ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

EPD HUB, HUB-4387
Published on 07.11.2025, last updated on 07.11.2025, valid until 06.11.2030

Vario Surface-mounted luminaire

Vario 1420 30W/840 ACMP DA2 WH
Airam Electric Oy Ab

This EPD is intended for business-to-business and/or business-to-consumer communication. 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. 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.

MANUFACTURER AND SITE

Manufacturer	Airam Electric Oy Ab
Address	Sementtitehtaankatu 6, 04260 Kerava, Finland
Contact details	asiakaspalvelu@airam.fi
Website	https://www.airam.fi
Place of production	Lahti, Finland
Place(s) of raw material origin	EU, Asia
Place(s) of installation and use	Finland
Period for data	2024

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 cPCR: EN 50693
Sector	Electrical product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, B6, and modules C1-C4, D
EPD author	Samuli Salonen, Airam Electric Oy Ab
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Sergio Ballen Zamora as an authorized verifier acting for EPD Hub Limited.

PRODUCT SPECIFICATION

Product name	Vario 1420 30W/840 ACMP DA2 WH
Product number / reference	4146889
GTIN (Global Trade Item Number)	6435200298829
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	73,3

PRODUCT CLASSIFICATION

Declared operating voltage, Volt	220-240
Light source color temperature, Kelvin	4000
Protection index for water and dust (IP)	IP20
Impact resistance index (IK)	IK02
Luminous flux, Lumen	3900
Electrical power, Watt	30
Luminous efficiency, Lm/W	130

PRODUCT DESCRIPTION

Developed and manufactured in Finland, Vario is a surface-mounted aluminium profile luminaire. The material used in the body is 100% recycled aluminium. Thanks to the variety of housing lengths and a wide range of corner pieces, you can create a customised lighting solution that meets your needs. Typical applications include offices, lobbies, educational institutions and corridors. With this luminaire, you can create a seamless line of light of up to 4,500 mm. The 100% Finnish Vario luminaires are designed and manufactured at Airam's factory in Lahti.

ABOUT THE MANUFACTURER

Airam Electric is a Finnish family-owned company established in Helsinki in 1921. We deliver locally designed lighting solutions for demanding professional markets. Our products combine innovative technology, robust durability, and energy efficiency while offering flexible, customizable options for offices, industrial facilities, and public environments. Locally tailored solutions, diverse installation methods and use of intelligent control systems ensure that our solutions meet unique project requirements.
Manufactured in our Lahti factory, Airam supports sustainable, locally based production with shorter lead times.

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of surface mounted Vario-luminaire (1420 mm)
Declared unit mass, kg	3,8801
Mass of packaging, kg	0,5273
Functional unit	3900 lm over 100 000 h (L80B50)
Reference service life (years)	15
Assigned lifetime (hours)	100000
GWP-total, A1-A3 (kg CO_2e)	2,33E+01
GWP-fossil, A1-A3 (kg CO_2e)	2,35E+01
Secondary material, inputs (%)	3,25
Secondary material, outputs (%)	60,8
Total energy use, A1-A3 (kWh)	134
Net freshwater use, A1-A3 (m^3)	2,37E-01

LIFE CYCLE ASSESSMENT

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	X	ND	X	X	X	X	X
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demo.	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling

Modules not declared = ND.

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. 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.

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

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 materials	No allocation
Ancillary materials	Allocated by mass
Manufacturing energy and waste	Allocated by mass

A3 – Manufacturing

Manufacturing at the Lahti factory includes sheet metal machining (punching, bending), aluminium and plastic profile cutting, and manual assembly. Scrap from machining and cutting is recycled; ancillary materials are negligible (cut-off). Production scrap (sheet metal, aluminium, plastics) is transported on average 50 km for recycling.

Energy use in manufacturing:

The manufacturing process at the Lahti factory uses two types of energy:

Electricity: 100% renewable 'Biosähkö' bioelectricity supplied by Keravan Energia Oy under a Guarantees of Origin (GO) contract.
Keravan Energia's 'Biosähkö' is produced entirely from sustainably sourced wood-based biomass, such as clean wood chips and other by-products of the Finnish forest industry.
The electricity is generated in a combined heat and power (CHP) process with an overall efficiency of approximately 80%, where both electricity and district heat are recovered from renewable fuels.
The applied emission factor is 0 g CO_2e/kWh, and a conservative +5% transmission loss is applied to account for high-voltage distribution.
Electricity is used to operate metal punching and bending machines, profile cutting equipment, lighting, and assembly tools.

