ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

CASA R9-H
Swegon Group AB

EPD HUB, HUB-5717
Published on 13.03.2026, last updated on 13.03.2026, valid until 13.03.2031

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	Swegon Group AB
Address	J A Wettergrens gata 7, 421 30, Västra Frölunda, Sweden
Contact details	info@swegon.se
Website	www.swegon.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	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Sarita Keppola
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Imane Uald Lamkaddam 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	CASA R9-H
Additional labels	-
Product reference	-
Place(s) of raw material origin	Europe
Place of production	Kaarina, Finland
Place(s) of installation and use	Finland, Sweden and Norway
Period for data	Calendar year 2025
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	63,5

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of CASA R9-H
Declared unit mass	140,4 kg
Mass of packaging	25,84 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	419
GWP-total, A1-A3 ($kgCO_2e$)	388
Secondary material, inputs (%)	9,1
Secondary material, outputs (%)	76
Total energy use, A1-A3 (kWh)	1440
Net freshwater use, A1-A3 (m^3)	28,3

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

People spend most of their time indoors, which is why we need a sound indoor climate for our health, well-being and happiness. Swegon's ambition is to achieve the world’s best indoor environment with the least possible impact on the external environment. Our business models, services, products and systems are all designed to provide the right solution for each individual project.

Swegon Group AB is a market leading supplier in the field of indoor environment, offering solutions for ventilation, heating, cooling and climate optimization, as well as connected services and expert technical support. Swegon has subsidiaries and distributors all over the world and production plants in Europe, North America and India. The company employs more than 3 300 people.

PRODUCT DESCRIPTION

The air handling unit is a device, which will provide healthy dust free air to buildings with a good energy efficiency. Energy efficiency is created with a good design and optimization between fans, heat exchanger, filtration, control and modular space requirements.
Swegon CASA products are known in the market for their high quality, energy efficiency, silence and ease of use.
Swegon CASA R9-H is residential air handling unit (1100 x 789 x 1037 mm, Ø 315 mm) with rotary heat exchanger, suitable for large houses (277 l/s, 500 m²), office or conference rooms.
The unit is controlled steplessly with automation functions to guarantee the best indoor environmental quality. The ventilation unit has intelligent demand-controlled humidity automation RH and CO2 as standard. VOC automation is available as accessory. Intelligent anti-frost protection ensures continuous ventilation in cold climate and automatic summer function with passive cooling helps to keep indoor climate comfortable during summer.

Further information can be found at:
www.swegon.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	83	Europe
Minerals	11	Europe
Fossil materials	6	Europe
Bio-based materials	<1	Europe

BIOGENIC CARBON CONTENT

Product’s biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,213
Biogenic carbon content in packaging, kg C	8,618

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of CASA R9-H
Mass per declared unit	140,4 kg
Functional unit	The functional unit is defined as providing annual heating saved average 4569 kWh/a primary energy (AHS) and annual electricity consumption 128 kWh/a/100m² (AEC) (EU 1253/2014 regulation). Thus heating saved average over the course of 25 years, is 114225 kWh primary energy and consumed electricity over the course of 25 years, is 3200 kWh/100m².
Reference service life	25 years

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	x	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	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.
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A market-based approach is used in modelling the electricity mix utilized in the factory.
The unit is manufactured in Swegon ILTO Oy factory in Kaarina, Finland. Factory is an assembly factory, which doesn't manufacture any components by itself, just assemble units with components manufactured by suppliers. The product stage takes into account the manufacture of raw materials, their transport to the production plant and the stages of the product manufacturing process. The most relevant components were modelled based on primary data from the supplier, while some other components were modelled with proxy data. Transportation of raw material to the manufacturing site is accounted based both on actual distance and mode of transport and on generic datasets. Packaging material (cardboard and wood pallet) is included. The manufacturing mainly refers the assembling configurating and testing of the air handling units from pre-made parts. The assessment covers the electricity and heating use needed during the production process. The manufacturing energy and heat are both based on 100% renewable as proved by a green contract with the local companies. 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.

