ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

G-Eco Core 40 Inverter heat pump with R290 refrigerant
Gebwell Oy

EPD HUB, HUB-5091
Published on 24.01.2026, last updated on 24.01.2026, valid until 23.01.2031

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.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Gebwell Oy
Address	Patruunapolku 5, Finland
Contact details	info@gebwell.fi
Website	www.gebwell.fi

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	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	Tiina Vatanen, Gebwell Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Yazan Badour, as authorized verifier acting for EPD HUB Limited

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	G-Eco Core 40 Inverter heat pump with R290 refrigerant
Additional labels	-
Product reference	-
Place(s) of raw material origin	Europe
Place of production	Finland
Place(s) of installation and use	Europe
Period for data	Calendar year 2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	6430079400762
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	41,5

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of finished product
Declared unit mass	371 kg
Mass of packaging	9,92 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	3590
GWP-total, A1-A3 ($kgCO_2e$)	3600
Secondary material, inputs (%)	20,6
Secondary material, outputs (%)	73,5
Total energy use, A1-A3 (kWh)	13800
Net freshwater use, A1-A3 (m^3)	58,7

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Gebwell Oy, part of the Gebwell Group, is a Finnish company located in Leppävirta, specializing in the manufacturing of equipment for district heating and geothermal heating and cooling. All products—including ground source heat pumps, storage tanks, and district heating substations—are designed and produced in the company's facilities in Leppävirta. Gebwell's product development focuses on reliability and solutions tailored to the demanding Nordic climate. The company's vision is to be a forerunner in the heat pump and district heating sector, providing innovative answers to energy challenges.

PRODUCT DESCRIPTION

Gebwell G-Eco Core is an inverter-driven heat pump designed for use with the natural refrigerant R290 (propane). R290 is a hydrocarbon refrigerant with a Global Warming Potential (GWP) of 0.02 and an Ozone Depletion Potential (ODP) of 0.

The unit uses a continuously variable inverter-controlled compressor, allowing the heat output to modulate according to the building's real-time thermal load. Inverter control ensures stable operation without unnecessary cycling, improving part-load efficiency and maintaining consistent supply temperatures.

G-Eco Core can be integrated into the Gebwell Smart cloud environment. Through the browser-based Smart Hub interface, system parameters, operating states, alarms, and controller settings can be monitored and adjusted remotely. Remote access also allows firmware updates to be applied without on-site intervention. Operational data stored in the cloud can be used for diagnostics and long-term performance analysis.

The compressor module of the G-Eco Core is structurally isolated to reduce mechanical transmission and airborne noise. The entire refrigeration circuit is designed specifically for R290 operation, including component selection, safety structures, and charge optimisation.

Gebwell G-Eco Core is an inverter-driven heat pump that includes the pumping system. External components required for ground heating—such as pipes and the ground well—are not included in this product. These elements are considered part of the construction project.

Further information can be found at:
www.gebwell.fi

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	88,3	Europe
Minerals	0	-
Fossil materials	11,7	Europe
Bio-based materials	0	-

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	5,21

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of finished product
Mass per declared unit	371 kg
Functional unit	1 unit
Reference service life	20

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

Modules not declared = ND. Modules not relevant = MNR

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 reference product consists of units that are made of metals, plastics and electronic components. The materials are transported to Gebwell production facility, where the main manufacturing processes include soldering, assembly, software programming and testing. Eco-friendly refrigerant R290 is used in the product. R290 is a hydrocarbon that has a minimal impact on global warming compared to traditional hydrofluorocarbon (HFC) refrigerants.
The manufacturing process requires electricity for the different equipment. The manufacturing energy is considered based on the electricity mix of the manufacturing site, energy source and country of electricity generation. Certain ancillary materials are also included.

The study considers the losses of main raw materials occurring during the manufacturing process. Each part of the manufacturing process is considered separately, and waste disposal of the process is accounted based on allocation of factory level waste. Production consists of soldering and assembly work mainly using tools and lifts. Therefore, production waste and energy requirements are quite minimal.

We adhere to strict quality standards at every stage of our production process. Our quality management system is certified in accordance with ISO 9001 and ISO 14001.
For transportation from the factory, the product is packaged using wooden pallets, Styrofoam corner protectors, and packaging film.

