



# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

CASA R4-C  
Swegon Group AB



**EPD HUB, HUB-5181**

Published on 30.01.2026, last updated on 30.01.2026, valid until 30.01.2031

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.

## 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:  <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> 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 R4-C
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 2024
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 (%)	2,72

## ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of CASA R4-C
Declared unit mass	67,499 kg
Mass of packaging	12,083 kg
GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)	224
GWP-total, A1-A3 (kgCO <sub>2</sub> e)	216
Secondary material, inputs (%)	19,6
Secondary material, outputs (%)	87
Total energy use, A1-A3 (kWh)	853
Net freshwater use, A1-A3 (m <sup>3</sup> )	78,8

## 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 R4-C is residential ventilation unit (1050 x 700 x 296 mm, Ø 160 mm) with rotary heat exchanger for apartments under 170 m<sup>2</sup>. Air flow range 72 - 331 m<sup>3</sup>/h. Flat design and compact size enables various mounting options, also ideal for ceiling mounting as height under 30 cm. The market's most intelligent humidity control as standard. Developed, manufactured and tested for Nordic climate.

Further information can be found at:  
[www.swegon.com](http://www.swegon.com)

### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	90	Europe
Minerals	-	-
Fossil materials	10	Europe
Bio-based materials	-	-

### BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,1394
Biogenic carbon content in packaging, kg C	3,1091

## FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of CASA R4-C
Mass per declared unit	67,499 kg
Functional unit	The functional unit is defined as providing annual heating saved average 4528 kWh/a primary energy (AHS) and annual electricity consumption 171 kWh/a/100m <sup>2</sup> (AEC) (EU 1253/2014 regulation). Thus heating saved average over the course of 25 years, is 113200 kWh primary energy and consumed electricity over the course of 25 years, is 4275 kWh/100m <sup>2</sup> .
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.

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 configuring 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.

### **TRANSPORT AND INSTALLATION (A4-A5)**

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation (A4) is calculated to be from factory Kaarina, Finland, to the main market areas of the products in: Helsinki / Finland, Stockholm / Sweden and Oslo / Norway. 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 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. 100% of plastic is incinerated. 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.

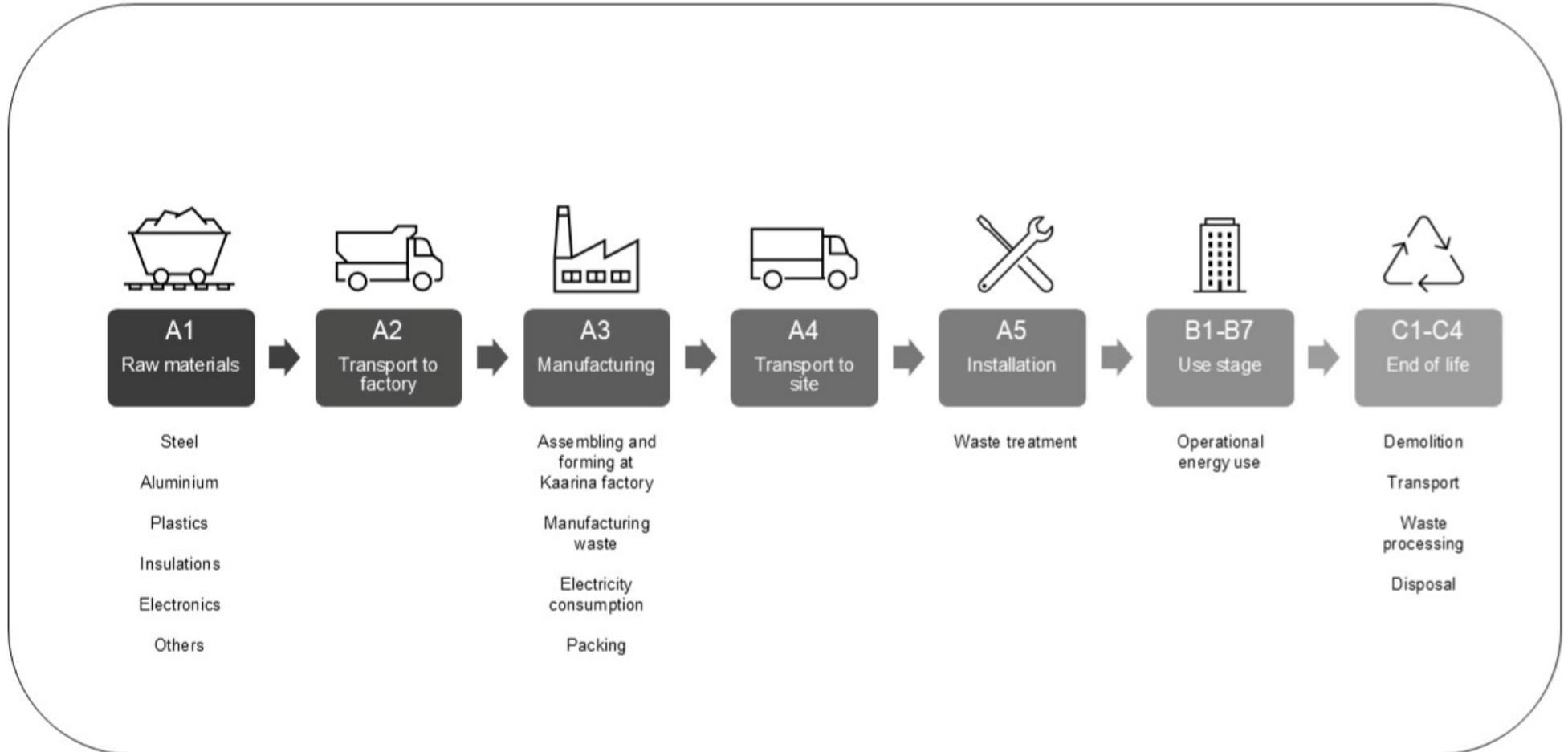
## PRODUCT END OF LIFE (C1-C4, D)