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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.

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The transportation (A4) is calculated to be from factory Kaarina, Finland, to the main market areas of the products in: Stockholm / Sweden (65%), Oslo / Norway (20%) and Helsinki / Finland (15%). Average distances between the production facility and destinations are used. The transportation methods are by truck and ferry.
Variation of market shares between different products is taken into account. Material loss of the air handling unit during the installation phase is estimated to be zero. Installation is done by manpower with lift table and hand tools, no machinery needed.
A5 covers packaging material. The recycling percentages of materials are EU scenarios. 83% of paper packaging goes to recycling, 8% is incinerated and 9% is landfilled. For wood packaging 32% is recycled, 38% is landfilled and 30% incinerated. For plastic packaging 40% is recycled, 37% is incinerated and 23% is landfilled. It is assumed that the nearest waste station is about 50 km from the installation site.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD follows additional requirements for products which are permanently installed into the building and using energy in module B6 of the use stage. Electricity consumption during the use phase is calculated over a 25-year period. Energy use refers to the daily estimated electricity consumption of the air handling unit. Energy use during the product use phase and the replacement of filters are taken into account. Filters are replaced by assumption once each year during the 25-year life cycle. Replacement of components or parts is not included. Please note that the environmental impact during the use phase varies according to individual usage patterns and geographic location. The results presented for module B6 in this EPD are scenario-based only. Therefore, the environmental impact from the use phase should be examined separately for individual projects. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

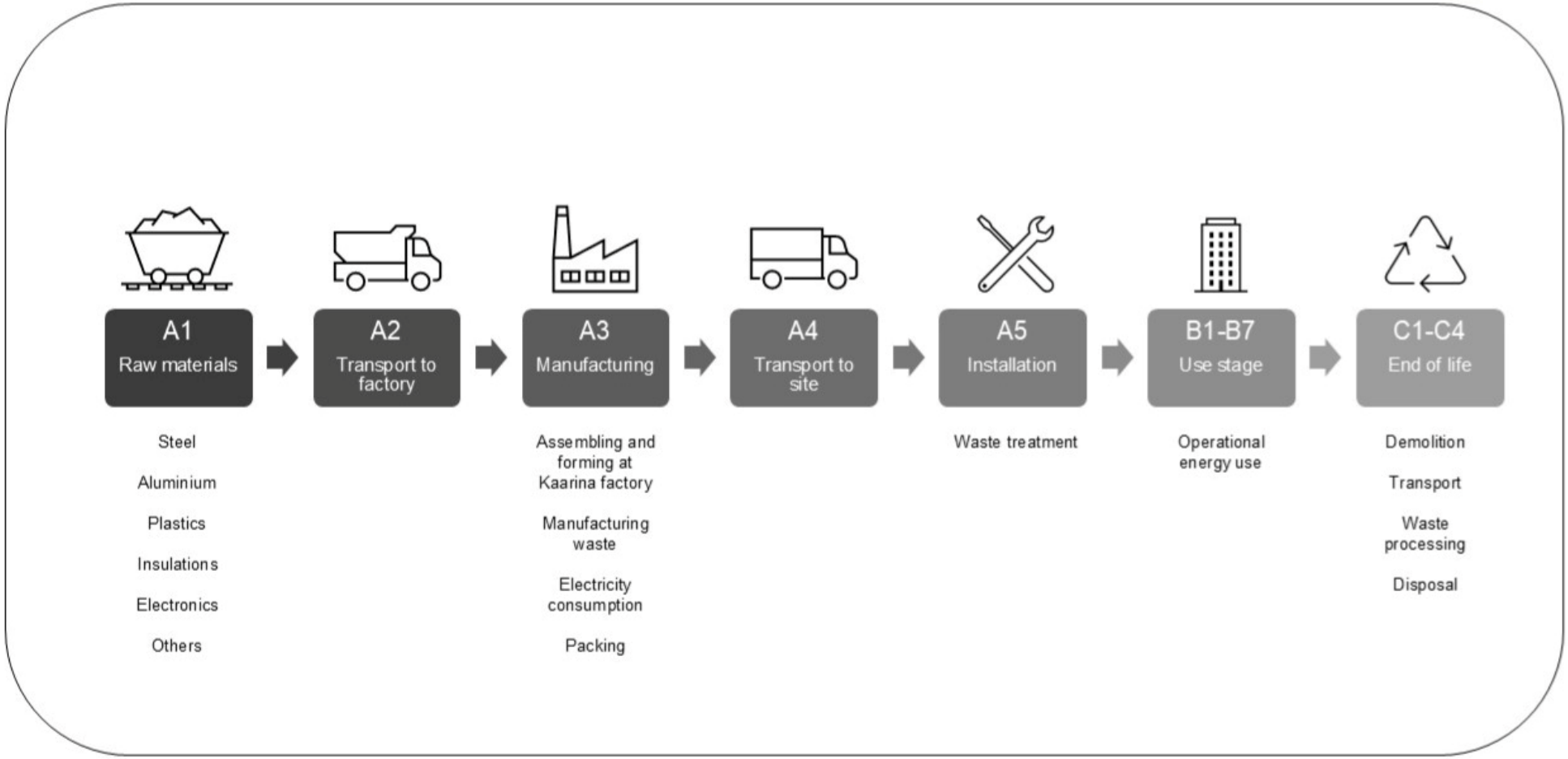
At the end of the product's service life, the air handling unit is assumed to be demolished. The environmental impact of deconstruction (Module C1) is modelled using literature data.

