



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Robust PE100RC
Pipelife Finland Oy



EPD HUB, HUB-6775

Published on 24.06.2026, last updated on 24.06.2026, valid until 23.06.2031

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	Pipelife Finland Oy
Address	Kiviharjunlenkki 1 E, 90220, Oulu, Finland
Contact details	asiakaspalvelu@pipelife.fi
Website	https://www.pipelife.fi/

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	Rakennustuote
Category of EPD	Kolmannen osapuolen varmentama ympäristötuoteseloste
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Petteri Kesonen Pipelife Finland Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Elma Avdyli 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	Robust PE100RC
Additional labels	-
Product reference	-
Place(s) of raw material origin	Finland, EU
Place of production	Pipelife Hafab Oy
Place(s) of installation and use	Finland
Period for data	Calender year 2024
Averaging in EPD	Useita tuotteita
Variation in GWP-fossil for A1-A3 (%)	0
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	29

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of pipe
Declared unit mass	1 kg
Mass of packaging	0,02474 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	2,8
GWP-total, A1-A3 (kgCO ₂ e)	2,76
Secondary material, inputs (%)	0
Secondary material, outputs (%)	23,6
Total energy use, A1-A3 (kWh)	10,6
Net freshwater use, A1-A3 (m ³)	0,05

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Pipelife Finland Oy is one of Finland's leading manufacturers of HVAC products. The product range includes pipe and well products, network accessories, stormwater management systems, oil separators, pumping stations, electrical installation and cable protection products and intelligent SmartHub solutions. Through us, you can find complete solutions for the construction of water supply networks, building and municipal engineering, and industrial needs. The main raw material in the products is various plastic materials. We also operate as a contract manufacturer of plastic products for many industries.

Pipelife Finland Oy's head office is located in Oulu. In addition to sales, the head office also houses customer service, marketing, financial administration and product information management. Our factories are located along highways in Haparanda, Ii, Jyväskylä, Joensuu, Tampere and Vantaa. You will also find the southern sales, CEO and human resources in Vantaa. The locations of the factories offer us the opportunity to be close to our key markets and serve our customers quickly and in a timely manner.

Pipelife Finland Oy employs approximately 250 people in Finland, of which approximately 90 work at the subsidiary Talokaivo. Pipelife is owned by the world's largest brick manufacturer Wienerberger, which sells water and energy solutions under the Pipelife brand globally in 24 countries. As an international operator, Pipelife has access to the material, product and manufacturing expertise of a leading HVAC product manufacturer.

PRODUCT DESCRIPTION

Pipelife Robust RC is a new generation pressure pipe with a protective jacket.

The product is suitable for building and renovating networks.

Pipelife Robust RC™ is a pressure pipe equipped with a removable protective jacket. Robust RC pipes are used as pressurized water mains, pressure sewers, gas pipes, and for industrial process water in both land and underwater installations.

The flow pipe of Robust RC is made from durable PE100 RC material, which withstands stress caused by point loads without cracking. The protective jacket is made of polypropylene (PP) plastic. It shields the flow pipe from external stress during installation and from surface loads in the installation soil, ensuring a long service life. Compared to PE plastic, the hard and tough polypropylene (PP) provides excellent protection for the flow pipe against external forces.

Robust RC is ideally suited for trenchless installation methods, such as horizontal and directional drilling, as well as pipe bursting and long slip-lining. Connections can be made using electrofusion fittings, butt welding, or mechanical couplings.

Robust RC is available in sizes DNØ63–250; the protective jacket is not included in the dimension measurement. Products are supplied in straight lengths, coils, and reels. The identification colors of the protective jacket are blue (for pressurized water) and brown (for wastewater).

Robust RC pipes have drinking water approval, the Nordic Poly Mark quality label, and meet the requirements of the EN12201 standard.

More information:

<https://catalog.pipelife.com/fi/articlelist/robust-pe100rc-suojakuorelliset-paineputket-181160/176589/pe100rc-s-1w-sdr17-black-insblue-robustline>

Further information can be found at:

<https://www.pipelife.fi/>

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PRODUCT RAW MATERIAL MAIN COMPOSITION

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

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0,029

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of pipe
Mass per declared unit	1 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 materials (A1)

The first module includes extraction and production of raw materials used in manufacturing process, mainly polyethylene granulates and polypropylene granulates, as well as additives used in small amounts. Environmental impact for production of packaging materials and auxiliary materials are also included in this module.