District heating: 100% renewable heat, also supplied by Keravan Energia, produced from wood-based fuels in the same CHP plant.
Documented by a GO cancellation certificate (229 MWh, 2024).
District heating is used for space heating and domestic hot-water generation at the Lahti factory.

Both energy sources are fully renewable and locally produced within Finland.

A4 – Transport to site
Deliveries from the Lahti factory via wholesaler central warehouses to customers are modelled with an average distance of 180 km by >32 t lorry, EURO 5.

A5 – Installation
Luminaires are installed manually without energy or water use. Only packaging waste (cardboard and plastics) is generated and included in A5.

B1–B5 – Use stage (except energy)
No consumables, emissions, or replacements occur during service life. Declared as ND.

B6 – Operational energy use
The operational energy use of the declared luminaire is calculated according to the methodology of EN 15193-1:2017 + A1:2021 for lighting systems in buildings, in compliance with EN 15804+A2 and the EPD Hub Core Product Category Rules. The declared unit is a surface-mounted Vario luminaire (1420 mm) with a rated power of 30 W, equipped with a DALI-2 control gear.

Worst-case scenario (full power, no controls):

Assumes continuous operation without any energy-saving controls.

Annual operating hours: 2520 h/year (252 working days × 10 h/day).

Reference Service Life (RSL): 15 years.

Total energy consumption:
30 W × 2520 h/year × 15 years ÷ 1000 = 1134 kWh

Represents a conservative estimate for office or commercial use without dimming or sensing.

Optimized scenario with DALI-2 control (daylight and occupancy sensing):

DALI-2 enables integration with daylight harvesting and occupancy sensing (IEC 62386 compliant).

Energy savings potential: typically, 20–50% compared to the worst-case scenario, depending on daylight and occupancy.

Example assumption: daylight dependency factor FD = 0.7 and occupancy dependency factor FO = 0.8 (EN 15193-1:2017 + A1:2021).

Effective operating hours: 1764 h/year (2520 h × 0.7).

Total energy consumption:
30 W × 1764 h/year × 15 years ÷ 1000 = 794 kWh

This represents approx. 30% savings compared to the worst-case. Actual savings depend on site conditions (e.g., daylight, occupancy, sensor configuration).

B7 – Water use
Not applicable.

C1–C4 – End-of-life
Deconstruction is manual and negligible. Waste transport (C2) is modelled as 150 km by >32 t lorry (ecoinvent v3.10). Waste processing (C3) and disposal (C4) follow the default end-of-life scenarios of the Luminaire EPD Generator.

D – Benefits beyond system boundary
Substitution credits are applied for recycled aluminium, steel, plastics, and energy recovery, using conservative assumptions with quality losses.

PRODUCT & MANUFACTURING SITES GROUPING

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

This EPD is product and factory specific.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	86,9	EU
Minerals	0	
Fossil materials	9,1	EU
Bio-based materials	0	
Electronic parts	3,9	EU, Asia

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	0,255

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

LCA SOFTWARE AND BIBLIOGRAPHY

The LCA and EPD have been prepared according to the reference standards, EN 50693, and ISO 14040/14044. Ecoinvent v3.10.1/3.11 and One Click LCA databases were used 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'.

PRODUCT LIFE CYCLE

MANUFACTURING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production. The material losses occurring during the manufacturing processes are treated as per the waste handling practices in the factory, while scenario assumptions are made in the absence of exact data. The study also considers the fuels used by machines as well as losses during electricity transmission.
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.

