ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Polyethylene pressure pipe for geothermal energy systems

Muovitech AB

EPD HUB, HUB-4599

Published on 05.12.2025, last updated on 05.12.2025, valid until 05.12.2030

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	Muovitech AB
Address	Tvinnargatan 11, 507 30 Brämhult, Sweden
Contact details	info@muovitech.com
Website	https//www.muovitech.com/

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
Sector	Manufactured 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	Kajsa Jansson, MuoviTech AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Sarah Curpen

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	Polyethylene pressure pipe
Additional labels	PE-pipes, groud loop collector
Product reference	HDPE, Ø16-630mm, SDR26-SDR9
Place(s) of raw material origin	Germany, Belgium
Place of production	Finland, Sweden, United Kingdom, Poland
Place(s) of installation and use	Europe
Period for data	2023.01.01 – 2023.12.31
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3 (%)	-1% to +35%
GTIN (Global Trade Item Number)	N/A
NOBB (Norwegian Building Product Database)	N/A
A1-A3 Specific data (%)	6,84

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of MuoviTech pressure pipe made from 100% PE
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	2,04E+00
GWP-total, A1-A3 ($kgCO_2e$)	1,99E+00
Secondary material, inputs (%)	0
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	9,57
Net freshwater use, A1-A3 (m^3)	0,04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Muovitech is a leading European manufacturer specializing in innovative solutions for geothermal energy systems. Founded in Sweden, Muovitech operates globally with production facilities in multiple countries, offering high-quality products such as manifold chambers, collector pipes, and geoenergy accessories. The company is committed to sustainability, delivering energy-efficient solutions that reduce environmental impact and support the transition to renewable energy. With a focus on innovation, reliability, and customer service, Muovitech continues to set the standard in the geoenergy industry.

PRODUCT DESCRIPTION

MuoviTech pressure pipes are manufactured from high-quality HDPE (PE100/PE100 RC/PE80) and are designed for demanding applications in geothermal energy, water supply and other pressure pipe systems. The product range covers outside diameters from 16 mm up to 630 mm, with SDR classes from SDR26 to SDR9, corresponding to a wide range of pressure ratings (PN).

All pipes comply with the European standard EN 12201 for plastic piping systems for water supply and for pressure sewerage and fulfil the requirements of the Nordic Insta-Cert certification system.

The expected service life is at least 50 years under normal operating conditions. After use, the material is 100% recyclable.

Further information can be found at:
https//www.muovitech.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	
Minerals	0	
Fossil materials	100	EU
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	0,0145

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of MuoviTech pressure pipe made from 100% PE
Mass per declared unit	1 kg
Functional unit	N/A
Reference service life	50 years

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

Modules not declared = ND. 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.

A location-based approach is used in modelling the electricity mix utilized in the factory. 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, energy and fuels used by machines, and handling of waste generated in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during manufacturing as well as losses during electricity transmission.

Muovitech's pressure pipes are solely made from HDPE granulates, sourced as virgin material. The raw materials are transported by truck to the manufacturing facility, where the pressure pipes are extruded in different diameters. Measures are taken to optimize energy use and minimize emissions during production. In this EPD, a location-based approach has been applied for modeling electricity consumption. The finished products are typically packaged in plastic film and reuseable EPAL wooden pallets, with efforts to reduce material use and waste. The pipe ends are protected with plastic lids to minimize contamination entering the piping system during transport and installation. Depending on the length and dimensions of the pipes, different packaging methods may be used. The pipes can be delivered either as coils or as stacked bundles in standard lengths (6 or 12 meters) or in project-specified lengths. Origins used in this model refer to the locations where the components are produced.

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 average transport distance from the production plant to the construction site is assumed to be 357.61 km, using a lorry for land transport and a ferry for water transport. No material losses occur during transportation because the products are properly packed, and there is no loss of product or packaging during this stage.

For installation (A5), the pipes are produced according to customer orders and therefore custom-made in the correct dimensions and lengths, which means no material waste occurs during installation. The installation process can be quite resource-intensive since the pipes form part of an underground system, requiring significant excavation and backfilling depending on the size of the project. Pipe placement is carried out manually, and a small amount of energy is consumed for heat welding to connect the pipes with other system components. No additional materials are required for installation.