Transport for manufacturing materials (A2)

Transport distances of materials to manufacturing site was modelled taking account location of suppliers and transportation routes.. Raw materials are transported by lorry and by boat. The transport distance for raw materials are (PE) 2241,2km by boat from Supplier to closest harbour, then 41km by lorry from harbour to factory. PP material is transported by lorry 717km. Packaging materials and auxiliary tools are transported by lorry on the road, distances for packaging materials are

The production method is a pipe extrusion. The different stages are:

- Material conveying: The raw material is delivered by container and unloaded into silos at the product manufacturing site.
- Extrusion (melting and processing of material): The extruder converts plastic raw material into a continuous tubular form by squeezing it through an annular nozzle.
- Cooling: The melted pipe passes through sizing or calibration benches (which adjust the dimensions of the pipe) into a vacuum cooling tank, which cools the pipe to its shape. There are usually two other cooling tanks to cool the pipe.
- Printing: The laser stamping machine marks pipes according to the used material, pipe size, diameter, length and produced batch number
- Cutting: The pipes are cut to the required length or coiled. The length of the pipes is usually 0,25 - 6 metres.

- Packaging: The pipes are packed in a wooden frame, which is tied down with plastic straps. The coils are tied with plastic straps. (PET).
- Dispatch: After the final quality check, the products are sent to the ordered destination.

The plastic waste generated in production is recycled within the factory, and the wastewater is sent to the wastewater treatment plant. (A3)
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.

A4: Based on sales figures, the average transport distance from the production plant to the building site is estimated to be 470 km, and the transport method is assumed to be a lorry. No losses occur during transport, as the products are properly packaged.

A5: The installation accounts for the treatment of packaging waste. The environmental impact of the installation on the building will be negligible.

Waste treatment assumptions:

- Wooden pallets: recycled 32%, incinerated 30%, landfilled 38%
- Plastic: recycled 40%, incinerated 37%, landfilled 23%

Transportation distances for waste treatment (EU average estimates):

- 50 km to landfill
- 150km to incineration
- 250km to recycling

The distance of waste transport is estimated to be typical in the EU. Waste management of packaging materials is based on EU statistical data

(<https://ec.europa.eu>).

Wood waste management of packaging materials is based on EU statistical data

(https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174/default/table?lang=en)

Plastic waste management of packaging materials is based on EU statistical data

(https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519242/default/table?lang=en)

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)

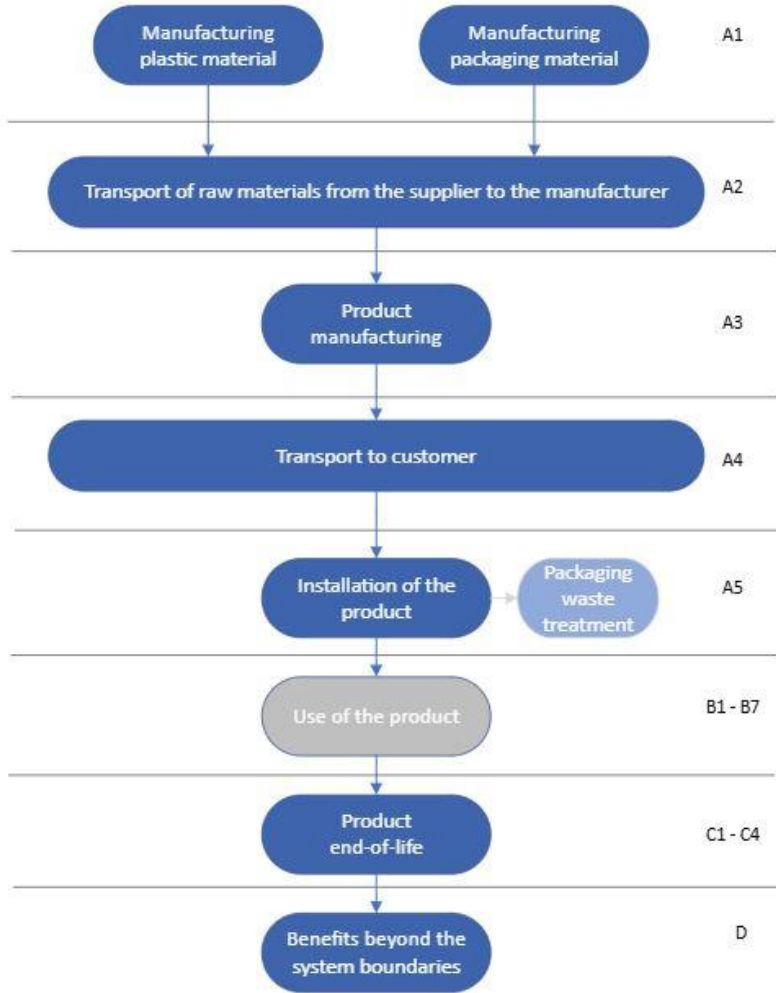
C1: Only the diesel fuel required for the work machine to dismantle a decommissioned product is taken into account in the calculation.. According to Plastic Europe 2020 scenario, 73% of the product is excavated and sent for recycling or incineration.

