Timberwise

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

MULTI-LAYER PARQUET

TIMBERWISE OY

EPD HUB, HUB-1629
Publishing date 21 June 2024, last updated on 21 June 2024, valid until 21 June 2029

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Timberwise Oy
Address	Juvantie 222, 32200 Loimaa, FINLAND
Contact details	info@timberwise.fi
Website	https://timberwise.fi/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Hanna Lento, Inkeri Saijets, Sweco Finland Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

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	Multi-layer parquet
Additional labels	Oak parquet, Pine parquet, Ash parquet, Douglas parquet, Birch parquet, Spruce parquet
Product reference	-
Place of production	Loimaa, Finland
Period for data	Calendar year 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	1 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m^2
Declared unit mass	9,7 kg
GWP-fossil, A1-A3 (kgCO2e)	1,53E+01
GWP-total, A1-A3 (kgCO2e)	1,06E+00
Secondary material, inputs (%)	0,05
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	150
Net fresh water use, A1-A3 (m3)	0,1

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Timberwise parquets are made of traceable, ethical and ecological real wood. Our parquets are manufactured from 3-layers of wood in Loimaa, Finland, from the highest quality raw material available. The result is a unique combination of Finnish expertise, style and safety. The floor is one of the largest surfaces in your home. It is present in every room, and you can feel it under your feet every day. Production started at Loimaa 1999. Long history has shaped and developed the product and production and the result of continuous improvement is even higher quality parquet.

PRODUCT DESCRIPTION

Parquet floorboards are glued from three layers of wood. The top layer is at least 2,5 mm thick solid wood of a preferred species. Core layer is a plywood. Bottom layer is a veneer. The parquet can be finished according to customer requirements. Options are a sanded or a brushed surface. The product can be delivered in multiple stained or primed shades. Finishing treatment can be a lacquer or a hard wax oil.

Surface treatment can be selected according to the final use and desired properties. Brushing and hard wax oil finish will result in less slippery and natural looking floor. Sanded and lacquered finish has easier maintenance and better durability in commercial spaces.

Wood, like many natural materials, is hygroscopic; it absorbs or gives off moisture from the surrounding environment. Moisture exchange between the wood and the air depends on the relative humidity and temperature of the air and the current amount of water in the wood. In the parquet floor this can be detected as swelling and shrinking of the floor. This movement is prevented by gluing the parquet to the subfloor. In the floating installation, you must leave enough room under the skirting boards to enable this movement. Moisture movements can also cause cracking and loose knots. Floating installation enables reuse. Floor can also be sanded one or two times to restart the lifecycle.

Parquets are wooden floor coverings for a private and a commercial use in indoor areas which are installed as a floating floor (WiseLoc) or glued down on existing subfloors such as wood or concrete. Type of tongue and groove profiling must be selected according to the desired installation method. The manufacturer's instructions must be followed in all cases.

This EPD presents the LCA of a representative product with oak wear layer, which totals appr. 83% of factory production. The EPD also includes products with alternative wood species used in the wear layer. Sensitivity analysis was conducted for the second largest production share with pine wear layer. The share of other products in production volume is low, and for all wood species applicable data to be used in sensitivity analysis was not available.

Further information can be found at https://timberwise.fi/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	
Minerals	0	
Fossil materials	3	Finland, EU
Bio-based materials	97	Finland, EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	3,13
Biogenic carbon content in packaging, kg C	0,061

DECLARED UNIT

Declared unit	1 m^2
Mass per declared unit	9,7 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

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

TECHNICAL SPECIFICATIONS

Thickness	14 – 15 mm
Wear layer thickness	≥ 2,5 mm
Width	150 – 270 mm (Design 80 – 185 mm)
Length	1818 - 2500 mm (Design 480 – 925 mm)
Wood species for wear layer	Oak (alternatives Ash, Douglas Fir, Birch, Spruce, Pine)
Adhesives	EPI
Moisture content	7 %
Density	680 kg/m3 or 9,8 kg/m2
Thermal conductivity	0,13 W/m K
Reaction to fire	Dfl-s1 (EN 14342:2005)
Formaldehyde emissions	E1 (M1 and JAS F****)
Service class	1

PRODUCT STANDARDS

The products require a declaration of performance including the harmonized EN 14342:2013 (Wood flooring and parquet - Characteristics, evaluation of conformity and marking) and CE labelling with DoP. EN 13489:2017 (Wood flooring - Multi-layer parquet) is relevant as a further product-specific standard.