The dismantling of the product is assumed to take place after the assumed 25-year lifecycle. Transportation of the dismantled product for processing was assessed based on average waste transportation distances. It was assumed that steel, aluminium, iron, copper and the metal content in WEEE in the product will be recycled as material and other materials (e.g. plastics) sent for energy recovery.

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.

The applied scenarios, which are based on literature data, include different ratios of material recycling, incineration and landfill for the input materials.

# 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 allocation
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 <sup>1)</sup>	kg CO <sub>2</sub> e	2,12E+02	3,55E+00	-3,96E-02	2,16E+02	9,82E+00	1,27E+01	ND	ND	ND	7,70E+01	ND	4,57E+03	ND	0,00E+00	6,18E-01	2,27E+01	5,49E-02	-9,24E+01
GWP – fossil	kg CO <sub>2</sub> e	2,12E+02	3,55E+00	8,74E+00	2,24E+02	9,81E+00	1,32E+00	ND	ND	ND	7,67E+01	ND	4,42E+03	ND	0,00E+00	6,18E-01	2,27E+01	5,49E-02	-8,46E+01
GWP – biogenic	kg CO <sub>2</sub> e	5,11E-01	6,54E-04	-8,92E+00	-8,41E+00	1,83E-03	1,14E+01	ND	ND	ND	1,57E-01	ND	1,42E+02	ND	0,00E+00	1,27E-04	9,46E-04	-1,75E-05	-7,83E+00
GWP – LULUC	kg CO <sub>2</sub> e	1,87E-01	1,38E-03	1,42E-01	3,31E-01	3,76E-03	5,08E-04	ND	ND	ND	9,96E-02	ND	1,30E+01	ND	0,00E+00	2,22E-04	4,96E-04	3,14E-05	1,05E-02
Ozone depletion pot.	kg CFC <sub>-11</sub> e	3,31E-05	6,46E-08	2,59E-07	3,34E-05	1,83E-07	6,13E-09	ND	ND	ND	7,07E-05	ND	8,21E-05	ND	0,00E+00	1,21E-08	5,42E-08	1,59E-09	-2,69E-07
Acidification potential	mol H <sup>+</sup> e	8,32E-01	3,35E-02	5,50E-02	9,20E-01	8,84E-02	2,27E-03	ND	ND	ND	2,25E-01	ND	2,54E+01	ND	0,00E+00	1,95E-03	3,28E-02	3,89E-04	-3,38E-01
EP-freshwater <sup>2)</sup>	kg Pe	1,26E-01	2,07E-04	2,94E-03	1,29E-01	5,69E-04	1,12E-04	ND	ND	ND	1,38E-02	ND	4,24E+00	ND	0,00E+00	4,15E-05	1,60E-04	4,51E-06	-3,86E-02
EP-marine	kg Ne	1,86E-01	9,16E-03	1,38E-02	2,09E-01	2,43E-02	2,28E-03	ND	ND	ND	5,85E-02	ND	4,05E+00	ND	0,00E+00	6,55E-04	1,56E-02	1,48E-04	-7,68E-02
EP-terrestrial	mol Ne	1,88E+00	1,01E-01	1,62E-01	2,14E+00	2,68E-01	8,97E-03	ND	ND	ND	5,03E-01	ND	3,59E+01	ND	0,00E+00	7,12E-03	1,65E-01	1,62E-03	-8,39E-01
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	7,41E-01	3,20E-02	3,66E-02	8,10E-01	8,62E-02	2,97E-03	ND	ND	ND	2,37E-01	ND	1,15E+01	ND	0,00E+00	3,03E-03	4,82E-02	5,80E-04	-2,83E-01
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1,91E-02	9,66E-06	2,87E-05	1,91E-02	2,69E-05	1,65E-06	ND	ND	ND	4,90E-04	ND	6,00E-02	ND	0,00E+00	2,00E-06	2,69E-06	8,72E-08	-8,11E-04
ADP-fossil resources	MJ	2,73E+03	4,83E+01	1,00E+02	2,88E+03	1,34E+02	5,37E+00	ND	ND	ND	9,99E+02	ND	1,02E+05	ND	0,00E+00	8,70E+00	4,47E+01	1,35E+00	-7,63E+02
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,09E+01	2,12E-01	5,40E+00	1,65E+01	5,95E-01	2,38E-01	ND	ND	ND	1,68E+01	ND	2,85E+03	ND	0,00E+00	4,28E-02	1,40E+00	3,89E-03	-1,19E+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	1,69E-05	2,33E-07	5,34E-07	1,76E-05	6,63E-07	3,59E-08	ND	ND	ND	2,40E-06	ND	9,05E-05	ND	0,00E+00	4,95E-08	8,26E-07	8,85E-09	-5,62E-06
Ionizing radiation <sup>6)</sup>	kBq 11235e	8,98E+00	5,19E-02	7,61E-01	9,79E+00	1,48E-01	1,79E-02	ND	ND	ND	3,62E+00	ND	2,85E+03	ND	0,00E+00	1,08E-02	2,54E-02	8,46E-04	3,36E+00
Ecotoxicity (freshwater)	CTUe	6,31E+03	7,75E+00	1,21E+03	7,53E+03	1,60E+01	3,57E+01	ND	ND	ND	2,38E+03	ND	1,41E+05	ND	0,00E+00	1,22E+00	4,92E+01	1,13E-01	-2,08E+02