C2: The end-of-life product is assumed to be transported by truck to the nearest facility, over a distance of 50 km to 250 km, based on the scenario.

C4: According to scenario 27% of the product will go to landfill.

D: Due to the recycling and incineration potential of Polyethylene and Polypropylene, the end-of-life product is converted into the recycled PE and PP while energy and heat is produced from its incineration (D). The benefits and loads of waste packaging materials in A5 are also considered in module D.

SYSTEM DIAGRAM



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.

Colorant of the PP-granulate is excluded from this EPD hence its mass is <1% of the product.

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	Ei allokaatiota
Packaging material	Allokoitu massan tai tilavuuden mukaan
Ancillary materials	Allokoitu massan tai tilavuuden mukaan
Manufacturing energy and waste	Allokoitu massan tai tilavuuden mukaan

As supplier EPDs were not available for materials, generic datapoints from One Click LCA and Ecoinvent database were utilized for modelling.

Where primary data was not available for the installation and end-of-life stages, standardized Ready-made groups from One Click LCA were utilized. These scenarios are modeled based on:

A5 Packaging Waste: Treatment of packaging material (plastic and wood) is based on Eurostat and Debunking Efficient Recovery: The Performance of EU Incineration Facilities, 2023 average end of life scenarios for the European market. Transportation to waste processing sites is assumed to be 50 km by >32t EURO 6 lorry.

C3-C4 End-of-Life: The waste processing paths (Recycling, Incineration with energy recovery, and Landfill) have been modeled using the Plastics Europe 2020 average scenarios. This represents the current statistical distribution of plastic waste treatment in Europe to ensure the highest possible

geographical relevance.

2. Energy Consumption in Deconstruction (C1)

The energy demand for the deconstruction/demolition of the piping system (Module C1) is based on an assumption of diesel consumption from Bozdağ, Ö & Seçer, M. 2007. The consumption was estimated at 0.01 kWh per kg of installed pipe, representing the mechanical effort required for excavation and removal.

3. Transportation Assumptions (C2)

Transportation of waste from the deconstruction site to treatment facilities is based on a representative average distance of 50 km to landfill, 150 km to incineration and 250 km to recycling. The vehicle used is assumed to be a >32t EURO 5 lorry, utilizing average load factors provided by the One Click LCA database.

4. Cut-off and Allocation

Cut-off: No flows have been excluded that exceed 1% of the total mass or energy of the system. The total of neglected flows does not exceed 5% of the total impact.

Allocation: In the end-of-life stage, the benefits and loads from recycling and energy recovery are reported in Module D using the circular footprint formula approach, ensuring no double-counting of environmental benefits.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Useita tuotteita
Grouping method	Perustuu edustavaan tuotteeseen
Variation in GWP-fossil for A1-A3, %	0

EPD calculation is based on average. Calculation is per kg of pipe including in-house recycling. Packaging materials, consumed electricity, waste materials, water and transportation are calculated based on average value.

The production process is the same, the consumption of raw materials and electricity (energy) remains the same per kilogram of pipe -> variation 0. The result per kilo is the same regardless of the pipe size.

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.