TRANSPORT AND INSTALLATION (A4-A5)

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

A4: Based on a minimum transport distance of 21 km and a maximum of 2,500 km to customers, an average transport distance of 348 km has been used. That well represents the typical transport distance within the Finnish and Europe markets. The transportation method is lorry. A vehicle capacity utilization rate of 100% (full load) is assumed. While actual load rates may vary, their impact is considered negligible due to the minor role of transportation emissions in the overall results. To ensure a conservative estimate, empty return trips are included, as modeled in the ecoinvent database. No product losses occur during transport, as the products are properly packaged.

A5: Gebwell does not carry out on-site installation. As installation practices vary depending on the site and are carried out under responsibility of builder. This phase has been excluded from the assessment. However, the environmental impacts related to packaging waste generated during installation are included in this stage (A5). All packaging waste is collected and transported for further treatment. An average transport distance of 50 km by freight transport to further treatment is assumed for all packaging waste streams.

- Steel packaging: 81% is recycled, and 19% is landfilled. No incineration is reported.
- Plastic packaging: 40% is recycled, 37% is incinerated with energy recovery, and 23% is landfilled.
- Wooden packaging: 32% is recycled, 30% is incinerated with energy recovery, and 38% is landfilled.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1: Consumption of energy and natural resources in demolition process is assumed to be negligible.

C2-C4: Waste materials are transported to appropriate treatment facilities. The transport scenario assumes an average distance of 50 km by truck, in line with EN 15804 recommendations. Transportation emissions are included in the life cycle assessment. Materials are sorted, compacted, and prepared for recycling, incineration, or disposal. The following treatment scenarios are applied:

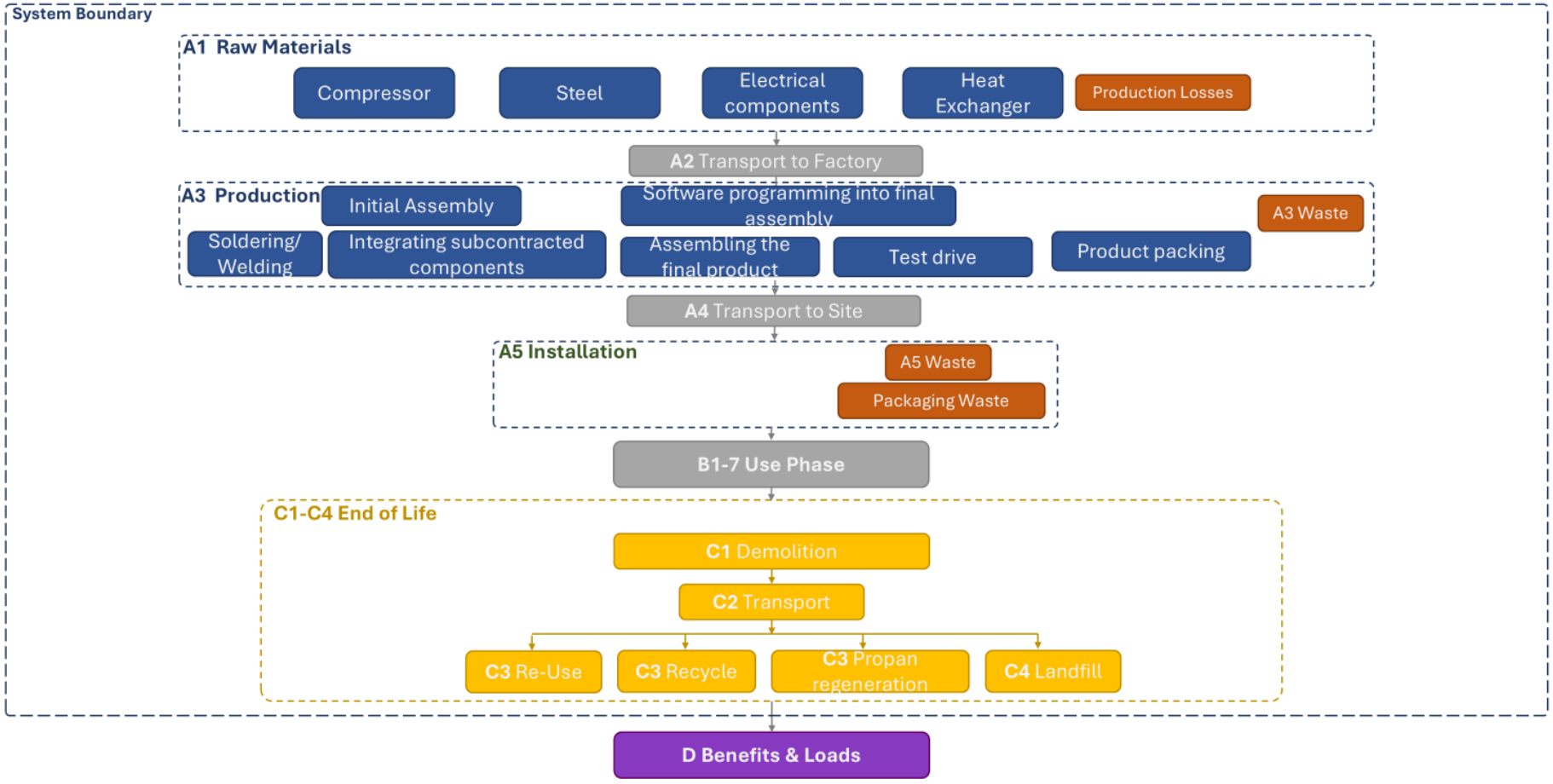
- Steel & Galvanized Steel: 85% recycled, 15% landfilled.
- Stainless Steel: 95% recycled. Copper and brass: 80% recycled, 20% landfilled.
- Aluminium: ~70% recycled. Assumption based on general aluminium recycling rates.
- Plastics: 50% of plastic waste is incinerated with energy recovery and 25% is incinerated without energy recovery and 25% landfilled.