Transport of waste materials to end-of-life treatment facilities (Module C2) is modelled using assumed average distances of 50 km to recycling facilities and 50 km to landfill sites. All transportation is carried out using a 16-32 metric ton freight lorry compliant with EURO 5 standards. It is assumed that materials intended for recycling are collected separately at the demolition site.

Waste processing (Module C3) and final disposal (Module C4) are modelled using literature-based scenarios representing typical end-of-life treatment routes. The primary materials considered are steel and mineral insulation. For steel, it is assumed that 85% is recycled and 15% is disposed of in landfill. For mineral insulation, a conservative assumption is applied whereby 100% is disposed of in landfill. For plastic components, 100% is assumed to be incinerated. For electronics scrap from control unit and used cables are assumed that 100% are recycled.

Due to the material and energy recovery potential of the components included in the product, the end-of-life can be converted into recycled raw materials or energy through incineration. The potential environmental benefits and burdens associated with recycling and energy recovery processes are accounted for in Module D.

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.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	No applicable
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

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

This EPD is product and factory specific.

LCA SOFTWARE AND BIBLIOGRAPHY

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

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	3,97E+02	4,55E+00	-1,38E+01	3,88E+02	1,00E+01	3,32E+01	ND	ND	ND	1,89E+02	ND	1,05E+04	ND	0,00E+00	1,36E+00	2,68E+01	3,11E-01	-1,80E+02
GWP – fossil	kg CO_2e	3,98E+02	4,55E+00	1,69E+01	4,19E+02	1,00E+01	1,65E+00	ND	ND	ND	1,89E+02	ND	1,02E+04	ND	0,00E+00	1,36E+00	2,68E+01	2,10E-01	-1,68E+02
GWP – biogenic	kg CO_2e	-7,80E-01	5,50E-04	-3,07E+01	-3,15E+01	1,77E-03	3,16E+01	ND	ND	ND	2,36E-02	ND	3,26E+02	ND	0,00E+00	2,69E-04	8,49E-03	1,01E-01	-1,17E+01
GWP – LULUC	kg CO_2e	2,41E-01	1,73E-03	3,07E-02	2,73E-01	4,08E-03	1,34E-03	ND	ND	ND	3,47E-01	ND	3,00E+01	ND	0,00E+00	4,80E-04	1,07E-03	1,20E-04	-2,39E-02
