ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Solar pass-throughs
VILPE Oy

EPD HUB, HUB-5529

Published on 01.03.2026, last updated on 01.03.2026, valid until 01.03.2031

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	VILPE Oy
Address	Mustasaari, Finland
Contact details	sales@vilpe.com
Website	https://www.vilpe.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	Milja Sarapaa, VILPE Oy
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	Solar pass-throughs
Additional labels	-
Product reference	-
Place(s) of raw material origin	Finland, Belgium, Turkey, China
Place of production	Mustasaari, Finland
Place(s) of installation and use	Finland, Sweden, Poland, Lithuania, Estonia, Ukraine, Denmark, Latvia, Germany
Period for data	01/01/2024-31/12/2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	+6,8% / +15%
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	(coming soon)
A1-A3 Specific data (%)	4,61

ENVIRONMENTAL DATA SUMMARY

Declared unit	1kg
Declared unit mass	1kg
Mass of packaging	0,152kg
GWP-fossil, A1-A3 ($kgCO_2e$)	3,81
GWP-total, A1-A3 ($kgCO_2e$)	2,97
Secondary material, inputs (%)	3,66
Secondary material, outputs (%)	99,80
Total energy use, A1-A3 (kWh)	23,6
Net freshwater use, A1-A3 (m^3)	0,04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

VILPE Oy is a Finnish family-owned company that develops and manufactures ventilation and roofing solutions for the construction industry. The company's operations are based on customer-oriented and innovative product development.
Our high quality VILPE® products bring better indoor air quality, energy efficiency and longevity of structures to all spaces and thus improve people's quality of life. VILPE represents safe construction and living, which reinforces the company's commitment to quality and reliability.

PRODUCT DESCRIPTION

VILPE Solar pass-throughs provide a professional and secure solution to allow the pipelines of solar collectors and other small pipes, cables or electrical wires to be safely and discreetly passed through the roof. Solar pass-throughs include a pre-attached coupling ring as well as a flange, a cover and the screws needed for installation. They are available for felt, steel and tile roofing, and come in a wide range of colours. The cover of the Solar pass-through is detachable, which facilitates any service procedures which might need to be conducted on the pipes. The flange and the cover can also be turned sideways up to 90 degrees from the direction of the pipes. This facilitates the installation process and ensures that it is conducted safely.

Solar Tile Click Pass-through: The most common concrete tile roofings with tile width of 330 mm. Replaces one 2-wave concrete tile. Used for passing pipes and cables from solar panels and solar collectors through the roof covering. Rubber sealing for VILPE Solar pass-throughs, made of tough and flexible technical rubber material. Fully waterproof, and used to lead Ø 4–50 mm wires and cables through a roof. Attaches to a Solar pass-through with a weatherproof fastener.

Solar Unitile Click Pass-through: All tile roofings (ceramic, clay, concrete and special tiles, 1- and 2-wave tiles as well as plain tiles). Used for passing pipes and cables from solar panels and solar collectors through the roof covering. Rubber sealing for VILPE Solar pass-throughs, made of tough and flexible technical rubber material. Fully waterproof, and used to lead Ø 4–50 mm wires and cables through a roof. Attaches to a Solar pass-through with a weatherproof fastener.

Solar Profiled Steel Click Pass-through: For all round profiled metal sheet roofings (with roof tile pattern). Minimum length of tile pattern is 350 mm. Moldable and fully waterproof due to the rubber seal mounted on the lower surface. Used for passing pipes and cables from solar panels and solar collectors through the roof covering. Rubber sealing for VILPE Solar pass-throughs, made of tough and flexible technical rubber material. Fully waterproof, and used to lead Ø 4–50 mm wires and cables through a roof. Attaches to a Solar pass-through with a weatherproof fastener.

Solar Classic Click Pass-through: For plain standing seam roofings. Retrofittable. Thick rubber seal under the flange. Used for passing pipes and cables from solar panels and solar collectors through the roof covering. Rubber sealing for VILPE Solar pass-throughs, made of tough and flexible technical rubber material. Fully waterproof, and used to lead Ø 4–50 mm wires and cables through a roof. Attaches to a Solar pass-through with a weatherproof fastener.