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	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse Recovery Recycling

Modules not declared = MND. 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. This stage includes all raw materials which end up in the final products, except the UV oil and mono stain, as no applicable environmental data was available.

Raw materials, packaging and ancillary materials are transported to the manufacturing facility by truck and ship freight. The specific transport distances from the suppliers are used. Packaging materials of the final product are cardboard, shrink wrap and pet strap and the packaged products are delivered to customers on wood pallets. Pallets can be reused. Cardboard and shrink wrap contain recycled material. Ancillary materials include raw materials packaging (plastic, cardboard, and pallets). All raw material packaging contains recycled materials.

Oak timber is dried in the manufacturing process and mass of evaporated water is considered in the mass of transported oak. Part of the sawdust and dust that is formed in the manufacturing process is sold to local district heat producer and is considered as a byproduct. Production losses of raw materials are considered according to exact data from manufacturing process.

The mass and energy of a by-product generated in manufacturing phase is allocated by reducing the wastage percentage.

Manufacturing waste generated in the manufacturing facility from raw materials packaging is collected and recycled in the nearest waste treatment facility. The distance to the nearest waste treatment facility is 10 km.

Electricity source is a country specific residual electricity mix. The manufacturing facility also has solar panels on its roof, and all electricity from solar panels is used in the manufacturing facility.

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 distances and methods were provided by the Manufacturer. Transportation distances to the customers are weighted averages.

A large share of the packaged product goes to Asian market. The installation sites are calculated to be on average 355 km from the production facility by truck freight and 8 300 km by ship freight. Due to the long distances, full trailer combination truck is assumed to be used. No losses in transportation are expected. An assumption is that trucks are EURO 5 trucks which is the most common.

Environmental impacts from installation into the building (A5) include the product installation losses, emissions of energy use in installation and generation of waste at the construction site. Installation loss is assumed to be 10 %. This is based on the cut allowance recommended by the manufacturer. Installation waste is assumed to be collected and incinerated for energy. Waste treatment of the packaging material as well as incineration of the product installation loss are considered in A5. Manufacturing of the application tools is excluded and energy use of applying the product is assumed to be negligible. No additional transportation is expected at the application phase.

PRODUCT USE AND MAINTENANCE (B1-B7)

The use phase is not covered by this EPD.
In accordance with the current BNB Guidelines, the Reference Service Life of multilayer parquet is 40 years when installed and cared correctly (BNB Guideline, 11/2011). The period of use for multilayer parquet can be up to a whole century when maintained properly.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Floating installation enables reuse. Floor can also be sanded one or two times to extend the product lifespan. At the end of life (C1-C4) the wood product is incinerated, and energy is recovered in the process.

At the end-of-life phase the parquet is demolished. The energy consumption of demolition and de-construction are assumed to be negligible (C1). The demolished parquets are transported to a waste treatment facility. Transportation distance is assumed to be 50 kilometres and transportation method lorry, which is the most common (C2). At the facility, parquet is incinerated for energy (C3). It is assumed that waste processing of the parquet at the end of life is 100 % energy recovery by incineration. For parquet, the recycling as material is not considered. No disposal on landfills is assumed (C4).

Parquet has recovery potential (D) due to its high thermal value. Energy recovery reduces the need for alternative fuel use in energy production. The benefits of heat and electricity production from wood incineration are considered. The EOL scenarios is based on the incineration with more than 60 % efficiency in a CHP plant. Benefits of recycling waste generated in both A5 and C3 are considered in module D. The recycled PE and cardboard have been modelled to avoid use of primary materials.