The product is made of metals, plastics, and electronic components. All components are transported to the production facility, where the main manufacturing processes are associated with assembly of different parts and components. The finished product is packaged with polyethylene, cardboard, and/or paper as packaging material before being sent to customers.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation distances from manufacturing sites to customer locations are based on sales volume-based weighted averages. In the absence of exact data, conservative assumptions are made (A4). Environmental impacts from installation include waste packaging materials (A5). The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

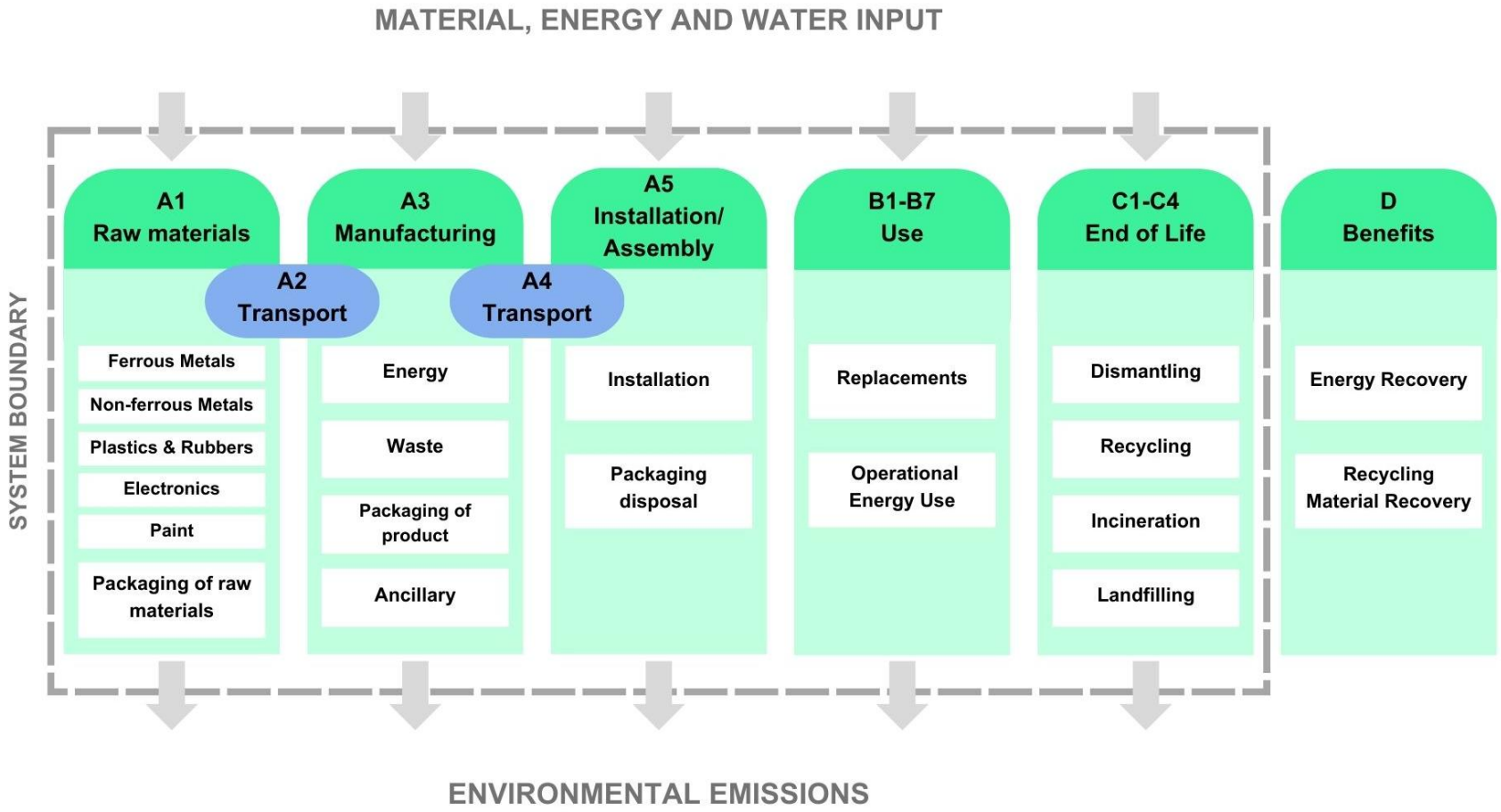
PRODUCT USE AND MAINTENANCE (B1-B7)

During the use phase, the product consumes electricity (B6). Impacts due to electricity production include direct emissions to air, transformation, and transmission losses.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment centre. The transport distance is 150 km while the transportation method is assumed to be lorry (C2). According to EN 50693:2019, the sequence of treatment operations occurring to the product shall include de-pollution, fractions separation and preparation (dismantling, crushing, shredding, sorting), recycling, other material recovery, energy recovery and disposal. In this study, the default values from table G.4 of EN 50693 is used for treating materials in different waste treatment methods. Due to the material and energy recovery potential of parts in the lighting system, the end-of-life product is converted into recycled raw materials, while the energy recovered from incineration displaces electricity and heat production (D). The benefits and loads of incineration and recycling are included in Module D.