Solar Steel Click Pass-through: Low profiled metal sheet roofing. Waterproof thanks to the rubber cone with the moldable aluminum flange. Used for passing pipes and cables from solar panels and solar collectors through the roof covering. Rubber sealing for VILPE Solar pass-throughs, made of tough and flexible technical rubber material. Fully waterproof, and used to lead Ø 4–50 mm wires and cables through a roof. Attaches to a Solar pass-through with a weatherproof fastener.

Solar Felt Tall Pass-through Set: Used for passing pipes and cables from solar panels and solar collectors through the roof covering. Suitable for bitumen membrane roofs when the roof pitch is less than 1:5 (11.5 degrees). Installation between two membrane layers. Rubber sealing for VILPE Solar pass-throughs, made of tough and flexible technical rubber material. Fully waterproof, and used to lead Ø 4–50 mm wires and cables through a roof. Attaches to a Solar pass-through with a weatherproof fastener.

VILPE Grip: The weight of solar panels and their mounting systems can press down on the roof surface, stressing the membrane and causing indentations where water can pool and lead to long-term damage. The VILPE Grip Support Anchor is specifically designed to prevent this by elevating solar panels and similar rooftop systems above the roof surface.
By transferring the weight directly to the roof's load-bearing structures, it removes pressure from the membrane and helps preserve the structural integrity of the roof. Unlike traditional surface-mounted supports, the VILPE solution offers generous adjustment tolerances, enabling faster, easier, and more forgiving installation. Engineered to perform in demanding weather conditions, it withstands heavy snow loads and strong winds—delivering lasting durability and reliable performance.

This is an EPD based on the averaging method, and Solar Classic Click Pass-through has been selected as the representative product because it is the most comparable in terms of its structure and the most significant in terms of sales volume. To ensure the permitted range of variation, four additional products were also selected for the calculation, representing different extremes in terms of product structure complexity and packaging size (VILPE Grip, Solar Unitile Click Pass-through, Solar Steel Click Pass-through, Solar Bulk). This ensured that the products are comparable with each other. The analysis concluded that all products fall within the same average range for A1–A3 Global Warming Potential (GWP).

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	8,16 %	China
Minerals	-	-
Fossil materials	91,84 %	Finland, Belgium, Turkey, China
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	0,234

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1kg
Mass per declared unit	1kg
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.

Solar pass-throughs by VILPE Oy are manufactured at the Mustasaari site in Finland. The transport distances and transport methods for raw materials have been obtained based on supplier questionnaires. The production process consists of raw material delivery, injection molding, assembly, quality inspection, and packaging. During injection molding, the raw material is plasticized, injected into the mold, cooled, and removed from the mold. In the assembly phase, plastic parts produced through injection molding are fitted together with purchased components. The product is then packed in a cardboard box together with accessories. Production losses or ancillary materials have not been considered, as their quantity is insignificant and their combined share is less than 1% relative to the product. Production requires electricity, heat, and water. Slightly less than 10% of the electricity comes from the production facility's own solar power plant, and the remainder is sourced from nuclear electricity. Waste heat from the machines is directed to a heat recovery center and used for building heating. Cooling water is circulated in a closed-loop system. Material requirements and the amount of waste generated vary depending on the size of the product. Production waste is recycled within the process for use in other products.

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

TRANSPORT AND INSTALLATION (A4-A5)

The average distribution distance has been calculated as a weighted average based on significant sales volumes. Products are transported on full pallets. During installation, the disposal of packaging material is included in the estimate. Solar pass-throughs are packed in cardboard boxes, and the amount

of packaging material varies slightly depending on the type and size of the solar pass-through. For packaging materials, it has been assumed that 82% of cardboard is recycled, 9% is incinerated, and 9% is sent to landfill. For wood, it is assumed that 31% is recycled, 31% is incinerated, and 38% is landfilled. The exact quantities are presented according to the treatment methods in the scenario table at the end of the EPD. It should be noted that the life cycle of the wooden pallet is assumed to end within the calculation, as the exact share of potential reuse could not be determined. After installation, the packaging material is transported by truck to a recycling facility. An average transport distance of 50 km by truck to a recycling facility in Finland has been used. Scenario estimates are based on average recycling methods and practices. No installation waste is generated from the product itself. No auxiliary materials or additional accessories are required during installation beyond those supplied with the product. Energy consumption during installation, mainly from the use of a drill, has been excluded from the calculations as it is assumed to be insignificant per examined product unit. This has, however, been presented in the scenario table at the end of the EPD.