MANUFACTURING PROCESS

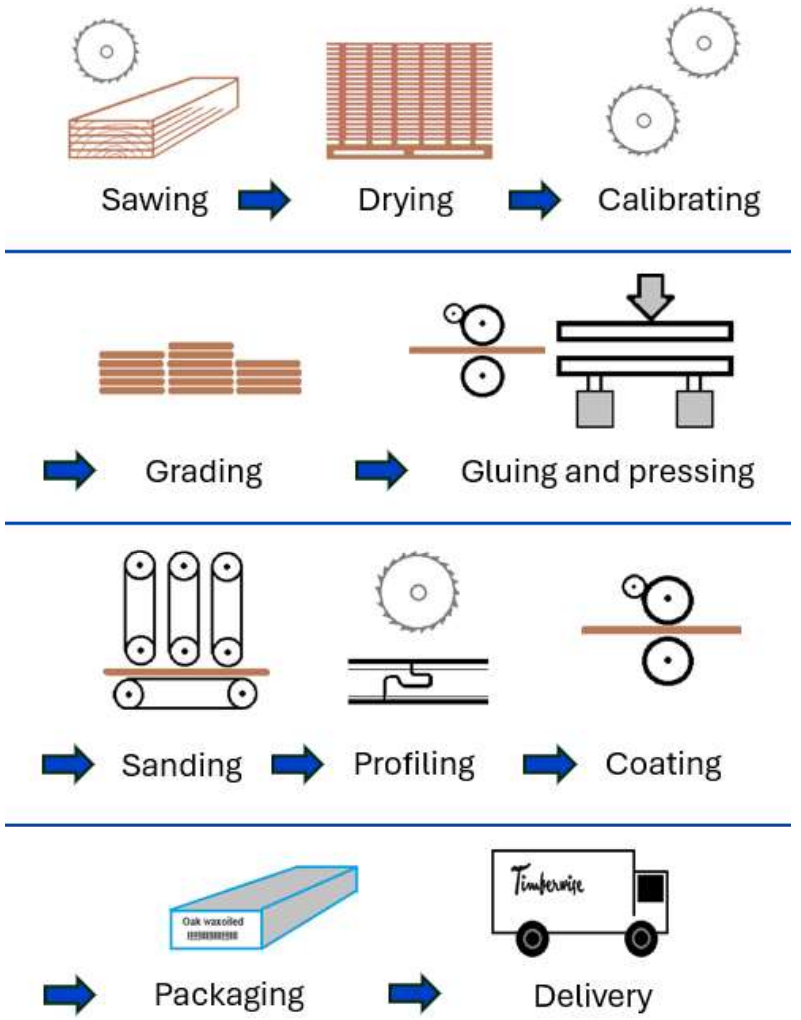
The wear layer is composed of solid wood element. Freshly cut wood or kiln-dried timber are used to manufacture the wear layer. The wear layer is sawn to desired dimensions and then dried to below 7 % of moisture. Thickness, width, and length are calibrated after drying with a planing machine. The finished surface blanks are sorted according to the base colour variation, the number of knots and the other natural defects of wood into different grades. Normal grades are Select, Classic and Vintage.

In addition, plywood and wood veneers are deployed. The layers are first manufactured separately. Individual layers are then pressed together after the adhesive has been applied. The glue is cured with heat.

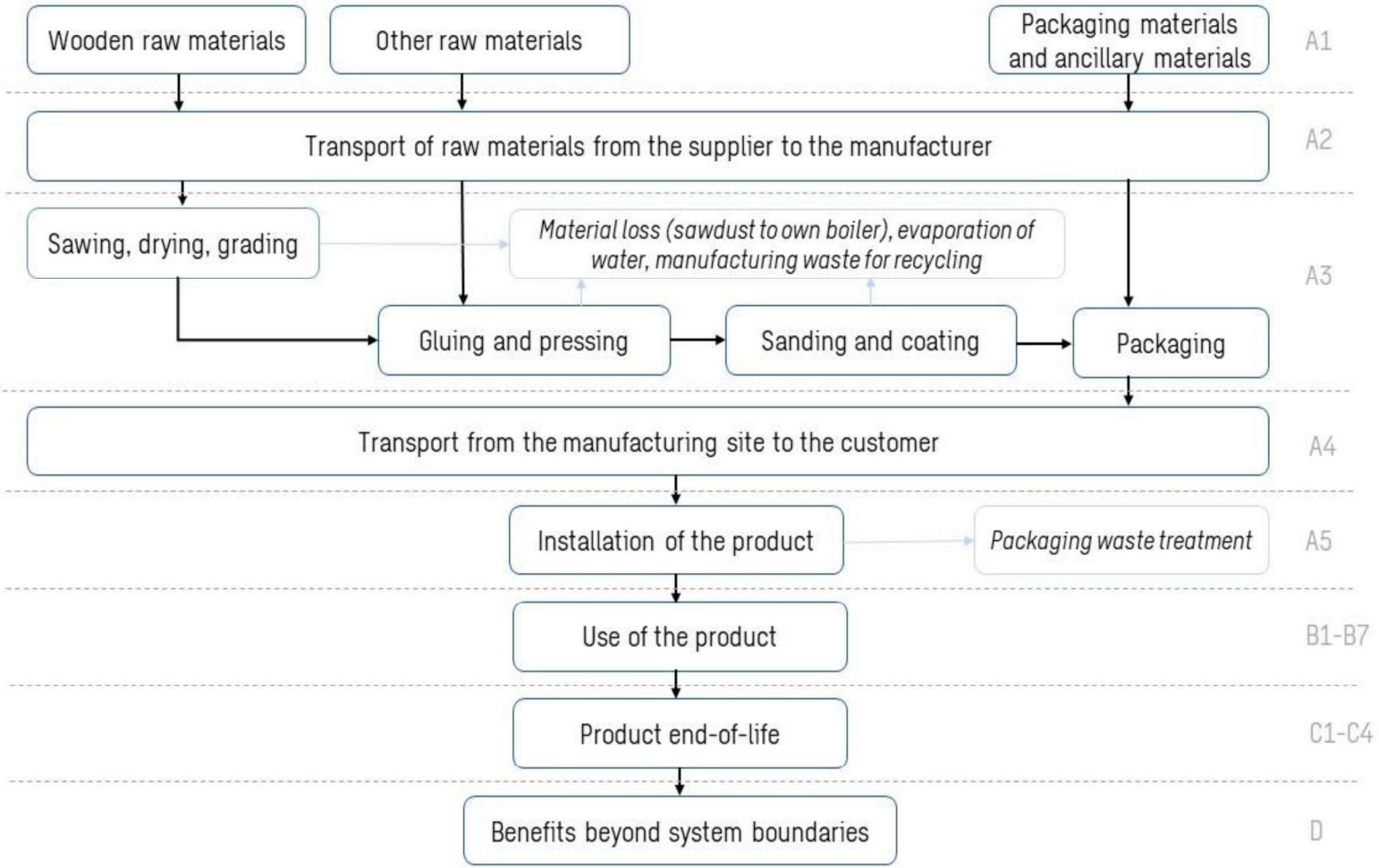
The parquet boards are then sanded after the possible defects are filled. Next the boards are profiled to tongue and groove on all four sides, according to the coming installation method.