Bozdağ, Ö & Seçer, M. 2007

Plastic Europe 2020 scenario

<https://zerowasteeurope.eu/wp-content/uploads/2023/01/Debunking-Efficient-Recovery-Full-Report-EN.docx.pdf>

https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519242/default/table?lang=en

https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174/default/table?lang=en

https://plasticseurope.org/wp-content/uploads/2021/10/BC_Table.pdf

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 ₂ e	1,97E+00	2,58E-01	5,35E-01	2,76E+00	5,19E-02	4,18E-02	ND	ND	ND	ND	ND	ND	ND	3,61E-03	1,59E-02	1,55E+00	3,21E-02	-1,21E+00
GWP – fossil	kg CO ₂ e	1,97E+00	2,58E-01	5,75E-01	2,80E+00	5,18E-02	1,25E-03	ND	ND	ND	ND	ND	ND	ND	3,60E-03	1,59E-02	1,55E+00	3,21E-02	-1,19E+00
GWP – biogenic	kg CO ₂ e	-4,14E-05	5,84E-05	-4,04E-02	-4,03E-02	1,17E-05	4,06E-02	ND	ND	ND	ND	ND	ND	ND	3,68E-07	3,61E-06	-2,62E-05	-1,69E-05	-1,10E-02
GWP – LULUC	kg CO ₂ e	3,68E-06	1,15E-04	2,65E-04	3,84E-04	2,32E-05	1,28E-06	ND	ND	ND	ND	ND	ND	ND	3,69E-07	7,13E-06	2,58E-05	1,96E-06	-1,15E-03
Ozone depletion pot.	kg CFC ₋₁₁ e	3,92E-10	3,81E-09	7,30E-09	1,15E-08	7,65E-10	1,39E-11	ND	ND	ND	ND	ND	ND	ND	5,52E-11	2,35E-10	3,10E-10	7,75E-11	-2,69E-08
Acidification potential	mol H ⁺ e	5,57E-03	8,79E-04	1,72E-03	8,17E-03	1,77E-04	4,71E-06	ND	ND	ND	ND	ND	ND	ND	3,25E-05	5,43E-05	2,54E-04	2,13E-05	-5,61E-03
EP-freshwater ²⁾	kg Pe	6,14E-05	2,01E-05	2,02E-04	2,83E-04	4,04E-06	2,25E-07	ND	ND	ND	ND	ND	ND	ND	1,04E-07	1,24E-06	5,98E-06	3,16E-07	-4,72E-04
EP-marine	kg Ne	1,29E-03	2,89E-04	3,99E-04	1,98E-03	5,81E-05	5,02E-06	ND	ND	ND	ND	ND	ND	ND	1,51E-05	1,78E-05	1,33E-04	7,09E-05	-8,92E-04
EP-terrestrial	mol Ne	1,40E-02	3,14E-03	4,03E-03	2,12E-02	6,32E-04	1,92E-05	ND	ND	ND	ND	ND	ND	ND	1,65E-04	1,94E-04	1,18E-03	8,69E-05	-9,12E-03
POCP (“smog”) ³⁾	kg NMVOCe	6,68E-03	1,30E-03	1,24E-03	9,22E-03	2,61E-04	6,30E-06	ND	ND	ND	ND	ND	ND	ND	4,93E-05	8,01E-05	3,03E-04	3,78E-05	-4,60E-03
ADP-minerals & metals ⁴⁾	kg Sbe	2,56E-08	7,19E-07	6,31E-07	1,38E-06	1,45E-07	2,34E-09	ND	ND	ND	ND	ND	ND	ND	1,29E-09	4,44E-08	1,80E-07	6,75E-09	-5,30E-06
ADP-fossil resources	MJ	8,31E+01	3,74E+00	8,67E+00	9,55E+01	7,52E-01	1,20E-02	ND	ND	ND	ND	ND	ND	ND	4,72E-02	2,31E-01	2,65E-01	6,66E-02	-2,72E+01
Water use ⁵⁾	m ³ e depr.	0,00E+00	1,85E-02	6,86E-02	8,71E-02	3,72E-03	3,30E-04	ND	ND	ND	ND	ND	ND	ND	1,18E-04	1,14E-03	4,06E-02	3,26E-04	-3,52E-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	6,66E-08	2,58E-08	8,77E-09	1,01E-07	5,19E-09	8,69E-11	ND	ND	ND	ND	ND	ND	ND	9,25E-10	1,59E-09	1,85E-09	4,82E-10	-4,48E-08
Ionizing radiation ⁶⁾	kBq I1235e	6,93E-02	3,26E-03	1,43E-01	2,16E-01	6,55E-04	3,14E-05	ND	ND	ND	ND	ND	ND	ND	2,09E-05	2,01E-04	1,19E-03	6,62E-05	-2,06E-01
Ecotoxicity (freshwater)	CTUe	1,46E+01	5,29E-01	1,02E+00	1,61E+01	1,06E-01	1,26E-02	ND	ND	ND	ND	ND	ND	ND	2,60E-03	3,27E-02	4,15E-01	9,92E-02	-5,33E+00
Human toxicity, cancer	CTUh	2,33E-10	4,26E-11	8,81E-11	3,63E-10	8,56E-12	4,55E-13	ND	ND	ND	ND	ND	ND	ND	3,71E-13	2,63E-12	6,25E-11	1,57E-12	-1,86E-10
Human tox. non-cancer	CTUh	5,90E-09	2,42E-09	4,58E-09	1,29E-08	4,87E-10	2,32E-11	ND	ND	ND	ND	ND	ND	ND	5,87E-12	1,50E-10	2,47E-09	3,09E-10	-8,97E-09
SQP ⁷⁾	-	5,97E-01	3,77E+00	6,61E+00	1,10E+01	7,58E-01	1,13E-02	ND	ND	ND	ND	ND	ND	ND	3,30E-03	2,33E-01	2,63E-01	1,55E-01	-4,80E+00