Ozone depletion pot.	kg CFC_{-11}e	8,51E-06	8,54E-08	3,93E-07	8,98E-06	1,78E-07	1,41E-08	ND	ND	ND	5,51E-06	ND	1,89E-04	ND	0,00E+00	2,70E-08	1,02E-07	5,98E-09	-6,13E-07
Acidification potential	mol H^+e	1,88E+00	3,83E-02	8,78E-02	2,00E+00	1,36E-01	4,96E-03	ND	ND	ND	6,13E-01	ND	5,85E+01	ND	0,00E+00	4,25E-03	6,06E-02	1,48E-03	-6,73E-01
EP-freshwater[2)]	kg Pe	7,67E-02	2,68E-04	2,60E-03	7,95E-02	5,16E-04	2,48E-04	ND	ND	ND	3,48E-02	ND	9,75E+00	ND	0,00E+00	9,00E-05	3,13E-04	1,79E-05	-7,28E-02
EP-marine	kg Ne	4,39E-01	1,06E-02	2,34E-02	4,73E-01	3,61E-02	5,12E-03	ND	ND	ND	1,68E-01	ND	9,32E+00	ND	0,00E+00	1,43E-03	2,84E-02	5,67E-04	-1,48E-01
EP-terrestrial	mol Ne	4,21E+00	1,17E-01	2,55E-01	4,58E+00	3,99E-01	2,02E-02	ND	ND	ND	1,43E+00	ND	8,26E+01	ND	0,00E+00	1,56E-02	3,04E-01	6,20E-03	-1,62E+00
POCP ("smog")[3)]	kg NMVOCe	1,41E+00	3,82E-02	9,45E-02	1,54E+00	1,19E-01	6,63E-03	ND	ND	ND	5,13E-01	ND	2,64E+01	ND	0,00E+00	6,65E-03	8,97E-02	2,23E-03	-5,52E-01
ADP-minerals & metals[4)]	kg Sbe	2,46E-02	1,27E-05	4,39E-05	2,47E-02	2,33E-05	2,55E-06	ND	ND	ND	4,52E-03	ND	1,38E-01	ND	0,00E+00	4,44E-06	4,33E-06	3,24E-07	-1,60E-03
ADP-fossil resources	MJ	4,10E+03	6,22E+01	2,38E+02	4,40E+03	1,34E+02	1,25E+01	ND	ND	ND	2,09E+03	ND	2,34E+05	ND	0,00E+00	1,91E+01	8,58E+01	5,16E+00	-1,57E+03
Water use[5)]	m^3e depr.	1,13E+02	2,80E-01	2,79E+02	3,93E+02	5,44E-01	4,52E-01	ND	ND	ND	4,33E+01	ND	6,55E+03	ND	0,00E+00	9,36E-02	2,02E+00	1,19E-01	-2,86E+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	9,05E-06	3,11E-07	2,19E-06	1,16E-05	5,92E-07	9,44E-08	ND	ND	ND	5,85E-06	ND	2,08E-04	ND	0,00E+00	1,07E-07	1,60E-06	3,39E-08	-1,11E-05
Ionizing radiation[6)]	kBq U235e	9,39E+00	7,01E-02	1,31E+00	1,08E+01	1,28E-01	3,23E-02	ND	ND	ND	9,60E+00	ND	6,56E+03	ND	0,00E+00	2,43E-02	5,90E-02	3,17E-03	5,00E+00
Ecotoxicity (freshwater)	CTUe	7,61E+03	7,52E+00	2,25E+02	7,84E+03	1,46E+01	2,04E+01	ND	ND	ND	6,49E+03	ND	3,24E+05	ND	0,00E+00	2,50E+00	7,69E+01	1,91E+00	-4,13E+02
Human toxicity, cancer	CTUh	8,69E+00	8,14E-10	3,83E-08	8,69E+00	1,85E-09	5,01E-10	ND	ND	ND	1,96E-07	ND	3,03E-06	ND	0,00E+00	2,31E-10	2,54E-09	3,85E-11	-2,71E-08
Human tox. non-cancer	CTUh	2,29E+01	3,46E-08	2,72E-07	2,29E+01	6,50E-08	2,40E-08	ND	ND	ND	2,63E-06	ND	1,65E-04	ND	0,00E+00	1,20E-08	7,56E-08	8,75E-10	-1,33E-06