Human toxicity, cancer	CTUh	3,75E+00	6,31E-10	1,30E-08	3,75E+00	1,75E-09	3,00E-10	ND	ND	ND	5,50E-08	ND	1,32E-06	ND	0,00E+00	1,05E-10	2,06E-09	1,01E-11	-1,34E-08
Human tox. non-cancer	CTUh	9,87E+00	2,61E-08	7,38E-08	9,87E+00	7,36E-08	1,42E-08	ND	ND	ND	5,50E-07	ND	7,18E-05	ND	0,00E+00	5,47E-09	6,68E-08	2,32E-10	-6,55E-07
SQP <sup>7)</sup>	-	5,91E+02	2,29E+01	1,03E+03	1,65E+03	6,58E+01	4,66E+00	ND	ND	ND	1,46E+02	ND	1,99E+04	ND	0,00E+00	5,44E+00	4,05E+00	2,65E+00	-5,93E+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 <sup>8)</sup>	MJ	1,29E+02	7,22E-01	2,06E+02	3,36E+02	2,04E+00	-1,71E+02	ND	ND	ND	4,37E+01	ND	2,75E+04	ND	0,00E+00	1,48E-01	4,30E-01	1,30E-02	-8,91E+01
Renew. PER as material	MJ	1,27E-02	0,00E+00	1,45E+02	1,45E+02	0,00E+00	-1,45E+02	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	-1,27E-02	0,00E+00	7,26E+01
Total use of renew. PER	MJ	1,29E+02	7,22E-01	3,51E+02	4,81E+02	2,04E+00	-3,16E+02	ND	ND	ND	4,37E+01	ND	2,75E+04	ND	0,00E+00	1,48E-01	4,17E-01	1,30E-02	-1,65E+01
Non-re. PER as energy	MJ	2,60E+03	4,83E+01	8,60E+01	2,73E+03	1,34E+02	-8,66E+00	ND	ND	ND	3,57E+02	ND	1,02E+05	ND	0,00E+00	8,70E+00	-2,50E+02	1,35E+00	-7,64E+02
Non-re. PER as material	MJ	2,83E+02	0,00E+00	2,56E+01	3,08E+02	0,00E+00	-2,56E+01	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	-2,82E+02	-3,99E-01	2,44E+00
Total use of non-re. PER	MJ	2,88E+03	4,83E+01	1,12E+02	3,04E+03	1,34E+02	-3,43E+01	ND	ND	ND	3,57E+02	ND	1,02E+05	ND	0,00E+00	8,70E+00	-5,32E+02	9,47E-01	-7,61E+02
Secondary materials	kg	1,32E+01	2,17E-02	3,55E+00	1,68E+01	6,07E-02	4,68E-03	ND	ND	ND	2,24E-01	ND	1,64E+01	ND	0,00E+00	3,96E-03	2,05E-02	3,39E-04	4,84E+01
Renew. secondary fuels	MJ	3,01E-02	2,22E-04	3,83E+00	3,86E+00	6,46E-04	4,45E-05	ND	ND	ND	2,13E-03	ND	1,41E-01	ND	0,00E+00	5,01E-05	1,59E-04	7,01E-06	-6,96E-03
Non-ren. secondary fuels	MJ	1,09E-01	0,00E+00	0,00E+00	1,09E-01	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 <sup>3</sup>	7,87E+01	5,72E-03	7,84E-02	7,88E+01	1,61E-02	-1,03E-02	ND	ND	ND	4,37E-01	ND	6,63E+01	ND	0,00E+00	1,18E-03	2,49E-02	1,40E-03	-1,35E-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	7,20E+00	6,76E-02	5,08E-01	7,78E+00	1,86E-01	5,90E-02	ND	ND	ND	4,01E+00	ND	2,47E+02	ND	0,00E+00	1,26E-02	3,73E-01	1,49E-03	-2,77E+01
Non-hazardous waste	kg	3,42E+02	1,33E+00	1,32E+01	3,57E+02	3,68E+00	1,30E+01	ND	ND	ND	1,86E+02	ND	2,08E+04	ND	0,00E+00	2,64E-01	9,69E+00	3,40E-02	-2,19E+02
Radioactive waste	kg	1,34E-02	1,29E-05	1,91E-04	1,36E-02	3,66E-05	4,51E-06	ND	ND	ND	7,38E-04	ND	7,31E-01	ND	0,00E+00	2,69E-06	6,28E-06	2,06E-07	8,73E-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 re-use	kg	4,13E-03	0,00E+00	0,00E+00	4,13E-03	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	7,94E-02	0,00E+00	1,33E+00	1,41E+00	0,00E+00	5,46E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	ND	0,00E+00	0,00E+00	5,06E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	1,86E-03	0,00E+00	6,04E-01	6,06E-01	0,00E+00	3,16E+00	ND	ND	ND	1,03E+01	ND	0,00E+00	ND	0,00E+00	0,00E+00	8,10E+00	0,00E+00	0,00E+00
Exported energy	MJ	2,09E-03	0,00E+00	0,00E+00	2,09E-03	0,00E+00	1,47E+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	6,19E+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
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,51E+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