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	8,44E-01	5,13E-02	1,06E+00	1,96E+00	1,03E-02	-3,59E-01	ND	ND	ND	ND	ND	ND	ND	2,99E-04	3,17E-03	1,93E-02	1,04E-03	-2,21E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	3,02E-01	3,02E-01	0,00E+00	-3,02E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,80E-02
Total use of renew. PER	MJ	8,44E-01	5,13E-02	1,36E+00	2,26E+00	1,03E-02	-6,61E-01	ND	ND	ND	ND	ND	ND	ND	2,99E-04	3,17E-03	1,93E-02	1,04E-03	-2,11E+00
Non-re. PER as energy	MJ	2,83E+01	3,74E+00	4,36E+00	3,64E+01	7,52E-01	-2,27E-03	ND	ND	ND	ND	ND	ND	ND	4,72E-02	2,31E-01	-2,91E+01	-1,04E+01	-2,73E+01
Non-re. PER as material	MJ	5,26E+01	0,00E+00	-4,81E+00	4,78E+01	0,00E+00	-1,53E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-3,49E+01	-1,29E+01	9,88E+00
Total use of non-re. PER	MJ	8,09E+01	3,74E+00	-4,47E-01	8,42E+01	7,52E-01	-1,76E-02	ND	ND	ND	ND	ND	ND	ND	4,72E-02	2,31E-01	-6,40E+01	-2,33E+01	-1,74E+01
Secondary materials	kg	0,00E+00	1,59E-03	1,25E-03	2,84E-03	3,20E-04	8,29E-06	ND	ND	ND	ND	ND	ND	ND	1,96E-05	9,84E-05	1,01E-03	2,41E-05	2,47E-01
Renew. secondary fuels	MJ	0,00E+00	2,02E-05	2,02E-05	4,05E-05	4,07E-06	8,40E-08	ND	ND	ND	ND	ND	ND	ND	5,12E-08	1,25E-06	7,41E-06	4,52E-07	-2,51E-05
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	3,48E-02	5,53E-04	1,03E-02	4,57E-02	1,11E-04	-3,12E-05	ND	ND	ND	ND	ND	ND	ND	3,12E-06	3,42E-05	3,57E-04	-9,91E-04	-1,15E-02