The packaging waste is disposed of at the installation stage and, in this EPD, is modeled using predefined datasets with generic data representing the average EU scenario for each material type, from the installation site to its treatment at the waste facility.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase (B1-B7).
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1: Demolition/deconstruction

The product is part of an underground piping system, and dismantling would require significant effort and resources due to its buried installation. In practice, the system is not dismantled at end-of-life; instead, it remains in place. For the LCA model, C1 is assumed to involve manual dismantling with negligible energy use, which is reflected in the results. This approach aligns with the realistic scenario where buried components are not excavated because of cost, disruption, and practical challenges.

C2: Transport of waste

Since the product is not removed from the ground, there is no transport to a disposal site. The pipes remain at their original installation location, and therefore the transport distance is considered zero in the model.

C3: Waste Processing

At the end of life, the pressure pipes are assumed to be landfilled in the LCA model. This is a conservative assumption using landfill datasets to represent the environmental impact of permanent burial. While this does not mean the pipes are physically moved to a controlled landfill site, the modeling approach treats the in-ground condition as equivalent to landfill.

C4: Disposal

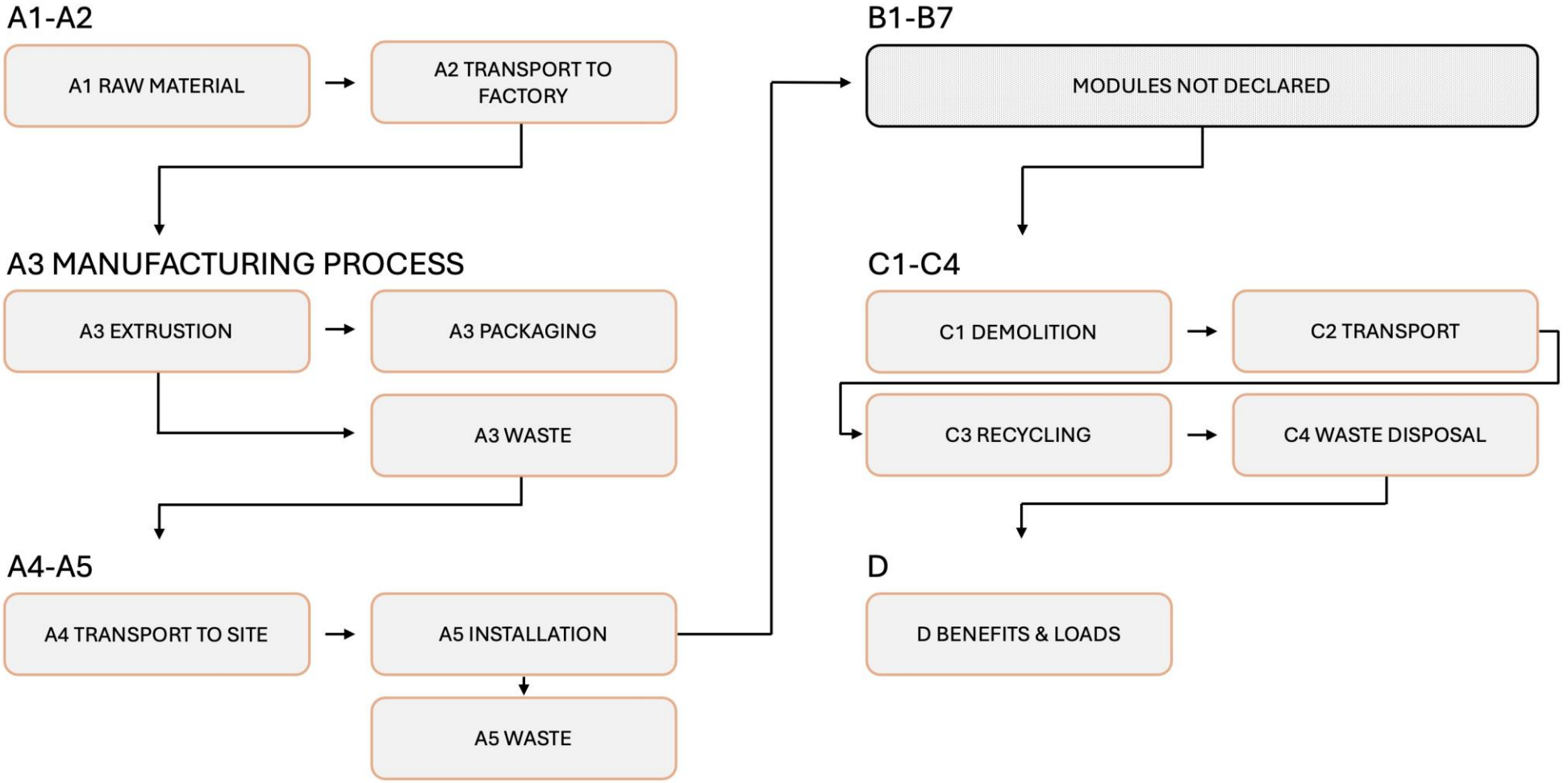
The product is considered disposed of under landfill conditions in the model. HDPE is non-biodegradable and inert, so its environmental impact in landfill is low, though it contributes to overall waste volume.

