedish Environmental Research Institute (2015): Energy and resource use for demolition processes. Reference for 10 kWh/tonne demolition energy (C1) and 2 kWh/tonne crushing energy (C3).
World Steel Association (2020): Steel and the circular economy. Reference for the 95% recycling rate for reinforcement steel.
Betoniteollisuus ry (2020): Environmental Product Declarations for Concrete. Reference for the 80% recycling/recovery rate for concrete in Northern Europe.

Emission Factors and Background Data

IPCC (2006): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy. Table 2.3 for default emission factors for stationary combustion.
EMEP/EEA (2023): Air pollutant emission inventory guidebook. Table 3-4 for Tier 1 emission factors for industrial combustion (NOx, CO, SO2, NMVOC, PM).
Ecoinvent /3.10.1: Background database used for upstream processes and substituted materials in Module D.

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	-9,99E+01	7,99E+00	2,23E+01	-6,95E+01	2,07E+01	1,27E-01	ND	ND	ND	ND	ND	ND	ND	4,33E+00	1,04E+01	1,84E+02	3,96E+00	1,63E+02
GWP – fossil	kg CO_2e	7,85E+01	7,98E+00	9,14E+00	9,56E+01	2,07E+01	1,09E-01	ND	ND	ND	ND	ND	ND	ND	4,33E+00	1,04E+01	5,71E+00	3,95E+00	-3,28E-01
GWP – biogenic	kg CO_2e	-1,78E+02	1,32E-03	1,31E+01	-1,65E+02	4,52E-03	2,42E-03	ND	ND	ND	ND	ND	ND	ND	4,41E-04	2,45E-03	1,79E+02	-9,37E-04	1,63E+02
GWP – LULUC	kg CO_2e	1,16E-01	3,22E-03	8,44E-02	2,03E-01	8,05E-03	1,53E-02	ND	ND	ND	ND	ND	ND	ND	4,43E-04	4,84E-03	3,54E-03	8,24E-03	-2,11E-03
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	2,38E-06	1,64E-07	1,41E-07	2,68E-06	4,32E-07	3,23E-09	ND	ND	ND	ND	ND	ND	ND	6,62E-08	1,67E-07	7,08E-08	7,80E-08	-5,52E-09
Acidification potential	mol H^+e	4,64E+00	2,82E-02	1,13E-01	4,78E+00	4,88E-02	6,13E-04	ND	ND	ND	ND	ND	ND	ND	3,90E-02	2,64E-02	4,43E-02	2,44E-02	1,72E-03
EP-freshwater[2)]	kg Pe	1,54E-03	5,45E-04	8,09E-04	2,90E-03	1,45E-03	3,93E-05	ND	ND	ND	ND	ND	ND	ND	1,25E-04	8,33E-04	8,04E-04	2,81E-04	2,91E-04
EP-marine	kg Ne	1,55E-01	7,05E-03	5,61E-02	2,18E-01	1,28E-02	1,83E-04	ND	ND	ND	ND	ND	ND	ND	1,81E-02	6,70E-03	1,83E-02	9,92E-03	4,15E-03
EP-terrestrial	mol Ne	1,56E+00	7,70E-02	5,86E-01	2,22E+00	1,39E-01	1,68E-03	ND	ND	ND	ND	ND	ND	ND	1,98E-01	7,25E-02	1,99E-01	1,08E-01	3,04E-02
POCP ("smog")[3)]	kg NMVOCe	5,04E+00	3,84E-02	1,57E-01	5,23E+00	8,49E-02	4,22E-04	ND	ND	ND	ND	ND	ND	ND	5,91E-02	4,00E-02	5,94E-02	3,59E-02	5,10E-03
ADP-minerals & metals[4)]	kg Sbe	1,50E-04	2,22E-05	2,76E-02	2,78E-02	5,92E-05	2,54E-06	ND	ND	ND	ND	ND	ND	ND	1,55E-06	3,00E-05	3,16E-06	8,64E-06	-5,41E-06
ADP-fossil resources	MJ	5,80E+02	1,19E+02	9,46E+02	1,64E+03	3,11E+02	1,80E+01	ND	ND	ND	ND	ND	ND	ND	5,66E+01	1,56E+02	7,28E+01	6,67E+01	-1,19E+01
Water use[5)]	m^3e depr.	9,49E+03	5,99E-01	2,15E+01	9,51E+03	1,59E+00	9,91E-01	ND	ND	ND	ND	ND	ND	ND	1,41E-01	7,70E-01	5,11E-01	2,51E-01	3,28E+00