### 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 <sub>2</sub> e	2,13E+02	3,53E+00	8,99E+00	2,25E+02	9,75E+00	1,84E+00	ND	ND	ND	7,63E+01	ND	4,42E+03	ND	0,00E+00	6,14E-01	2,27E+01	5,44E-02	-8,41E+01
Ozone depletion Pot.	kg CFC <sub>11</sub> e	2,34E-05	5,14E-08	2,09E-07	2,37E-05	1,46E-07	5,00E-09	ND	ND	ND	4,75E-05	ND	6,98E-05	ND	0,00E+00	9,62E-09	4,37E-08	1,26E-09	-3,00E-07
Acidification	kg SO <sub>2</sub> e	6,75E-01	2,64E-02	4,06E-02	7,42E-01	6,96E-02	1,69E-03	ND	ND	ND	1,83E-01	ND	2,17E+01	ND	0,00E+00	1,48E-03	2,31E-02	2,88E-04	-2,71E-01
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	2,58E-01	3,84E-03	9,95E-02	3,61E-01	1,03E-02	8,95E-04	ND	ND	ND	5,34E-01	ND	2,95E+00	ND	0,00E+00	3,75E-04	5,81E-03	9,15E-05	-4,97E-02
POCP (“smog”)	kg C <sub>2</sub> H <sub>4</sub> e	8,34E-02	1,60E-03	3,52E-03	8,86E-02	4,28E-03	2,53E-04	ND	ND	ND	1,78E-02	ND	1,17E+00	ND	0,00E+00	1,40E-04	1,70E-03	2,72E-05	-4,27E-02
ADP-elements	kg Sbe	1,89E-02	9,43E-06	2,83E-05	1,90E-02	2,63E-05	1,58E-06	ND	ND	ND	4,13E-04	ND	5,97E-02	ND	0,00E+00	1,96E-06	2,24E-06	8,55E-08	-8,10E-04
ADP-fossil	MJ	8,67E+05	4,75E+01	9,03E+01	8,67E+05	1,31E+02	5,07E+00	ND	ND	ND	9,52E+02	ND	5,15E+04	ND	0,00E+00	8,52E+00	4,43E+01	1,33E+00	-8,25E+02