D: Reuse, Recovery, and Recycling Potential

No reuse, recycling, or energy recovery is modeled at end-of-life for raw materials. The pipes remain underground and are not excavated, reflecting a conservative and realistic scenario for subsurface infrastructure. While polyethylene is recyclable in principle, recovery is not assumed due to cost and feasibility.

Packaging waste generated during installation is modeled in Module D using predefined datasets with generic EU scenarios for each material type, covering transport from the installation site to waste treatment.

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.

End of life scenario is that the item is left to the ground, and no transportation is needed for the waste. The pipes are printed with brand name and meter markings etc. The ink as a raw material accounted for less then 1% of the declared unit and was excluded form 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	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple factories
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	-1% to +35%

This average EPD represents the manufacturing of MuoviTech's PE-pipes and ground loop collectors, produced at MuoviTech's production facilities in Finland, Sweden, Poland and the UK. The data were used to model pressure pipes from each production facility. The manufacturing process is largely consistent across all product dimensions and production facilities, as outlined

in this EPD. Differences primarily relate to electricity mix used at production facilities and transport distances of raw materials.

The EPD covers MuoviTech PE-pipes and ground loop collectors, manufactured from high-quality HDPE (PE100/PE100 RC/PE80). The product range includes pipes with outside diameters from 16 mm to 630 mm, with SDR classes from SDR26 to SDR9, corresponding to a wide range of pressure ratings (PN).

Manufacturing Plants and Production Volumes:

The products are manufactured at MuoviTech facilities in Finland, Sweden, Poland, and the UK, with the following annual production volumes in 2023: Sweden: 430 146 kg; Finland: 46 553 kg; Poland: 133 128 kg; UK: 78 077 kg

Representative Product Selection:

The Swedish production has been selected as the representative product for this average EPD. This choice reflects the production volumes in 2023.

Geographical Coverage:

The EPD covers products produced and distributed in the above-mentioned countries among other countries in Europe.

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. The EPD Generator uses Ecoinvent v3.10.1/3.11 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‘.