SYSTEM DIAGRAM



ENVIRONMENTAL IMPACT DATA, RESULTS PER DECLARED UNIT

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	2,28E+01	2,55E-01	2,42E-01	2,33E+01	8,54E-02	9,42E-01	ND	ND	ND	ND	ND	1,76E+02	ND	0,00E+00	1,14E-01	3,82E-01	2,25E-01	1,25E+01
GWP – fossil	kg CO_2e	2,24E+01	2,54E-01	8,66E-01	2,35E+01	8,54E-02	1,49E-02	ND	ND	ND	ND	ND	1,72E+02	ND	0,00E+00	1,13E-01	3,82E-01	2,25E-01	-4,10E+01
GWP – biogenic	kg CO_2e	1,83E-01	5,11E-05	-6,31E-01	-4,48E-01	1,93E-05	9,27E-01	ND	ND	ND	ND	ND	6,29E-01	ND	0,00E+00	2,48E-05	-2,65E-04	-5,33E-05	5,36E+01
GWP – LULUC	kg CO_2e	1,61E-01	1,02E-04	6,75E-03	1,68E-01	3,82E-05	8,58E-06	ND	ND	ND	ND	ND	3,34E+00	ND	0,00E+00	5,02E-05	1,29E-04	4,17E-05	-3,35E-02
Ozone depletion pot.	kg CFC_{-11}e	1,05E-06	4,28E-09	5,34E-08	1,10E-06	1,26E-09	2,24E-10	ND	ND	ND	ND	ND	3,31E-06	ND	0,00E+00	1,59E-09	9,83E-10	5,53E-10	-1,72E-07
Acidification potential	mol H^+e	2,43E-01	1,67E-03	1,22E-02	2,57E-01	2,91E-04	6,92E-05	ND	ND	ND	ND	ND	8,88E-01	ND	0,00E+00	3,78E-04	9,04E-04	2,12E-04	-4,80E-01
EP-freshwater[2)]	kg Pe	1,62E-02	1,62E-05	2,85E-04	1,66E-02	6,65E-06	3,48E-06	ND	ND	ND	ND	ND	6,62E-02	ND	0,00E+00	8,83E-06	4,80E-05	5,02E-06	-2,57E-02
EP-marine	kg Ne	3,08E-02	4,86E-04	2,90E-03	3,42E-02	9,57E-05	7,33E-05	ND	ND	ND	ND	ND	1,55E-01	ND	0,00E+00	1,23E-04	2,18E-04	2,20E-04	-5,54E-02
EP-terrestrial	mol Ne	3,43E-01	5,34E-03	4,67E-02	3,95E-01	1,04E-03	2,72E-04	ND	ND	ND	ND	ND	1,66E+00	ND	0,00E+00	1,33E-03	2,34E-03	9,18E-04	-5,81E-01
POCP ("smog")[3)]	kg NMVOCe	1,11E-01	1,85E-03	8,54E-03	1,22E-01	4,29E-04	9,40E-05	ND	ND	ND	ND	ND	4,96E-01	ND	0,00E+00	5,27E-04	6,73E-04	2,77E-04	-1,83E-01
ADP-minerals & metals[4)]	kg Sbe	2,88E-03	6,07E-07	2,94E-06	2,89E-03	2,38E-07	4,44E-08	ND	ND	ND	ND	ND	4,59E-03	ND	0,00E+00	3,73E-07	4,08E-06	8,25E-08	-1,35E-03
ADP-fossil resources	MJ	3,45E+02	3,60E+00	1,13E+01	3,60E+02	1,24E+00	2,19E-01	ND	ND	ND	ND	ND	7,58E+03	ND	0,00E+00	1,59E+00	1,16E+00	4,80E-01	-4,20E+02
Water use[5)]	m^3e depr.	3,50E+03	1,64E-02	6,55E-01	3,51E+03	6,12E-03	5,05E-03	ND	ND	ND	ND	ND	2,10E+02	ND	0,00E+00	7,38E-03	3,78E-02	1,67E-02	-3,86E+00