Electronics waste is treated through a combination of recycling, incineration, and landfilling, depending on the material composition. Exported energy, both electricity and thermal, is calculated based on established efficiency metrics.
Residual materials that are not suitable for recycling or energy recovery are sent to landfill:

- Steel & Metals: 5–15% of total mass landfilled depending on material type.
- Plastics: 25% landfilled.

D: Due to the material and energy recovery potential of components in the end-of-life product and packaging, recycled raw materials lead to avoided virgin material production. Additionally, energy recovered through incineration offsets electricity and heat production (D). These benefits and associated environmental loads are accounted for in Module

SYSTEM DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

Materials excluded from the study (A1): Total amount of materials excluded is 0,38%. That is divided as follows: Stickers: 0.019%, electronic components: 0.191% and other metals: 0.173%. These materials have been excluded due to their negligible mass or lack of sufficient data. Cut-off criteria were applied accordingly.

Excluded life cycle stages:
The EPD excludes stages B1–B7. These stages, including energy consumption, are highly site-specific and may vary significantly depending on location, operational circumstances, and specific parameters.

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	Allocated by mass or volume
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, %	-

There is no average result considered in this study since this EPD refers to one specific product produced in one production plant.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD System Verification 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'.

1. https://worldsteel.org/wp-content/uploads/Life-cycle-inventory-LCI-study-2020-data-release.pdf
2. https://www.worldstainless.org/about-stainless/environment/recycling/#:~:text=The%20analysis%20concluded%20that%20on,in%20English%2C%20German%20and%20Chinese.
3. International Chromium Development Association (ICDA) 2023 https://www.icdacr.com/2023/06/27/95-of-stainless-steel-is-recycled-at-the-end-of-its-life/
4. Copper, aluminium, steel, ferrous metals waste and other other non-ferrous metals waste and glass recycling rates rates are considered according to EN 50693.
5. Brass Recycling rate is considered according to Copper Alliance (2021).
6. Plastics Europe (2020) https://plasticseurope.org/knowledge-hub/plastics-the-facts-2020/;
7. C2 transport: 50 km assumed (source: Gervasio, H. & Dimova, S., JRC Technical report: Model for Life Cycle Assessment (LCA) of buildings, 2018)
8. Equanimator Ltd for Zero Waste Europe, 2023 https://zerowasteeurope.eu/wp-content/uploads/2023/01/Debunking-Efficient-Recovery-Full-Report-EN.docx.pdf
9. Bitumen European waterproofing association (EWA) EPD, 2022 (expert judgement assumption by EWA Technical Committee)
10. EUROSTAT – Packaging Waste Statistics:
- Steel: https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_13967225
https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519242
https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174
12. Debunking Efficient Recovery: The Performance of EU Incineration Facilities, 2023
- https://zerowasteeurope.eu/wp-content/uploads/2023/01/Debunking-Efficient-Recovery-Full-Report-EN.d…