SQP[7)]	-	6,54E+02	3,11E+01	2,74E+03	3,42E+03	5,43E+01	1,18E+01	ND	ND	ND	3,87E+02	ND	4,58E+04	ND	0,00E+00	1,13E+01	7,32E+00	1,02E+01	-5,15E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	2,56E+02	9,64E-01	7,17E+02	9,73E+02	1,81E+00	-3,70E+02	ND	ND	ND	1,17E+02	ND	6,32E+04	ND	0,00E+00	3,30E-01	9,12E-01	4,90E-02	-3,88E+01
Renew. PER as material	MJ	3,60E-01	0,00E+00	3,14E+02	3,15E+02	0,00E+00	-3,14E+02	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	-3,60E-01	0,00E+00	1,03E+02
Total use of renew. PER	MJ	2,56E+02	9,64E-01	1,03E+03	1,29E+03	1,81E+00	-6,84E+02	ND	ND	ND	1,17E+02	ND	6,32E+04	ND	0,00E+00	3,30E-01	5,52E-01	4,90E-02	6,40E+01
Non-re. PER as energy	MJ	3,96E+03	6,22E+01	1,68E+02	4,19E+03	1,34E+02	-1,38E+01	ND	ND	ND	5,37E+02	ND	2,34E+05	ND	0,00E+00	1,91E+01	-2,15E+02	5,16E+00	-1,57E+03
Non-re. PER as material	MJ	2,61E+02	0,00E+00	5,03E+01	3,11E+02	0,00E+00	-5,03E+01	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	-2,59E+02	-1,25E+00	1,79E+01
Total use of non-re. PER	MJ	4,22E+03	6,22E+01	2,18E+02	4,50E+03	1,34E+02	-6,41E+01	ND	ND	ND	5,37E+02	ND	2,34E+05	ND	0,00E+00	1,91E+01	-4,74E+02	3,91E+00	-1,55E+03
Secondary materials	kg	1,28E+01	2,82E-02	1,23E+00	1,40E+01	6,02E-02	9,08E-03	ND	ND	ND	1,48E+00	ND	3,77E+01	ND	0,00E+00	8,73E-03	3,72E-02	1,29E-03	9,10E+01
Renew. secondary fuels	MJ	2,29E-02	3,04E-04	1,06E+01	1,06E+01	5,39E-04	9,33E-05	ND	ND	ND	1,60E-02	ND	3,25E-01	ND	0,00E+00	1,10E-04	2,63E-04	2,68E-05	-1,36E-02
Non-ren. secondary fuels	MJ	3,71E-02	0,00E+00	0,00E+00	3,71E-02	0,00E+00	0,00E+00	ND	ND	ND	0,00E+00	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	2,81E+01	7,59E-03	2,01E-01	2,83E+01	1,45E-02	-3,22E-02	ND	ND	ND	1,02E+00	ND	1,53E+02	ND	0,00E+00	2,57E-03	3,93E-02	5,35E-03	-4,04E-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	8,87E+00	8,67E-02	9,19E-01	9,88E+00	1,81E-01	8,83E-02	ND	ND	ND	9,12E+00	ND	5,68E+02	ND	0,00E+00	2,73E-02	5,44E-01	5,78E-03	-5,46E+01
Non-hazardous waste	kg	4,39E+02	1,73E+00	2,29E+01	4,63E+02	3,37E+00	3,44E+01	ND	ND	ND	3,18E+02	ND	4,78E+04	ND	0,00E+00	5,77E-01	1,13E+01	1,33E-01	-4,39E+02
Radioactive waste	kg	1,92E-02	1,74E-05	2,43E-04	1,95E-02	3,18E-05	8,04E-06	ND	ND	ND	2,46E-03	ND	1,68E+00	ND	0,00E+00	6,04E-06	1,45E-05	7,72E-07	1,30E-03