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)

The end-of-life stage consists of the following modules:

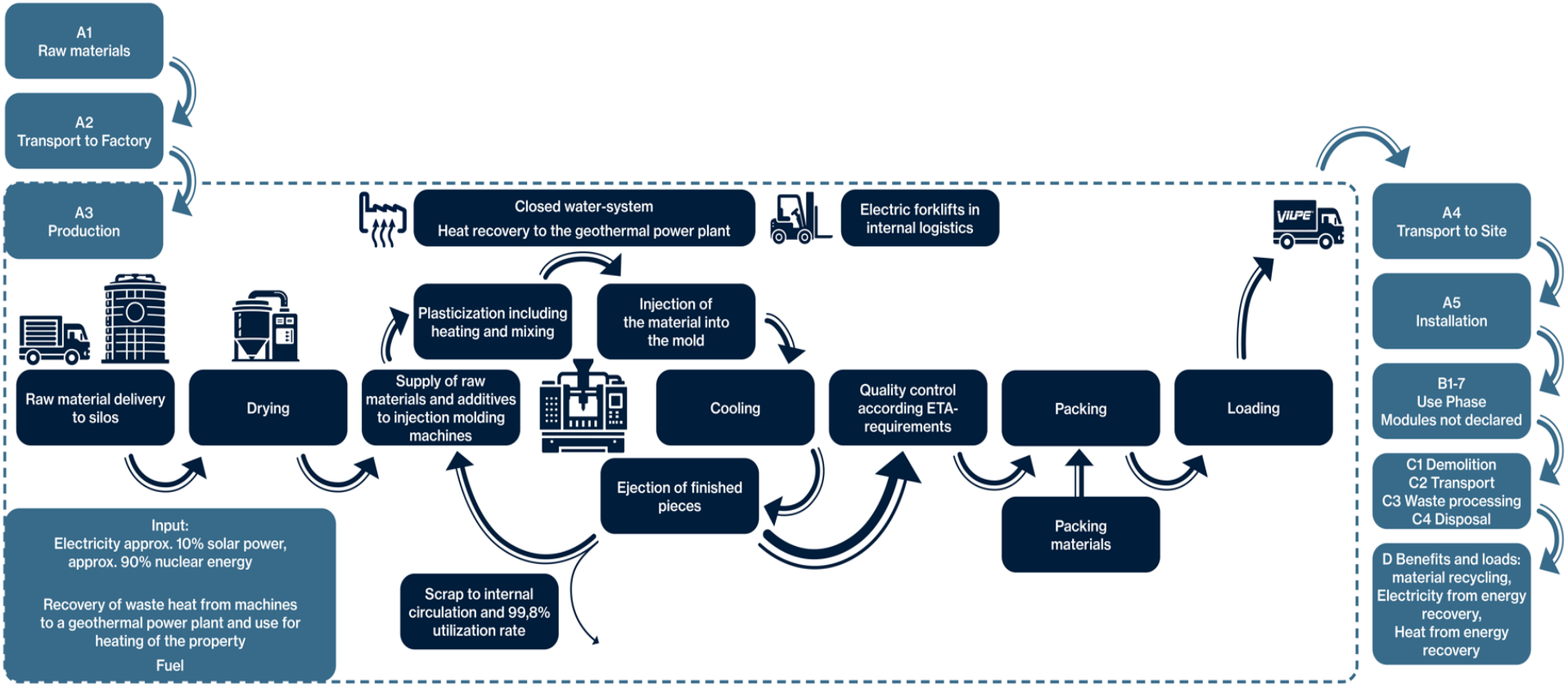
C1: Deconstruction of the product
C2: Transportation of the discarded product
C3: Waste processing
C4: Disposal

The EOL-scenario represents the most probable option in Finland and is based on local waste management scenarios. The average distance to waste treatment facilities in Finland has been used for waste transportation distance. At the end of its service life, the product can be dismantled from its installation environment. It is assumed in the calculation that the product is further disassembled into parts and the different waste fractions are processed separately. It is assumed that plastic and rubber waste (PP, TPE, EPDM) end up entirely in incineration (100%). For components made of steel, a treatment method of 95% recycling and 5% landfill is assumed (source: World Stainless 2024).