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	3,17E+03	1,69E+01	4,16E+02	3,60E+03	1,43E+01	2,00E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,47E+01	5,69E+01	3,85E+01	-4,80E+02
GWP – fossil	kg CO_2e	3,14E+03	1,69E+01	4,34E+02	3,59E+03	1,43E+01	8,95E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,47E+01	5,70E+01	3,85E+01	-4,75E+02
GWP – biogenic	kg CO_2e	2,11E+01	3,66E-03	-1,90E+01	2,12E+00	3,23E-03	1,91E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,22E-03	-1,64E-02	-8,12E-04	-4,43E+00
GWP – LULUC	kg CO_2e	5,29E+00	9,76E-03	1,65E-01	5,47E+00	6,38E-03	4,96E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,52E-03	8,15E-03	2,64E-03	-1,19E+00
Ozone depletion pot.	kg CFC_{-11}e	7,13E-04	2,51E-07	9,45E-06	7,23E-04	2,11E-07	5,50E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,06E-07	9,98E-08	2,05E-07	-2,42E-06
Acidification potential	mol H^+e	2,58E+01	5,75E-02	2,12E+00	2,80E+01	4,87E-02	1,89E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,91E-02	8,45E-02	3,08E-02	-3,42E+00
EP-freshwater[2)]	kg Pe	1,02E+01	1,31E-03	1,38E-01	1,04E+01	1,11E-03	8,92E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,15E-03	4,57E-03	7,36E-04	-8,42E-01
EP-marine	kg Ne	4,33E+00	1,89E-02	3,21E-01	4,67E+00	1,60E-02	1,94E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,59E-02	2,20E-02	2,92E-02	-6,74E-01
EP-terrestrial	mol Ne	4,26E+01	2,06E-01	5,21E+00	4,80E+01	1,74E-01	7,67E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,73E-01	2,34E-01	1,06E-01	-8,34E+00
POCP ("smog")[3)]	kg NMVOCe	1,28E+01	8,47E-02	1,10E+00	1,40E+01	7,17E-02	2,50E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,84E-02	6,71E-02	4,42E-02	-2,27E+00
ADP-minerals & metals[4)]	kg Sbe	1,74E+02	4,72E-05	5,35E-04	1,74E+02	3,98E-05	1,13E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,83E-05	4,39E-04	2,34E-05	-3,91E-02
ADP-fossil resources	MJ	3,88E+04	2,45E+02	6,08E+03	4,51E+04	2,07E+02	4,74E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,07E+02	9,24E+01	1,65E+02	-4,73E+03
Water use[5)]	m^3e depr.	1,84E+03	1,21E+00	1,38E+02	1,98E+03	1,02E+00	1,36E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,60E-01	4,32E+00	1,93E+00	-1,72E+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	1,60E-04	1,68E-06	1,20E-05	1,73E-04	1,43E-06	3,29E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,17E-06	1,09E-06	4,20E-07	-3,82E-05
Ionizing radiation[6)]	kBq U235e	8,86E+02	2,15E-01	8,14E+01	9,68E+02	1,80E-01	1,33E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,68E-01	6,67E-01	1,26E-01	-2,75E+00
Ecotoxicity (freshwater)	CTUe	1,67E+05	3,69E+01	2,25E+03	1,69E+05	2,93E+01	1,81E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,27E+01	1,32E+02	5,42E+02	-1,38E+04
Human toxicity, cancer	CTUh	5,27E+01	2,79E-09	6,67E-08	5,27E+01	2,36E-09	1,90E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,50E-09	9,58E-09	1,92E-08	-3,10E-07
Human tox. non-cancer	CTUh	1,39E+02	1,59E-07	3,50E-06	1,39E+02	1,34E-07	9,63E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,29E-07	4,99E-07	1,38E-07	-1,07E-05
SQP[7)]	-	1,40E+04	2,45E+02	3,39E+03	1,76E+04	2,09E+02	4,74E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,24E+02	1,64E+02	3,46E+01	-2,20E+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 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	4,74E+03	3,38E+00	2,82E+02	5,03E+03	2,84E+00	-1,32E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,84E+00	1,55E+01	2,23E+00	-8,18E+02
Renew. PER as material	MJ	1,44E+02	0,00E+00	9,55E+01	2,39E+02	0,00E+00	-9,55E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-7,18E+01	-7,18E+01	3,62E+01
Total use of renew. PER	MJ	4,89E+03	3,38E+00	3,77E+02	5,27E+03	2,84E+00	-2,28E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,84E+00	-5,62E+01	-6,95E+01	-7,82E+02
Non-re. PER as energy	MJ	3,85E+04	2,45E+02	5,89E+03	4,46E+04	2,07E+02	-1,39E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,07E+02	-6,45E+02	-5,27E+02	-4,73E+03
Non-re. PER as material	MJ	7,02E+02	0,00E+00	1,38E+01	7,16E+02	0,00E+00	-1,87E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-2,87E+02	-4,10E+02	1,15E+01
Total use of non-re. PER	MJ	3,92E+04	2,45E+02	5,91E+03	4,53E+04	2,07E+02	-3,26E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,07E+02	-9,32E+02	-9,38E+02	-4,72E+03
Secondary materials	kg	7,56E+01	1,04E-01	7,46E-01	7,64E+01	8,82E-02	3,77E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,29E-02	1,11E-01	7,62E-02	2,09E+02
Renew. secondary fuels	MJ	1,37E+00	1,32E-03	7,79E-02	1,45E+00	1,12E-03	4,46E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,18E-03	4,92E-03	4,94E-04	-6,64E-02
Non-ren. secondary fuels	MJ	1,16E+00	0,00E+00	0,00E+00	1,16E+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	5,25E+01	3,63E-02	6,11E+00	5,87E+01	3,06E-02	-1,16E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,74E-02	9,22E-02	-4,26E-04	-4,33E+00