1) GWP = Global Warming Potential. 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e. 3) POCP = Photochemical ozone formation. 4) ADP = Abiotic depletion potential. 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	8,26E-07	2,18E-08	1,48E-07	9,95E-07	8,55E-09	1,33E-09	ND	ND	ND	ND	ND	5,88E-06	ND	0,00E+00	9,01E-09	1,13E-08	3,74E-09	-2,25E-06
Ionizing radiation[6)]	kBq U235e	1,08E+00	3,31E-03	4,41E-02	1,12E+00	1,08E-03	6,62E-04	ND	ND	ND	ND	ND	4,33E+02	ND	0,00E+00	1,29E-03	6,25E-03	6,89E-04	-2,37E+00
Ecotoxicity (freshwater)	CTUe	1,79E+02	4,29E-01	1,66E+01	1,96E+02	1,75E-01	5,44E-02	ND	ND	ND	ND	ND	8,51E+02	ND	0,00E+00	2,52E-01	1,10E+00	7,27E+01	-1,47E+02
Human toxicity, cancer	CTUh	2,42E-08	4,16E-11	1,40E-09	2,56E-08	1,41E-11	5,80E-12	ND	ND	ND	ND	ND	9,13E-08	ND	0,00E+00	1,93E-11	8,58E-11	1,22E-10	-2,36E-08
Human tox. non-cancer	CTUh	2,41E-06	2,21E-09	2,62E-08	2,44E-06	8,02E-10	3,61E-10	ND	ND	ND	ND	ND	4,67E-06	ND	0,00E+00	9,96E-10	4,99E-09	3,94E-09	-1,29E-06
SQP[7)]	-	1,56E+02	3,07E+00	2,04E+02	3,63E+02	1,25E+00	1,79E-01	ND	ND	ND	ND	ND	2,53E+03	ND	0,00E+00	9,51E-01	1,57E+00	6,72E-01	-2,54E+03

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 the 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	1,24E+02	4,83E-02	3,66E+01	1,61E+02	1,70E-02	-4,28E+00	ND	ND	ND	ND	ND	2,71E+03	ND	0,00E+00	2,18E-02	1,69E-01	1,14E-02	-2,76E+02
Renew. PER as material	MJ	3,86E-01	ND	8,20E+00	8,58E+00	0,00E+00	-8,20E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-1,42E-01	-2,44E-01	0,00E+00
Total use of renew. PER	MJ	1,24E+02	4,83E-02	4,48E+01	1,69E+02	1,70E-02	-1,25E+01	ND	ND	ND	ND	ND	2,71E+03	ND	0,00E+00	2,18E-02	2,69E-02	-2,32E-01	-2,76E+02
Non-re. PER as energy	MJ	3,07E+02	3,60E+00	1,00E+01	3,20E+02	1,24E+00	2,19E-01	ND	ND	ND	ND	ND	7,58E+03	ND	0,00E+00	1,59E+00	-3,29E+00	-4,17E+00	-4,20E+02
Non-re. PER as material	MJ	8,88E+00	0,00E+00	1,29E+00	1,02E+01	0,00E+00	-1,29E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-3,90E+00	-4,87E+00	0,00E+00
Total use of non-re. PER	MJ	3,16E+02	3,60E+00	1,13E+01	3,31E+02	1,24E+00	-1,07E+00	ND	ND	ND	ND	ND	7,58E+03	ND	0,00E+00	1,59E+00	-7,19E+00	-9,04E+00	-4,20E+02
Secondary materials	kg	1,26E-01	0,00E+00	0,00E+00	1,26E-01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	1,07E-01	1,68E-05	2,32E-01	3,39E-01	6,70E-06	1,20E-06	ND	ND	ND	ND	ND	4,43E-03	ND	0,00E+00	9,11E-06	5,69E-05	6,98E-06	-1,38E-03
Non-ren. secondary fuels	MJ	2,79E-01	0,00E+00	0,00E+00	2,79E-01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,31E-01	4,79E-04	5,52E-03	2,37E-01	1,83E-04	-4,59E-04	ND	ND	ND	ND	ND	6,65E+00	ND	0,00E+00	2,11E-04	8,45E-04	-1,41E-03	-1,63E-01