The benefits and loads of incineration and recycling are included in Module D. This covers loads from the incineration of plastic and rubber (PP, TPE EPDM) as well as benefits in the form of heat and electricity generated from incineration. For steel, loads include the recycling process. The benefit of steel recycling is avoiding primary steel production (recycled). The use of secondary material/recycled material (0.2 kg/kg) is not included in the calculations. For cardboard, loads include the recycling process (use of secondary materials/recycled material: 0.98 kg/kg is not included in the calculations) and the incineration process. Benefits include the use of secondary materials and heat and electricity from incineration. For wooden pallets, loads include the recycling process (use of secondary materials: 1.17 kg/unit, or 4.68%, is not included in the calculations) and the incineration process. Benefits include the use of secondary materials and heat and electricity from incineration. All assumptions follow current recycling practices in Finland (2025-2026).

All scenarios are based on the most likely option in Finland and scenarios included are currently in use and are representative for one of the most likely scenarios.

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.

Manufacturing waste is not included to calculations because total amount of plastic which goes to energy waste is only 400kg per year and less than 1% of plastic production. Since the combined amount of ancillary materials including added water to the closed system is less than 1% and no REACH chemicals have been used, they have been excluded from the calculation. More details in attachments. Energy consumption during the installation is very small (drilling machine) that it is not included to the calculations

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	Partly allocated by mass or volume
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 products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	+6,8% / +15%

The average was calculated for 14 similar products, and to ensure adequate precision in the range of variation, 5 products were selected for the analysis.

These products represent different size categories and the extremes in terms of packaging content scope. The product that most accurately reflected the average characteristics was designated as the representative product. The primary material is comparable across the products, with the most significant differences arising in size, weight, and packaging materials. The intended use of the products is consistent, aligning with the requirements of the averaging methodology. The transportable mass, including packaging materials, varies across the products due to differences in their dimensions. While the end-of-life stages are broadly similar, variations occur based on the quantity of packaging material, product size, and specific components included with the products. The analysis concluded that all products fall within the same average range for A1–A3 Global Warming Potential (GWP).

Representative product: Solar Classic Click Pass-through
Other products selected for the analysis: VILPE Grip, Solar Unitile Click Pass-through, Solar Steel Click Pass-through, Solar Bulk
A technical description of the average product group: mass of plastic products from plastic production when compared to the amount of purchased products (all products have similar intended use)

There are no geographical restrictions on the use of the EPD, provided that it is applied in the following or comparable countries: Finland, Sweden, Poland, Lithuania, Estonia, Ukraine, Denmark, Latvia, Germany. There is no any other restrictions to the use of the EPD due to averaging. The representativeness of the declared results and content has been approved, as the variation range in the GWP A1–A3 phases is 6.8%–15% and meets other criteria for averaging.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.3. 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 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‘.

Exported energy (thermal and electricity) from municipal incineration has been calculated according to Eriksson O. & Finnveden G. (2017). Steel treatment methods have been selected according to World Stainless (2024) and ICDA (2023).