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	3,25E+02	4,14E-01	3,73E+01	3,62E+02	3,51E-01	3,49E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,60E-01	1,40E+00	6,80E-01	-1,65E+02
Non-hazardous waste	kg	9,90E+03	7,67E+00	7,60E+02	1,07E+04	6,49E+00	2,08E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,75E+00	4,01E+01	7,66E+01	-9,25E+02
Radioactive waste	kg	3,54E-01	5,26E-05	2,07E-02	3,74E-01	4,42E-05	3,32E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,11E-05	1,70E-04	3,08E-05	-6,91E-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	4,27E-02	0,00E+00	0,00E+00	4,27E-02	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	3,07E+01	0,00E+00	0,00E+00	3,07E+01	0,00E+00	3,43E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,73E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	1,52E+00	0,00E+00	3,45E-03	1,53E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	7,35E-01	0,00E+00	0,00E+00	7,35E-01	0,00E+00	1,71E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,10E+02	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	7,18E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,83E+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	9,87E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,22E+02	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	3,15E+03	1,69E+01	4,35E+02	3,60E+03	1,43E+01	8,95E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,47E+01	5,70E+01	3,85E+01	-4,76E+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.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, medium voltage, residual mix, Finland, Ecoinvent
Electricity CO2e / kWh	0,66kg
District heating data source and quality	District Heat, Finland, 2022, Finland, One Click LCA,
District heating CO2e / kWh	0.18kg
Propane data source and quality	Propane, burned in building machine, World, Ecoinvent
Propane CO2e/MJ	0.0945 kg

Transport scenario documentation - A4 (Transport resources)

Scenario parameter	Value
Fuel and vehicle type	Market for transport, freight, lorry >32 metric ton, EURO5
Average transport distance, km	348
Capacity utilization (including empty return) %	50
Bulk density of transported products	0,00E+00
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation waste)