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,72E+00	5,30E-03	5,18E-02	1,78E+00	2,10E-03	1,11E-03	ND	ND	ND	ND	ND	1,17E+01	ND	0,00E+00	2,78E-03	1,34E-02	9,80E-02	-8,45E+00
Non-hazardous waste	kg	4,97E+01	9,87E-02	1,97E+00	5,18E+01	3,89E-02	8,18E-01	ND	ND	ND	ND	ND	3,33E+02	ND	0,00E+00	5,20E-02	3,62E-01	3,65E+00	-9,42E+01
Radioactive waste	kg	1,12E-03	8,15E-07	1,67E-05	1,14E-03	2,64E-07	1,68E-07	ND	ND	ND	ND	ND	9,31E-02	ND	0,00E+00	3,16E-07	1,53E-06	1,69E-07	-5,72E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	3,77E-01	0,00E+00	2,25E-01	6,03E-01	0,00E+00	1,14E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	2,36E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	2,36E-02	0,00E+00	0,00E+00	2,36E-02	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	1,16E-01	0,00E+00	0,00E+00	1,16E-01	0,00E+00	5,80E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	1,39E+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	2,44E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	5,87E-01	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	3,36E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	8,08E-01	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG [9)]	kg CO_2e	2,26E+01	2,55E-01	8,73E-01	2,37E+01	8,54E-02	1,49E-02	ND	ND	ND	ND	ND	1,75E+02	ND	0,00E+00	1,14E-01	3,82E-01	2,25E-01	-4,11E+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 characterization factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION
DATA SOURCES

Manufacturing energy scenario documentation – A3 (Energy data source)

1. District heat, District Heat, Finland, 2022, Finland, LCA study for country specific district heating based on IEA, OneClickLCA 2024, 0.18 kgCO2e/kWh
2. Energy supply, heat, steam and air conditioning, heat from wood fuel co-generation, Heat and power co-generation, wood chips, 6667 kW, state-of-the-art 2014, Finland, ecoinvent 3.10.1, 0.0550 kgCO2e/kWh

Transport scenario documentation - A4

1. Market for transport, freight, lorry >32 metric ton, EURO5, 180 km

Installation scenario documentation - A5 (Energy data source)

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Installation scenario documentation - A5 (Waste materials data source)

1. Corrugated board box production, 0.14, kg
2. Packaging film production, low density polyethylene, 0.02, kg
3. Eur-flat pallet production, 0.0204, unit

Use stages scenario documentation - B4 (Installation data source)

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Use stages scenario documentation - B6-B7 (Energy data source)

1. Energy supply, electricity transformation and distribution, distribution low voltage, Market for electricity, low voltage, Finland, 1134.0, kWh

TRANSPORT SCENARIO DOCUMENTATION - A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50 %
Bulk density of transported products / kg/m³	0,00E+00
Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products)	1

INSTALLATION SCENARIO DOCUMENTATION - A5

Scenario parameter	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	0
Water use / m³	0
Other resource use / kg	0
Direct emissions to ambient air, soil and water / kg	0

USE STAGES SCENARIO DOCUMENTATION - B4 REPLACEMENT

Scenario information	Value
Replacement cycle / Number per RSL or year	-

USE STAGES SCENARIO DOCUMENTATION - B6-B7 USE OF ENERGY AND WATER

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	Not applicable
Net fresh water consumption / m³	0
Power output of equipment / W	30
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc. / Units as appropriate	-
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants / Units as appropriate	-

END OF LIFE SCENARIO DOCUMENTATION

Scenario information	Value
Collection process – kg collected separately	3,8801
Collection process – kg collected with mixed construction waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	2,36E+00
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	1,37E+00
Scenario assumptions e.g. transportation	Lorry, 16-32 metric ton, EURO5; 150 km

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.

Sergio Ballen Zamora as an authorized verifier acting for EPD Hub Limited.

08.11.2025

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: Hai Ha Nguyen
Tool verification validity: 28 March 2025 - 27 March 2028