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	3,35E+00	1,21E-01	-5,06E-01	2,97E+00	1,19E-01	8,72E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,36E-03	2,48E+00	0,00E+00	-1,86E-02
GWP – fossil	kg CO_2e	3,35E+00	1,21E-01	3,45E-01	3,81E+00	1,19E-01	1,39E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,36E-03	2,48E+00	0,00E+00	-3,12E-01
GWP – biogenic	kg CO_2e	2,54E-04	1,87E-05	-8,58E-01	-8,58E-01	2,50E-05	8,58E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E-06	-3,95E-05	0,00E+00	2,94E-01
GWP – LULUC	kg CO_2e	2,19E-03	5,93E-05	6,85E-03	9,10E-03	4,49E-05	8,17E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,01E-06	1,17E-05	0,00E+00	-1,03E-03
Ozone depletion pot.	kg CFC_{-11}e	7,06E-08	1,88E-09	7,66E-09	8,01E-08	2,39E-09	1,71E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,08E-10	4,25E-10	0,00E+00	-1,95E-08
Acidification potential	mol H^+e	1,21E-02	2,25E-03	1,87E-03	1,62E-02	4,07E-04	7,09E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,73E-05	3,47E-04	0,00E+00	-1,78E-02
EP-freshwater[2)]	kg Pe	8,92E-04	5,92E-06	1,28E-04	1,03E-03	7,99E-06	3,92E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,61E-07	5,31E-06	0,00E+00	-6,43E-04
EP-marine	kg Ne	2,36E-03	5,74E-04	7,36E-04	3,67E-03	1,36E-04	1,01E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,88E-06	1,57E-04	0,00E+00	-2,32E-03
EP-terrestrial	mol Ne	2,45E-02	6,36E-03	5,79E-03	3,67E-02	1,48E-03	2,74E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,39E-05	1,67E-03	0,00E+00	-2,46E-02
POCP ("smog")[3)]	kg NMVOCe	1,23E-02	1,82E-03	1,84E-03	1,59E-02	6,41E-04	9,20E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,82E-05	4,18E-04	0,00E+00	-8,45E-03
ADP-minerals & metals[4)]	kg Sbe	1,96E-05	2,09E-07	3,17E-06	2,30E-05	3,27E-07	4,99E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,48E-08	2,13E-07	0,00E+00	-2,26E-06
ADP-fossil resources	MJ	7,30E+01	1,60E+00	2,60E+01	1,01E+02	1,72E+00	1,54E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,76E-02	2,85E-01	0,00E+00	-2,78E+01
Water use[5)]	m^3e depr.	8,99E-01	6,10E-03	3,86E-01	1,29E+00	8,79E-03	7,50E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,98E-04	7,55E-02	0,00E+00	-9,41E-02

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	1,69E-07	7,14E-09	3,51E-08	2,11E-07	1,18E-08	1,15E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,33E-10	2,01E-09	0,00E+00	-3,23E-07
Ionizing radiation[6)]	kBq U235e	1,75E-01	1,14E-03	1,18E+00	1,36E+00	2,07E-03	5,68E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,36E-05	5,63E-04	0,00E+00	-1,02E-02
Ecotoxicity (freshwater)	CTUe	3,52E+01	1,60E-01	6,23E+00	4,16E+01	2,02E-01	6,65E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,15E-03	1,12E+00	0,00E+00	-3,97E+00
Human toxicity, cancer	CTUh	9,91E-10	2,34E-11	9,23E-10	1,94E-09	1,96E-11	8,11E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,82E-13	6,73E-11	0,00E+00	-3,75E-10
Human tox. non-cancer	CTUh	2,35E-08	6,86E-10	3,56E-09	2,77E-08	1,11E-09	5,12E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,04E-11	3,15E-09	0,00E+00	-1,25E-08
SQP[7)]	-	9,22E+00	8,05E-01	8,68E+01	9,68E+01	1,72E+00	1,77E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,82E-02	1,25E-01	0,00E+00	-3,78E+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	2,56E+00	1,75E-02	5,29E+00	7,86E+00	2,79E-02	-7,60E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,26E-03	1,25E-02	0,00E+00	-8,26E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	7,48E+00	7,48E+00	0,00E+00	-7,48E+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	2,56E+00	1,75E-02	1,28E+01	1,53E+01	2,79E-02	-1,51E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,26E-03	1,25E-02	0,00E+00	-8,26E+00
Non-re. PER as energy	MJ	5,10E+01	1,60E+00	2,56E+01	7,83E+01	1,72E+00	1,54E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,76E-02	-3,37E+01	0,00E+00	-6,18E+01
Non-re. PER as material	MJ	2,69E+01	0,00E+00	3,71E-01	2,72E+01	0,00E+00	-3,71E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-2,69E+01	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	7,79E+01	1,60E+00	2,60E+01	1,06E+02	1,72E+00	-2,17E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,76E-02	-6,06E+01	0,00E+00	-6,18E+01
Secondary materials	kg	3,66E-02	7,28E-04	1,67E-01	2,05E-01	7,45E-04	1,61E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,36E-05	4,37E-04	0,00E+00	5,64E-02
Renew. secondary fuels	MJ	3,29E-03	4,87E-06	1,60E-01	1,63E-01	9,35E-06	1,05E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,24E-07	4,91E-06	0,00E+00	-1,74E-03
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	2,73E-02	1,67E-04	8,68E-03	3,61E-02	2,53E-04	-5,84E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,15E-05	8,03E-04	0,00E+00	-3,43E-03