Final step is to give the floor its desired shade and surface treatment. After sanding or brushing the wood grain visible the colour is stained or primed to the surface. The top layer of surface treatment is UV-hardening hard wax oil or lacquer.

Production process in inspected according to the quality control system build to the mill. The final inspection of the boards is done visually just before packaging. The finished parquet boards are packaged to cardboard and shrink plastic wrapping to ensure safe delivery to the customer.



LIFE CYCLE FLOW 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.

Construction of the production facility and equipment are excluded from the analysis, as their impacts divided by the amount of product produced during the factory and equipment lifetime are considered negligible. Support activities not directly linked to manufacturing, such as employee commuting, is excluded from the analysis.

Data regarding UV-oils and stain was not available. As their mass share is less than 1 % of the total mass of the product, their impacts can be assumed to be negligible, and they are excluded from the analysis.

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:

Modules A1-A3:
Data for wood raw materials and energy are allocated, since there is a by-product flow generated in the manufacturing phase. Some of the waste sawdust and dust is sold as fuel for district heating and is thus considered a byproduct. This is allocated by reducing the waste percentage based on the byproduct mass. The oak timber raw material is dried in the manufacturing process and the water evaporation is accounted for in the calculations.

Module A4:
The transportation distance is defined according to the weighted average of realized exports and delivery distances. Due to the long distances, full trailer combination truck is assumed to be used. Fill rate of 100% is used, as the transportation provider is assumed to provide their services to other customers on return trips.

Module A5:
Installation loss is assumed to be 10 % based on the cut allowance recommended by the manufacturer.

Module C1:
No energy consumption in the demolition/de-construction process is estimated.

Module C2:
After demolition the parquet is transported to the nearest construction waste treatment facility, which is assumed to be at 50 km distance. A lorry is assumed to be used. Fill rate of 50% is used, accounting for empty returns.

Module C3:
In the energy recovery scenario, the parquet is incinerated in combined heat and power plant (CHP). Total efficiency of approximately 60 % is used.

Module C4:
No disposal to landfill.

Module D:
Parquet is recovered as energy. Benefits of wood waste incineration are heat and electricity, which are taken into account in module D. Also, the benefits of reused pallets and bed timber, recycled PET, PE, and cardboard from A5 (packaging materials) are calculated. In the calculations, the share of recycled material used for these packaging materials are excluded to avoid double counting.