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	1,86E+00	1,14E-01	2,29E-02	1,99E+00	3,87E-02	6,75E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,51E-01	-1,50E-02
GWP – fossil	kg CO_2e	1,86E+00	1,14E-01	7,24E-02	2,04E+00	3,86E-02	6,22E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,51E-01	-1,74E-02
GWP – biogenic	kg CO_2e	-4,04E-05	2,46E-05	-5,23E-02	-5,24E-02	8,44E-06	5,30E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,96E-07	2,43E-03
GWP – LULUC	kg CO_2e	3,44E-06	4,46E-05	2,77E-03	2,81E-03	1,50E-05	1,91E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,99E-07	-1,61E-05
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	3,94E-10	2,36E-09	8,95E-09	1,17E-08	8,06E-10	8,99E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,45E-11	-5,56E-10
Acidification potential	mol H^+e	5,21E-03	3,36E-04	3,14E-04	5,86E-03	9,12E-05	5,39E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,63E-05	-7,69E-05
EP-freshwater[2)]	kg Pe	5,78E-05	7,86E-06	1,98E-05	8,54E-05	2,70E-06	2,01E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,41E-07	-6,22E-06
EP-marine	kg Ne	1,21E-03	8,74E-05	7,85E-05	1,38E-03	2,39E-05	2,51E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,06E-03	-1,26E-05
EP-terrestrial	mol Ne	1,31E-02	9,51E-04	7,74E-04	1,49E-02	2,59E-04	2,75E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,23E-04	-1,30E-04
POCP ("smog")[3)]	kg NMVOCe	6,30E-03	5,13E-04	3,15E-04	7,12E-03	1,59E-04	8,22E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,13E-04	-7,82E-05
ADP-minerals & metals[4)]	kg Sbe	1,84E-08	3,21E-07	6,04E-07	9,44E-07	1,11E-07	2,45E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,75E-09	-9,16E-08
ADP-fossil resources	MJ	7,80E+01	1,70E+00	4,71E+00	8,44E+01	5,80E-01	8,01E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,35E-02	-4,42E-01
Water use[5)]	m^3e depr.	0,00E+00	8,65E-03	1,96E-01	2,04E-01	2,97E-03	2,93E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,59E-04	-4,87E-03

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	6,22E-08	1,09E-08	4,15E-09	7,73E-08	3,77E-09	1,54E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,25E-09	-6,12E-10
Ionizing radiation[6)]	kBq U235e	6,55E-02	2,03E-03	1,42E+00	1,49E+00	6,99E-04	1,43E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,83E-05	-2,91E-03
Ecotoxicity (freshwater)	CTUe	1,36E+01	1,99E-01	8,57E-01	1,47E+01	6,84E-02	4,50E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,29E-01	-3,64E-02
Human toxicity, cancer	CTUh	2,18E-10	1,91E-11	3,56E-10	5,93E-10	6,44E-12	6,36E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,68E-12	-3,44E-12
Human tox. non-cancer	CTUh	5,51E-09	1,09E-09	8,97E-10	7,50E-09	3,75E-10	1,05E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,66E-10	-1,39E-10
SQP[7)]	-	5,62E-01	1,69E+00	5,06E+00	7,30E+00	5,84E-01	5,73E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,12E-01	-6,71E-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	7,92E-01	2,75E-02	2,55E+00	3,37E+00	9,45E-03	-3,05E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,05E-04	2,93E-02
Renew. PER as material	MJ	0,00E+00	0,00E+00	4,63E-01	4,63E-01	0,00E+00	-4,63E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,51E-02
Total use of renew. PER	MJ	7,92E-01	2,75E-02	3,01E+00	3,83E+00	9,45E-03	-7,68E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,05E-04	4,44E-02
Non-re. PER as energy	MJ	2,66E+01	1,70E+00	2,77E+00	3,11E+01	5,80E-01	7,43E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-3,07E+01	-4,42E-01
Non-re. PER as material	MJ	4,93E+01	0,00E+00	-7,77E-01	4,85E+01	0,00E+00	-7,05E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,78E+01	1,95E-01
Total use of non-re. PER	MJ	7,59E+01	1,70E+00	2,00E+00	7,96E+01	5,80E-01	6,73E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-7,85E+01	-2,47E-01
Secondary materials	kg	0,00E+00	7,37E-04	2,38E-03	3,11E-03	2,51E-04	3,29E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,66E-05	4,59E-03
Renew. secondary fuels	MJ	0,00E+00	9,16E-06	1,59E-02	1,59E-02	3,17E-06	8,84E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,91E-08	-4,37E-07
Non-ren. secondary fuels	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
Use of net fresh water	m^3	3,29E-02	2,49E-04	5,29E-03	3,84E-02	8,57E-05	6,49E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	4,21E-06	-1,58E-04