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	3,09E-01	2,31E-03	2,84E-02	3,40E-01	2,49E-03	1,79E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,12E-04	2,63E-02	0,00E+00	-1,67E-01
Non-hazardous waste	kg	1,05E+01	3,77E-02	5,40E-01	1,11E+01	4,98E-02	1,07E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,25E-03	9,80E-01	0,00E+00	-2,05E+00
Radioactive waste	kg	8,15E-05	2,79E-07	2,81E-04	3,62E-04	5,11E-07	1,36E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,32E-08	1,43E-07	0,00E+00	-2,52E-06

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	0,00E+00	0,00E+00	0,00E+00	2,61E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,00E-02	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	9,18E-01	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,05E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,96E+01	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	3,09E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,95E+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	1,74E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,67E+01	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_2e	3,32E+00	1,21E-01	3,54E-01	3,80E+00	1,18E-01	4,18E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,32E-03	2,48E+00	0,00E+00	-2,97E-01
Ozone depletion Pot.	kg $CFC_{-11}e$	5,88E-08	1,50E-09	6,59E-09	6,69E-08	1,90E-09	1,39E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,58E-11	3,66E-10	0,00E+00	-1,58E-08
Acidification	kg SO_2e	1,00E-02	1,79E-03	1,42E-03	1,32E-02	3,10E-04	5,29E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,31E-05	2,47E-04	0,00E+00	-1,53E-02
Eutrophication	kg $PO_4^{3}e$	6,21E-02	2,14E-04	4,28E-03	6,66E-02	7,53E-05	3,54E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,32E-06	7,56E-05	0,00E+00	-1,89E-03
POCP ("smog")	kg C_2H_4e	8,56E-04	9,41E-05	1,42E-04	1,09E-03	2,82E-05	1,01E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,23E-06	1,58E-05	0,00E+00	-9,76E-04
ADP-elements	kg Sbe	1,94E-05	2,05E-07	3,21E-06	2,28E-05	3,19E-07	4,80E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,44E-08	1,90E-07	0,00E+00	-2,25E-06
ADP-fossil	MJ	7,39E+01	1,58E+00	4,47E+00	8,00E+01	1,69E+00	1,45E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,61E-02	2,76E-01	0,00E+00	-2,76E+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	3,35E+00	1,21E-01	3,52E-01	3,82E+00	1,19E-01	1,40E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,36E-03	2,48E+00	0,00E+00	-3,13E-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

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, nuclear, pressure water reactor (Reference product: electricity, high voltage)
Electricity CO2e / kWh	0,0071 CO2e / kWh
District heating data source and quality	Heat production, light fuel oil, at boiler 100kW condensing, non-modulating (Reference product: heat, central or small-scale, other than natural gas)
District heating CO2e / kWh	0,0969 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, EURO5 and Transport, freight, sea, container ship
Average transport distance, km	746km
Capacity utilization (including empty return) %	50%
Bulk density of transported products	-
Volume capacity utilization factor	1

Installation scenario documentation A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	-
Water use / m³	-
Other resource use / kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	0,018 kWh
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Paperboard 0,152kg, EUR-Flat pallet/Wood 0,439kg
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	Cardboard: 82% recycling, 9% incineration, 9% landfill Wood: 31% recycling, 31% incineration, 38% landfill
Direct emissions to ambient air, soil and water / kg	-

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	-
Collection process – kg collected with mixed construction waste	1kg
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0,078kg
Recovery process – kg for energy recovery	0,919kg
Disposal (total) – kg for final deposition	0,004kg
Scenario assumptions e.g. transportation	Transported 50km by lorry "Market for transport, freight, lorry >32 metric ton, EURO5

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 01.03.2026

APPENDIX

PRODUCT PORTFOLIO INCLUDED IN SCOPE

The following list of products are included in the scope of declaration.

Product number	Product name
756542	VILPE Grip
756532, 756537	Solar Bulk
360202, 360209	Solar Tile Click Pass-through
360212, 360217, 36021D	Solar Classic Click Pass-through
360222	Solar Profiled Steel Click Pass-through
360232, 360239	Solar Unitile Click Pass-through
360252, 360254	Solar Steel Click Pass-through
75682	Solar Felt Tall Pass-through