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	1 %

The representative product in this EPD is a parquet covered with oak timber surface. This product accounts for 82,7 % of the annual production volume at the plant. Other alternatives are ash, birch, douglas, spruce or pine covered parquets. Sensitivity analysis was conducted to assess the impacts of different surface wood layer options. Sensitivity analysis for pine covered parquet was done as the share of pine parquet production volume is the second largest, presenting approximately 11 % from the annual production volume at plant.

The production of pine parquet differs from oak parquet only regarding the raw materials in module A1, the transportation distance of pine in A2 and the location of wood drying. A mass of a parquet product and the three-layered structure of parquet remains the same with pine covered and oak covered parquet.

Sensitivity analysis was only conducted for pine parquet. The share of other products in production volume is low, and for all wood species applicable data to be used in sensitivity analysis was not available. All parquets are produced in the same plant in Loimaa, Finland.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

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	-9,75E+00	8,13E-01	1,00E+01	1,06E+00	2,72E+00	2,03E+00	MND	MND	MND	MND	MND	MND	MND	MNR	2,08E-01	1,42E+01	0,00E+00	-1,26E+01
GWP – fossil	kg CO_2e	5,77E+00	8,12E-01	8,70E+00	1,53E+01	2,72E+00	1,83E+00	MND	MND	MND	MND	MND	MND	MND	MNR	2,08E-01	1,49E-01	0,00E+00	-9,23E+00
GWP – biogenic	kg CO_2e	-1,55E+01	3,69E-05	1,29E+00	-1,42E+01	0,00E+00	1,95E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,40E+01	0,00E+00	-3,36E+00
GWP – LULUC	kg CO_2e	1,03E-02	3,31E-04	1,16E-03	1,18E-02	1,53E-03	1,34E-03	MND	MND	MND	MND	MND	MND	MND	MNR	9,78E-05	4,85E-05	0,00E+00	-1,48E-02
Ozone depletion pot.	kg $CFC_{-11}e$	1,99E-07	1,87E-07	5,00E-07	8,86E-07	5,78E-07	1,50E-07	MND	MND	MND	MND	MND	MND	MND	MNR	4,67E-08	1,03E-08	0,00E+00	-5,08E-07
Acidification potential	mol H^+e	2,36E-02	4,31E-03	6,95E-02	9,75E-02	5,51E-02	1,55E-02	MND	MND	MND	MND	MND	MND	MND	MNR	8,27E-04	1,59E-03	0,00E+00	-7,17E-02
EP-freshwater[2)]	kg Pe	0,00E+00	0,00E+00	3,51E-04	3,51E-04	8,39E-06	3,60E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	-6,31E-06
EP-marine	kg Ne	7,67E-03	1,23E-03	1,04E-02	1,93E-02	1,38E-02	3,40E-03	MND	MND	MND	MND	MND	MND	MND	MNR	2,38E-04	7,53E-04	0,00E+00	-8,44E-03
EP-terrestrial	mol Ne	8,10E-02	1,36E-02	1,15E-01	2,09E-01	1,53E-01	3,72E-02	MND	MND	MND	MND	MND	MND	MND	MNR	2,63E-03	8,01E-03	0,00E+00	-9,90E-02
POCP ("smog")[3)]	kg NMVOCe	5,49E-02	4,00E-03	3,13E-02	9,02E-02	4,05E-02	1,33E-02	MND	MND	MND	MND	MND	MND	MND	MNR	8,08E-04	1,97E-03	0,00E+00	-2,75E-02
ADP-minerals & metals[4)]	kg Sbe	2,83E+02	2,80E-06	4,19E-06	2,83E+02	2,48E-05	2,83E+01	MND	MND	MND	MND	MND	MND	MND	MNR	9,65E-07	4,07E-07	0,00E+00	-2,19E-05
ADP-fossil resources	MJ	3,10E+00	1,20E+01	5,27E+00	2,03E+01	3,71E+01	6,05E+00	MND	MND	MND	MND	MND	MND	MND	MNR	3,05E+00	1,27E+00	0,00E+00	-1,19E+02
Water use[5)]	m^3e depr.	-5,52E-02	5,46E-02	5,15E+00	5,15E+00	1,18E-01	5,93E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,59E-02	6,48E-01	0,00E+00	-1,48E+00