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	3,65E-04	0,00E+00	0,00E+00	3,65E-04	0,00E+00	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	2,23E+00	0,00E+00	2,96E+00	5,19E+00	0,00E+00	8,41E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	9,84E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	1,34E+00	1,34E+00	0,00E+00	7,75E+00	ND	ND	ND	2,88E+01	ND	0,00E+00	ND	0,00E+00	0,00E+00	8,27E+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	4,37E+01	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,84E+01	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,53E+01	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+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_2e	3,88E+02	4,52E+00	1,69E+01	4,10E+02	9,97E+00	2,21E+00	ND	ND	ND	1,88E+02	ND	1,02E+04	ND	0,00E+00	1,35E+00	2,68E+01	2,09E-01	-1,67E+02
Ozone depletion Pot.	kg CFC_{-11}e	7,90E-06	6,80E-08	3,33E-07	8,30E-06	1,41E-07	1,14E-08	ND	ND	ND	5,23E-06	ND	1,61E-04	ND	0,00E+00	2,15E-08	8,22E-08	4,76E-09	-6,58E-07
Acidification	kg SO_2e	1,47E+00	3,01E-02	6,92E-02	1,57E+00	1,08E-01	3,68E-03	ND	ND	ND	4,93E-01	ND	4,98E+01	ND	0,00E+00	3,23E-03	4,27E-02	1,10E-03	-5,43E-01
Eutrophication	kg PO_4^3e	1,05E+00	4,59E-03	2,89E-01	1,34E+00	1,41E-02	1,31E-03	ND	ND	ND	1,56E+00	ND	6,79E+00	ND	0,00E+00	8,21E-04	1,04E-02	3,56E-04	-9,94E-02
POCP (“smog”)	kg C_2H_4e	1,36E-01	1,89E-03	8,90E-03	1,47E-01	6,02E-03	4,25E-04	ND	ND	ND	4,71E-02	ND	2,69E+00	ND	0,00E+00	3,08E-04	3,17E-03	1,04E-04	-8,38E-02
ADP-elements	kg Sbe	2,46E-02	1,25E-05	4,26E-05	2,46E-02	2,28E-05	2,45E-06	ND	ND	ND	4,25E-03	ND	1,37E-01	ND	0,00E+00	4,34E-06	3,66E-06	3,17E-07	-1,60E-03
ADP-fossil	MJ	2,14E+05	6,10E+01	2,26E+02	2,15E+05	1,32E+02	1,20E+01	ND	ND	ND	1,92E+03	ND	1,18E+05	ND	0,00E+00	1,87E+01	8,49E+01	5,11E+00	-1,66E+03