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get 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	9,80E-05	7,52E-07	1,73E-06	1,01E-04	2,02E-06	1,06E-08	ND	ND	ND	ND	ND	ND	ND	1,11E-06	1,02E-06	6,30E-06	1,89E-06	-1,31E-07
Ionizing radiation[6)]	kBq U235e	5,43E+00	1,40E-01	4,68E+01	5,24E+01	3,74E-01	1,31E+00	ND	ND	ND	ND	ND	ND	ND	2,51E-02	1,36E-01	1,88E-01	4,70E-02	-1,70E-01
Ecotoxicity (freshwater)	CTUe	5,34E+02	1,38E+01	1,02E+01	5,58E+02	3,66E+01	9,65E-01	ND	ND	ND	ND	ND	ND	ND	3,12E+00	2,19E+01	6,85E+00	1,41E+01	6,84E+00
Human toxicity, cancer	CTUh	8,26E-07	1,35E-09	6,48E-10	8,28E-07	3,44E-09	1,01E-10	ND	ND	ND	ND	ND	ND	ND	4,45E-10	1,73E-09	6,55E-10	7,89E-10	2,60E-09
Human tox. non-cancer	CTUh	1,07E-06	7,49E-08	2,87E-08	1,17E-06	2,01E-07	3,14E-09	ND	ND	ND	ND	ND	ND	ND	7,04E-09	1,01E-07	1,70E-08	2,68E-08	2,01E-07
SQP[7)]	-	1,67E+04	1,15E+02	1,31E+02	1,69E+04	3,13E+02	3,84E+00	ND	ND	ND	ND	ND	ND	ND	3,97E+00	1,57E+02	7,03E+00	7,68E+01	-3,96E+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[8)]	MJ	8,63E+02	1,90E+00	-4,55E+03	-3,68E+03	5,06E+00	1,23E+01	ND	ND	ND	ND	ND	ND	ND	3,58E-01	2,14E+00	2,86E+00	7,63E-01	-1,88E+03
Renew. PER as material	MJ	1,89E+03	0,00E+00	0,00E+00	1,89E+03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,89E+03	0,00E+00	1,88E+03
Total use of renew. PER	MJ	2,75E+03	1,90E+00	-4,55E+03	-1,80E+03	5,06E+00	1,23E+01	ND	ND	ND	ND	ND	ND	ND	3,58E-01	2,14E+00	-1,89E+03	7,63E-01	-1,62E+00
Non-re. PER as energy	MJ	5,44E+02	1,19E+02	8,48E+02	1,51E+03	3,11E+02	1,80E+01	ND	ND	ND	ND	ND	ND	ND	5,66E+01	1,56E+02	7,28E+01	6,67E+01	-1,19E+01
Non-re. PER as material	MJ	1,72E+01	0,00E+00	0,00E+00	1,72E+01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,72E+01	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	5,61E+02	1,19E+02	8,48E+02	1,53E+03	3,11E+02	1,80E+01	ND	ND	ND	ND	ND	ND	ND	5,66E+01	1,56E+02	5,56E+01	6,67E+01	-1,19E+01
Secondary materials	kg	4,89E+01	5,20E-02	1,93E-02	4,90E+01	1,34E-01	2,15E-03	ND	ND	ND	ND	ND	ND	ND	2,35E-02	6,63E-02	2,94E-02	2,42E-02	-3,11E-01
Renew. secondary fuels	MJ	4,24E+01	6,27E-04	1,86E-02	4,24E+01	1,69E-03	6,89E-06	ND	ND	ND	ND	ND	ND	ND	6,14E-05	8,44E-04	7,10E-05	3,17E-04	-6,47E-05
Non-ren. secondary fuels	MJ	2,55E+02	0,00E+00	0,00E+00	2,55E+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	4,24E+00	1,72E-02	1,97E-01	4,46E+00	4,58E-02	2,34E-02	ND	ND	ND	ND	ND	ND	ND	3,74E-03	2,35E-02	1,31E-02	3,31E-02	-9,60E-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	9,48E-02	1,72E-01	2,60E-01	5,28E-01	4,49E-01	1,28E-02	ND	ND	ND	ND	ND	ND	ND	6,30E-02	2,63E-01	2,23E-01	9,47E-02	7,10E-01
Non-hazardous waste	kg	5,97E+00	3,40E+00	5,98E+00	1,54E+01	9,00E+00	2,52E-01	ND	ND	ND	ND	ND	ND	ND	8,59E-01	4,87E+00	4,22E+00	1,83E+00	1,11E+02
Radioactive waste	kg	2,90E-02	3,46E-05	1,07E-02	3,97E-02	9,26E-05	2,80E-04	ND	ND	ND	ND	ND	ND	ND	6,15E-06	3,32E-05	4,57E-05	1,15E-05	-4,20E-05

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	1,22E+00	0,00E+00	0,00E+00	1,22E+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	1,13E+00	0,00E+00	1,44E+00	2,58E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	7,14E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	3,44E-01	0,00E+00	5,88E+00	6,22E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,11E+02	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	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

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	7,86E+01	7,99E+00	9,22E+00	9,58E+01	2,07E+01	1,25E-01	ND	ND	ND	ND	ND	ND	ND	4,33E+00	1,04E+01	5,71E+00	3,96E+00	-3,30E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Hydrotreated vegetable oil (HVO) biodiesel from used cooking oil (2020), Rest-of-Europe, ProBas, 0.0102 kgCO2e/MJ
2. Market for light fuel oil, Albania, Ecoinvent, 0.93 kgCO2e/kg
3. Electricity production, nuclear, pressure water reactor, Sweden, Ecoinvent, 0.0071 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO6, 200 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	40
Bulk density of transported products	5,11E+02
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation resources)

1. Market for electricity, medium voltage, Ecoinvent, 4.3 kWh

End-of-life scenario documentation - C1-C4 (Data source)

1. Market for diesel, burned in building machine, Ecoinvent, 12.0 kWh
2. Treatment of waste reinforcement steel, recycling, Ecoinvent, Materials for recycling, 14.44 kg
3. Treatment of waste concrete, not reinforced, recycling, Ecoinvent, Materials for recycling, 699.136 kg
4. Wood chipping, industrial residual wood, stationary electric chipper, Ecoinvent, Materials for energy recovery, 110.88 kg
5. Direct emission to air: Carbon dioxide, non-fossil, One Click LCA, 180.072 kg
6. Treatment of waste concrete, not reinforced, collection for final disposal, Ecoinvent, 174.784 kg
7. Treatment of waste reinforcement steel, collection for final disposal, Ecoinvent, 0.76 kg

Scenario information	Value
Scenario assumptions e.g. transportation	A transport distance of 100km is assumed

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: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
04.04.2026

VERIFIED ISO 14025