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	1,13E-03	6,34E-03	5,67E-02	6,42E-02	1,27E-03	7,90E-05	ND	ND	ND	ND	ND	ND	ND	5,25E-05	3,92E-04	1,49E-02	1,17E-04	-7,46E-02
Non-hazardous waste	kg	1,45E-03	1,17E-01	1,05E+00	1,17E+00	2,36E-02	5,47E-02	ND	ND	ND	ND	ND	ND	ND	7,15E-04	7,25E-03	6,00E-01	1,33E+00	-4,37E+00
Radioactive waste	kg	0,00E+00	7,98E-07	3,32E-05	3,40E-05	1,60E-07	7,81E-09	ND	ND	ND	ND	ND	ND	ND	5,12E-09	4,93E-08	3,02E-07	1,62E-08	-5,26E-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	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	1,01E-01	1,01E-01	0,00E+00	7,94E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,36E-01	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	4,01E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	7,78E+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	1,69E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,28E+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	2,32E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	4,50E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	1,92E+00	2,56E-01	5,73E-01	2,75E+00	5,16E-02	1,79E-03	ND	ND	ND	ND	ND	ND	ND	3,59E-03	1,58E-02	1,55E+00	3,07E-02	-1,17E+00
Ozone depletion Pot.	kg CFC ₁₁ e	3,92E-10	3,04E-09	6,05E-09	9,48E-09	6,11E-10	1,12E-11	ND	ND	ND	ND	ND	ND	ND	4,37E-11	1,88E-10	2,61E-10	6,19E-11	-2,22E-08
Acidification	kg SO ₂ e	4,53E-03	6,71E-04	1,39E-03	6,60E-03	1,35E-04	3,50E-06	ND	ND	ND	ND	ND	ND	ND	2,29E-05	4,15E-05	1,82E-04	1,58E-05	-4,73E-03
Eutrophication	kg PO ₄ ³ e	1,31E-03	1,64E-04	2,46E-04	1,72E-03	3,29E-05	1,27E-06	ND	ND	ND	ND	ND	ND	ND	5,34E-06	1,01E-05	5,66E-05	1,03E-05	-1,10E-02
POCP (“smog”)	kg C ₂ H ₄ e	6,68E-04	5,98E-05	9,14E-05	8,20E-04	1,20E-05	4,03E-07	ND	ND	ND	ND	ND	ND	ND	1,71E-06	3,70E-06	1,34E-05	5,94E-06	-3,86E-04
ADP-elements	kg Sbe	2,56E-08	7,01E-07	6,24E-07	1,35E-06	1,41E-07	2,25E-09	ND	ND	ND	ND	ND	ND	ND	1,26E-09	4,33E-08	1,70E-07	6,56E-09	-5,24E-06
ADP-fossil	MJ	8,31E+01	3,69E+00	6,46E+00	9,33E+01	7,42E-01	1,15E-02	ND	ND	ND	ND	ND	ND	ND	4,68E-02	2,28E-01	2,44E-01	6,55E-02	-2,36E+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 ₂ e	1,97E+00	2,58E-01	5,75E-01	2,80E+00	5,19E-02	1,25E-03	ND	ND	ND	ND	ND	ND	ND	3,61E-03	1,59E-02	1,55E+00	3,21E-02	-1,19E+00

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. Electricity, medium voltage, residual mix, Finland, Ecoinvent, 0.66 kgCO_{2e}/kWh

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO5, 470 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	100
Bulk density of transported products	8,13E+00
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation waste)

1. Exported Energy: Electricity, Ecoinvent, 9.0E-4 MJ
2. Exported Energy: Electricity, Ecoinvent, 0.016 MJ
3. Exported Energy: Thermal, Ecoinvent, 0.0012 MJ
4. Exported Energy: Thermal, Ecoinvent, 0.022 MJ
5. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Kierrätykseen tarkoitettut materiaalit, 1.4E-4 kg
6. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 1.3E-4 kg
7. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 8.3E-5 kg
8. Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Kierrätykseen tarkoitettut materiaalit, 0.0078 kg
9. Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 0.0073 kg
10. Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 0.0093 kg

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

1. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Kierrätykseen tarkoitettut materiaalit, 0.016 kg
2. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Kierrätykseen tarkoitettut materiaalit, 0.22 kg
3. Exported Energy: Thermal, Ecoinvent, 0.24 MJ
4. Exported Energy: Thermal, Ecoinvent, 4.26 MJ
5. Treatment of waste polypropylene, municipal incineration, Ecoinvent, 0.034 kg
6. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.018 kg
7. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.25 kg
8. Exported Energy: Electricity, Ecoinvent, 0.18 MJ
9. Exported Energy: Electricity, Ecoinvent, 3.097 MJ
10. Diesel, burned in building machine, Ecoinvent, 0.01 kWh
11. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 0.46 kg

Scenario information	Value
Scenario assumptions e.g. transportation	PP: 23% recycling, 50% incineration, 27% landfill. HPDE: 24% recycling, 49% incineration, 27% landfill)

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

Elma Avdyli as an authorized verifier for EPD Hub Limited 24.06.2026