ENVIRONMENTAL IMPACTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Radioactive waste, high	kg	5,49E-04	4,35E-06	4,65E-05	6,00E-04	8,09E-06	2,14E-06	ND	ND	ND	6,07E-04	ND	3,78E-01	ND	0,00E+00	1,50E-06	4,12E-06	2,22E-07	2,23E-04
Radioactive waste, int/low	kg	1,66E-03	1,30E-05	6,21E-04	2,30E-03	2,37E-05	5,91E-06	ND	ND	ND	1,86E-03	ND	1,30E+00	ND	0,00E+00	4,55E-06	1,04E-05	5,50E-07	1,08E-03

ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements	kg Sbe	7,07E-04	1,25E-05	3,75E-05	7,57E-04	2,28E-05	7,98E-07	ND	ND	ND	4,78E-05	ND	0,00E+00	ND	0,00E+00	4,34E-06	2,13E-06	1,67E-07	-1,59E-03
Hazardous waste disposed	kg	8,44E+00	8,67E-02	1,42E+00	9,94E+00	1,81E-01	8,83E-02	ND	ND	ND	9,12E+00	ND	5,68E+02	ND	0,00E+00	2,73E-02	5,44E-01	5,78E-03	-5,46E+01
Non-haz. waste disposed	kg	4,31E+02	1,73E+00	2,26E+01	4,55E+02	3,37E+00	3,44E+01	ND	ND	ND	3,18E+02	ND	4,78E+04	ND	0,00E+00	5,77E-01	1,13E+01	1,33E-01	-4,39E+02
Air pollution	m^3	5,47E+04	8,36E+02	2,86E+03	5,83E+04	1,85E+03	2,44E+02	ND	ND	ND	4,14E+04	ND	3,25E+06	ND	0,00E+00	2,50E+02	1,09E+03	4,88E+01	-7,86E+04
Water pollution	m^3	7,53E+02	3,38E+01	8,49E+01	8,72E+02	7,11E+01	5,83E+00	ND	ND	ND	1,40E+03	ND	1,94E+05	ND	0,00E+00	1,06E+01	4,31E+01	2,42E+00	6,64E+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	3,98E+02	4,55E+00	1,69E+01	4,20E+02	1,00E+01	1,65E+00	ND	ND	ND	1,89E+02	ND	1,02E+04	ND	0,00E+00	1,36E+00	2,68E+01	2,11E-01	-1,68E+02

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

ENVIRONMENTAL IMPACTS – TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,43E+02	4,48E+00	1,68E+01	1,65E+02	9,89E+00	2,14E+00	ND	ND	ND	1,88E+02	ND	1,01E+04	ND	0,00E+00	1,34E+00	2,67E+01	2,05E-01	-1,66E+02
Ozone Depletion	kg $CFC_{-11}e$	3,45E-02	9,01E-08	4,23E-07	3,45E-02	1,87E-07	1,49E-08	ND	ND	ND	5,78E-06	ND	1,99E-04	ND	0,00E+00	2,85E-08	1,08E-07	6,31E-09	-7,47E-07
Acidification	kg SO_2e	8,67E-01	3,30E-02	7,54E-02	9,76E-01	1,17E-01	4,51E-03	ND	ND	ND	5,39E-01	ND	4,77E+01	ND	0,00E+00	3,75E-03	5,60E-02	1,34E-03	-5,75E-01
Eutrophication	kg Ne	4,26E-01	1,96E-03	1,12E-01	5,40E-01	5,61E-03	1,30E-03	ND	ND	ND	7,03E-01	ND	8,83E+00	ND	0,00E+00	4,08E-04	4,67E-03	1,51E-04	-8,32E-02
POCP (“smog”)	kg O_3e	8,80E+00	7,06E-01	1,81E+00	1,13E+01	2,36E+00	1,22E-01	ND	ND	ND	8,23E+00	ND	4,64E+02	ND	0,00E+00	9,94E-02	1,83E+00	3,83E-02	-9,04E+00
ADP-fossil	MJ	9,90E+01	6,22E+01	1,19E+01	1,73E+02	1,34E+02	3,51E+00	ND	ND	ND	8,36E+01	ND	0,00E+00	ND	0,00E+00	1,91E+01	7,99E+01	2,63E+00	-1,55E+03

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
District heating data source and quality	District Heat, Finland, 2023, Finland, One Click LCA
District heating kg CO2e / kWh	0,14 kg CO2e / kWh
Electricity data source and quality	Electricity production, hydro, run-of-river, Finland, Ecoinvent
Electricity kg CO2e / kWh	0,0044 kgCO2e / kWh