## 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	4,81E-04	3,26E-06	3,28E-05	5,17E-04	9,18E-06	1,14E-06	ND	ND	ND	1,96E-04	ND	1,64E-01	ND	0,00E+00	6,72E-07	1,80E-06	5,94E-08	1,61E-04
Radioactive waste, int/low	kg	1,33E-03	9,61E-06	1,58E-04	1,50E-03	2,74E-05	3,36E-06	ND	ND	ND	5,43E-04	ND	5,67E-01	ND	0,00E+00	2,02E-06	4,48E-06	1,47E-07	7,12E-04

## 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	1,74E-03	8,76E-06	2,89E-06	1,76E-03	2,63E-05	3,74E-07	ND	ND	ND	1,76E-05	ND	0,00E+00	ND	0,00E+00	1,93E-06	1,09E-06	8,55E-08	-8,10E-04
Hazardous waste disposed	kg	6,31E+00	6,76E-02	5,69E-01	6,95E+00	1,86E-01	5,90E-02	ND	ND	ND	4,01E+00	ND	2,47E+02	ND	0,00E+00	1,26E-02	3,73E-01	1,49E-03	-2,77E+01
Non-haz. waste disposed	kg	3,40E+02	1,33E+00	1,03E+01	3,52E+02	3,68E+00	1,30E+01	ND	ND	ND	1,86E+02	ND	2,08E+04	ND	0,00E+00	2,64E-01	9,69E+00	3,40E-02	-2,19E+02
Air pollution	m <sup>3</sup>	5,60E+04	6,50E+02	1,77E+03	5,84E+04	1,81E+03	1,12E+02	ND	ND	ND	1,71E+04	ND	1,41E+06	ND	0,00E+00	1,16E+02	5,86E+02	1,25E+01	-4,00E+04
Water pollution	m <sup>3</sup>	6,12E+02	2,60E+01	5,76E+01	6,95E+02	7,26E+01	2,66E+00	ND	ND	ND	5,03E+02	ND	8,42E+04	ND	0,00E+00	4,77E+00	2,27E+01	6,84E-01	3,34E+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 <sup>9)</sup>	kg CO <sub>2</sub> e	2,12E+02	3,55E+00	8,88E+00	2,24E+02	9,81E+00	1,32E+00	ND	ND	ND	7,68E+01	ND	4,43E+03	ND	0,00E+00	6,18E-01	2,27E+01	5,49E-02	-8,46E+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 – CH<sub>4</sub> fossil, CH<sub>4</sub> 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 CO<sub>2</sub> 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 <sub>2</sub> e	2,11E+02	3,50E+00	8,98E+00	2,24E+02	9,66E+00	1,78E+00	ND	ND	ND	7,59E+01	ND	4,39E+03	ND	0,00E+00	6,08E-01	2,27E+01	5,35E-02	-8,32E+01
Ozone Depletion	kg CFC <sub>11</sub> e	1,49E-02	6,80E-08	2,81E-07	1,49E-02	1,93E-07	6,48E-09	ND	ND	ND	6,35E-05	ND	8,67E-05	ND	0,00E+00	1,27E-08	5,71E-08	1,68E-09	-3,35E-07
Acidification	kg SO <sub>2</sub> e	1,00E+00	2,88E-02	4,35E-02	1,07E+00	7,60E-02	2,05E-03	ND	ND	ND	6,06E-01	ND	2,08E+01	ND	0,00E+00	1,72E-03	3,03E-02	3,51E-04	-2,89E-01
Eutrophication	kg Ne	1,70E-01	1,62E-03	4,21E-02	2,14E-01	4,37E-03	1,30E-03	ND	ND	ND	2,44E-01	ND	3,84E+00	ND	0,00E+00	1,87E-04	2,85E-03	3,91E-05	-4,38E-02
POCP ("smog")	kg O <sub>3</sub> e	1,03E+01	6,05E-01	6,00E-01	1,15E+01	1,61E+00	5,32E-02	ND	ND	ND	2,98E+00	ND	2,02E+02	ND	0,00E+00	4,54E-02	9,89E-01	1,00E-02	-4,64E+00
ADP-fossil	MJ	9,89E+01	4,56E+01	1,86E+00	1,46E+02	1,34E+02	1,64E+00	ND	ND	ND	4,19E+01	ND	0,00E+00	ND	0,00E+00	8,60E+00	4,09E+01	1,35E+00	-7,66E+02