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	0
Water use / m³	0
Other resource use / kg	0
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	0
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Wood: 9,0 kg Plastic: 0,46 kg Steel: 0,46 kg
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	Wood: 32 % recycled, 30 % incinerated, 38 % land filled. Plastic:40 % recycled, 37 % incinerated, 23 % land filled. Metal scrap: 81 % recycled, 19 % land filled.
Direct emissions to ambient air, soil and water / kg	0

1. Treatment of metal scrap, mixed, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.37 kg
2. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.087 kg
3. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.18 kg
4. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 0.17 kg
5. Exported Energy: Electricity, Ecoinvent, 1.1546 MJ
6. Exported Energy: Electricity, Ecoinvent, 6.03 MJ

7. Exported Energy: Thermal, Ecoinvent, 1.5916 MJ
8. Exported Energy: Thermal, Ecoinvent, 8.28 MJ
9. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.11 kg
10. Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling, 2.88 kg
11. Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 2.7 kg
12. Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 3.42 kg

End of Life (EOL) scenario documentation - C1-C4 (Data source)

1. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 49.76 kg
2. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 164.16 kg
3. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 19.54 kg
4. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 1.854 kg
5. Treatment of scrap steel, inert material landfill, Ecoinvent, 8.781 kg
6. Treatment of scrap steel, inert material landfill, Ecoinvent, 28.969 kg
7. Treatment of scrap steel, inert material landfill, Ecoinvent, 1.029 kg
8. Treatment of scrap steel, inert material landfill, Ecoinvent, 8.62 kg
9. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.86 kg
10. Treatment of scrap steel, inert material landfill, Ecoinvent, 4.094 kg
11. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 12.93 kg
12. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 1.28 kg
13. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 5.99 kg
14. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 16.38 kg
15. Treatment of waste aluminium, sanitary landfill, Ecoinvent, 2.57 kg
16. Treatment of scrap steel, municipal incineration, Ecoinvent, 0.62 kg
17. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.62 kg
18. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.26 kg
19. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.03 kg
20. Treatment of waste bitumen sheet, municipal incineration, Ecoinvent, 0.77 kg
21. Exported Energy: Electricity, Ecoinvent, 4.87 MJ
22. Exported Energy: Electricity, Ecoinvent, 0.34 MJ
23. Exported Energy: Electricity, Ecoinvent, 79.089 MJ
24. Exported Energy: Electricity, Ecoinvent, 4.3 MJ
25. Exported Energy: Thermal, Ecoinvent, 6.69 MJ
26. Exported Energy: Thermal, Ecoinvent, 0.47 MJ
27. Exported Energy: Thermal, Ecoinvent, 108.99 MJ
28. Exported Energy: Thermal, Ecoinvent, 5.916 MJ
29. Treatment of waste bitumen, sanitary landfill, Ecoinvent, 0.69 kg
30. Treatment of waste polypropylene, municipal incineration, Ecoinvent, 0.066 kg
31. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.036 kg
32. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 16.075 kg
33. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 8.038 kg
34. Treatment of waste plastic, mixture, sanitary landfill, Ecoinvent, 8.038 kg
35. Treatment of waste plastic, mixture, sanitary landfill, Ecoinvent, 0.51 kg
36. Treatment of waste glass sheet, sorting plant, Ecoinvent, Materials for recycling, 0.51 kg
37. Treatment of waste glass, sanitary landfill, Ecoinvent, 0.34 kg
38. Treatment of waste rubber, unspecified, municipal incineration, Ecoinvent, 1.02 kg
39. Treatment of waste rubber, unspecified, municipal incineration, Ecoinvent, 0.51 kg
40. Treatment of waste mineral oil, hazardous waste incineration, Ecoinvent, 2.5 kg
41. Propane, burned in building machine, Ecoinvent, 83.52 MJ
42. Treatment of waste paint, hazardous waste incineration, Ecoinvent, 2.36 kg
43. Treatment of waste paint, sanitary landfill, Ecoinvent, 0.024 kg

Scenario information	Value
Scenario assumptions e.g. transportation	Transportation to landfill has been conservatively assumed as 50km by truck.

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 is filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub cannot 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

Yazan Badour, as authorized verifier acting for EPD HUB Limited
24.01.2026