Transport scenario documentation - A4

Scenario parameter	Value
Fuel and vehicle type. Diesel powered truck and ferry	Transport, freight, lorry 16-32 metric ton EURO5 and Transport, freight, sea, ferry
Average transport distance (Norway), km	537 km and 235 km
Fuel and vehicle type. Diesel powered truck and ferry	Transport, freight, lorry 16-32 metric ton EURO5
Average transport distance (Finland), km	161 km
Fuel and vehicle type. Diesel powered truck and ferry	Transport, freight, lorry 16-32 metric ton EURO5 and Transport, freight, sea, ferry
Average transport distance (Sweden), km	88 km and 235 km
Capacity utilization (including empty return) %	50
Bulk density of transported products	1,23E+02
Volume capacity utilization factor	<1

Installation scenario documentation - A5

Scenario parameter	Value
Treatment of waste packaging paper, municipal incineration, Ecoinvent, Materials for energy recovery	0,015 kg
Exported Energy: Electricity, Ecoinvent	0,033 MJ
Exported Energy: Thermal, Ecoinvent	0,046 MJ
Treatment of waste paper, unsorted, sorting, Ecoinvent, Materials for recycling	0,15 kg
Treatment of waste packaging paper, sanitary landfill	0,017 kg
Treatment of waste polyethylene, municipal incineration, Ecoinvent, Materials for energy recovery	0,24 kg
Exported Energy: Electricity, Ecoinvent	1,64 MJ
Exported Energy: Thermal, Ecoinvent	2,26 MJ
Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling	0,26 kg
Treatment of waste polyethylene, sanitary landfill, Ecoinvent	0,15 kg
Treatment of waste wood, untreated, municipal incineration, Ecoinvent, Materials for energy recovery	7,5 kg
Exported Energy: Electricity, Ecoinvent	16,75 MJ
Exported Energy: Thermal, Ecoinvent	23,0 MJ
Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling	8,0 kg
Treatment of waste wood, untreated, sanitary landfill	9,5 kg

Use stages scenario documentation - B4

Scenario parameter	Value
Glass fibre production, Ecoinvent	11,5 kg
Polyethylene production, low density, granulate, Ecoinvent	0,06 kg
Polyurethane adhesive production, Ecoinvent	16,39 kg
Tissue paper production, recycled, Ecoinvent	0,81 kg
Treatment of waste plastic, mixture, municipal incineration, Ecoinvent	28,75 kg
Replacement cycle / Number per RSL or year	Filter replacement recommended by the manufacturer once a year over 25 year product reference service life

Use stages scenario documentation - B6-B7 Use of energy and use of water

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	-
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc.	Electric current is mostly used to control air handling unit's fans and in cold climate also unit's heaters. The energy consumption thus in module B6 comes from the usage of the ventilation unit. Energy used: Market group for electricity, low voltage for Geography Europe.
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants	The annual use hours of unit are 24h/d for 365 days, totally 8760h/a. For use phase electricity usage, the annual average electricity consumption of unit was multiplied by the 25 years.

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

Scenario parameter	Value
Treatment of electronics scrap from control units, Ecoinvent, Materials for recycling	0,264 kg
Treatment of used cable, Ecoinvent, Materials for recycling	0,81 kg
Treatment of scrap steel, inert material landfill, Ecoinvent	17,18 kg
Treatment of waste reinforcement steel, recycling, Ecoinvent, Materials for recycling	97,37 kg
Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, Materials for energy recovery	8,28 kg
Treatment of waste mineral wool, inert material landfill, Ecoinvent	16,5 kg
Scenario assumptions e.g. transportation	50km, Transport, freight, lorry, 16-32 metric ton, diesel, EURO 5

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

Imane Uald Lamkaddam as an authorized verifier for EPD Hub Limited
13.03.2026