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	9,59E-04	2,46E-03	7,42E-03	1,08E-02	8,40E-04	9,19E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,11E-05	-8,92E-04
Non-hazardous waste	kg	1,32E-03	4,90E-02	2,07E-01	2,57E-01	1,68E-02	2,24E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,00E+00	-1,14E-01
Radioactive waste	kg	0,00E+00	5,02E-07	5,07E-05	5,12E-05	1,73E-07	3,16E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,96E-09	-7,45E-07

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	0,00E+00	0,00E+00	3,10E-02	3,10E-02	0,00E+00	1,55E-02	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	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	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E-01	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	5,70E-02	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	7,70E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,81E+00	1,13E-01	7,47E-02	2,00E+00	3,84E-02	6,19E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,43E-01	-1,72E-02
Ozone depletion Pot.	kg CFC_{-11}e	3,94E-10	1,88E-09	8,81E-09	1,11E-08	6,41E-10	7,16E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	5,91E-11	-4,53E-10
Acidification	kg SO_2e	4,24E-03	2,67E-04	2,52E-04	4,76E-03	7,23E-05	3,79E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,31E-05	-6,47E-05
Eutrophication	kg PO_4^3e	1,22E-03	5,86E-05	5,33E-04	1,82E-03	1,81E-05	8,94E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	7,17E-05	-1,95E-05
POCP (“smog”)	kg C_2H_4e	6,44E-04	2,42E-05	3,55E-05	7,04E-04	7,37E-06	2,85E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	2,99E-05	-6,14E-06
ADP-elements	kg Sbe	1,84E-08	3,14E-07	5,92E-07	9,24E-07	1,08E-07	2,38E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,70E-09	-9,04E-08
ADP-fossil	MJ	7,80E+01	1,67E+00	1,57E+00	8,13E+01	5,69E-01	7,81E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	6,31E-02	-3,91E-01

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	1,86E+00	1,14E-01	7,52E-02	2,05E+00	3,87E-02	6,22E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,51E-01	-1,74E-02

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

Manufacturing energy scenario documentation, Swedish production facility

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage; Sweden; Ecoinvent 3.10.1
Electricity CO2e / kWh	0.0295 kg CO2e / kWh
District heating data source and quality	-
District heating CO2e / kWh	-

Manufacturing energy scenario documentation, Polish production facility

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage; Poland; Ecoinvent 3.11
Electricity CO2e / kWh	0.96 kg CO2e / kWh
District heating data source and quality	-
District heating CO2e / kWh	-

Manufacturing energy scenario documentation, Finnish production facility

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage; Finland; Ecoinvent 3.10.1
Electricity CO2e / kWh	0.14 kg CO2e / kWh
District heating data source and quality	-
District heating CO2e / kWh	-

Manufacturing energy scenario documentation, production facility in the UK

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage; United Kingdom; Ecoinvent 3.10.1
Electricity CO2e / kWh	0.25 kg CO2e / kWh
District heating data source and quality	-
District heating CO2e / kWh	-

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	Market for transport, freight, lorry >32 metric ton, EURO6
Average transport distance, km	357,61
Capacity utilization (including empty return) %	50
Bulk density of transported products	-
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation resources)

1. Market for electricity, medium voltage, Ecoinvent, 0.0357 kWh
2. Market for diesel, burned in building machine, Ecoinvent, 5.98 MJ

Installation scenario documentation - A5 (Installation waste)

1. Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling, 0.0098 kg
2. Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 0.0092 kg
3. Exported Energy: Electricity, Ecoinvent, 0.021 MJ
4. Exported Energy: Electricity, Ecoinvent, 0.036 MJ
5. Exported Energy: Thermal, Ecoinvent, 0.028 MJ
6. Exported Energy: Thermal, Ecoinvent, 0.049 MJ
7. Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 0.012 kg
8. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.0057 kg
9. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 0.0053 kg
10. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.0033 kg

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

1. Treatment of waste plastic, mixture, unsanitary landfill, dry infiltration class (100mm), Ecoinvent, 1.0 kg

Scenario information	Value
Scenario assumptions e.g. transportation	End of life scenario is that the item is left to the ground, and no transportation is needed for the waste.

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

Sarah Curpen as an authorized verifier for EPD Hub Limited 05.12.2025