## SCENARIO DOCUMENTATION

### DATA SOURCES

#### Manufacturing energy scenario documentation

Scenario parameter	Value
District heating data source and quality	District Heat, Finland, 2022, Finland, One Click LCA
District heating kg CO <sub>2</sub> e / kWh	0,18 kg CO <sub>2</sub> e / kWh
Electricity data source and quality	Electricity production, hydro, run-of-river, Finland, Ecoinvent
Electricity kg CO <sub>2</sub> e / kWh	0,0044 kgCO <sub>2</sub> e / 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	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	0,00E+00
Volume capacity utilization factor	<1

### Installation scenario documentation - A5

Scenario parameter	Value
Treatment of waste packaging paper, municipal incineration, Ecoinvent, Materials for energy recovery	0,27 kg
Exported Energy: Electricity, Ecoinvent	0,61 MJ
Exported Energy: Electricity, Ecoinvent	5,5831 MJ
Exported Energy: Thermal, Ecoinvent	0,84 MJ
Exported Energy: Thermal, Ecoinvent	7,67 MJ
Treatment of waste packaging paper, sanitary landfill, Ecoinvent	0,3 kg
Treatment of waste paper, unsorted, sorting, Ecoinvent, Materials for recycling	2,7921 kg
Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, Materials for energy recovery	0,386 kg
Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling	2,67 kg
Treatment of waste wood, untreated, municipal incineration, Ecoinvent, Materials for energy recovery	2,5 kg
Treatment of waste wood, untreated, sanitary landfill, Ecoinvent	3,17 kg

### Use stages scenario documentation - B4

Scenario information	Value
Polyethylene production, low density, granulate, Ecoinvent	0,206 kg
Acrylonitrile butadiene styrene (ABS), Plastics Europe	1,03 kg
Polyurethane adhesive production, Ecoinvent	4,532 kg
Polyester fibre production, finished, Ecoinvent	0,515 kg
Polyester fibre production, finished, Ecoinvent	4,017 kg
Treatment of municipal solid waste, sanitary landfill, Ecoinvent	10,3 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 climates 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, total 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

Scenario information	Value
Treatment of electronics scrap from control units, Ecoinvent, Materials for recycling	0,264 kg
Treatment of used cable, Ecoinvent, Materials for recycling	0,531 kg
Treatment of scrap steel, inert material landfill, Ecoinvent	8,79 kg
Treatment of waste reinforcement steel, recycling, Ecoinvent, Materials for recycling	49,82 kg
Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, Materials for energy recovery	8,095 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  
30.01.2026