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

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

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	3,91E-08	6,81E-08	1,54E-07	2,61E-07	1,39E-07	4,30E-08	MND	MND	MND	MND	MND	MND	MND	MNR	1,55E-08	1,70E-08	0,00E+00	-6,78E-07
Ionizing radiation[6)]	kBq U235e	3,75E-02	6,24E-02	1,99E+00	2,09E+00	1,71E-01	2,27E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,65E-02	2,76E-03	0,00E+00	-2,35E+00
Ecotoxicity (freshwater)	CTUe	3,37E+01	9,85E+00	9,19E+01	1,35E+02	2,64E+01	1,67E+01	MND	MND	MND	MND	MND	MND	MND	MNR	2,64E+00	2,35E+00	0,00E+00	-2,23E+02
Human toxicity, cancer	CTUh	5,76E-09	3,18E-10	1,46E-09	7,54E-09	1,32E-09	9,44E-10	MND	MND	MND	MND	MND	MND	MND	MNR	9,25E-11	4,21E-10	0,00E+00	-3,36E-09
Human tox. non-cancer	CTUh	5,73E-08	9,89E-09	4,73E-08	1,15E-07	2,41E-08	1,61E-08	MND	MND	MND	MND	MND	MND	MND	MNR	2,59E-09	2,03E-08	0,00E+00	-9,66E-08
SQP[7)]	-	5,13E+02	8,13E+00	2,78E+01	5,49E+02	1,50E+01	5,66E+01	MND	MND	MND	MND	MND	MND	MND	MNR	1,83E+00	4,10E-01	0,00E+00	-9,04E+01

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

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	8,90E+01	1,68E-01	1,31E+01	1,02E+02	3,83E-01	1,03E+01	MND	MND	MND	MND	MND	MND	MND	MNR	5,24E-02	3,10E-02	0,00E+00	-2,63E+01
Renew. PER as material	MJ	2,09E+02	0,00E+00	-2,31E+01	1,85E+02	0,00E+00	-1,70E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	-1,84E+02	0,00E+00	-9,20E-01
Total use of renew. PER	MJ	2,97E+02	1,68E-01	-1,01E+01	2,88E+02	3,83E-01	8,57E+00	MND	MND	MND	MND	MND	MND	MND	MNR	5,24E-02	-1,84E+02	0,00E+00	-2,72E+01
Non-re. PER as energy	MJ	2,88E+02	1,20E+01	1,39E+02	4,39E+02	3,71E+01	4,79E+01	MND	MND	MND	MND	MND	MND	MND	MNR	3,05E+00	1,27E+00	0,00E+00	-1,18E+02
Non-re. PER as material	MJ	1,03E+01	0,00E+00	-3,37E-01	9,97E+00	0,00E+00	-9,10E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	-9,06E+00	0,00E+00	8,42E-01
Total use of non-re. PER	MJ	2,98E+02	1,20E+01	1,39E+02	4,49E+02	3,71E+01	4,70E+01	MND	MND	MND	MND	MND	MND	MND	MNR	3,05E+00	-7,79E+00	0,00E+00	-1,17E+02
Secondary materials	kg	4,38E-03	4,07E-03	1,18E-01	1,26E-01	7,36E-03	1,39E-02	MND	MND	MND	MND	MND	MND	MND	MNR	1,25E-03	3,05E-03	0,00E+00	2,83E-02
Renew. secondary fuels	MJ	1,89E-05	4,31E-05	6,44E-02	6,45E-02	4,40E-05	6,46E-03	MND	MND	MND	MND	MND	MND	MND	MNR	1,45E-05	7,17E-06	0,00E+00	-4,48E-02
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,24E-02	1,48E-03	6,90E-02	1,03E-01	4,15E-03	1,06E-02	MND	MND	MND	MND	MND	MND	MND	MNR	4,28E-04	-2,05E-03	0,00E+00	-9,37E-02

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	5,52E-02	1,35E-02	3,37E-01	4,06E-01	4,35E-02	4,57E-02	MND	MND	MND	MND	MND	MND	MND	MNR	3,97E-03	0,00E+00	0,00E+00	-7,19E-01
Non-hazardous waste	kg	1,29E+00	2,35E-01	1,45E+01	1,60E+01	1,04E+00	2,69E+00	MND	MND	MND	MND	MND	MND	MND	MNR	7,18E-02	9,70E+00	0,00E+00	-2,90E+01
Radioactive waste	kg	8,89E-03	8,26E-05	8,24E-04	9,80E-03	2,59E-04	1,01E-03	MND	MND	MND	MND	MND	MND	MND	MNR	2,08E-05	0,00E+00	0,00E+00	-6,67E-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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	3,51E-02	3,51E-02	0,00E+00	9,18E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	3,06E+00	3,06E+00	0,00E+00	1,29E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	9,70E+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	1,23E+01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,21E+02	0,00E+00	0,00E+00

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

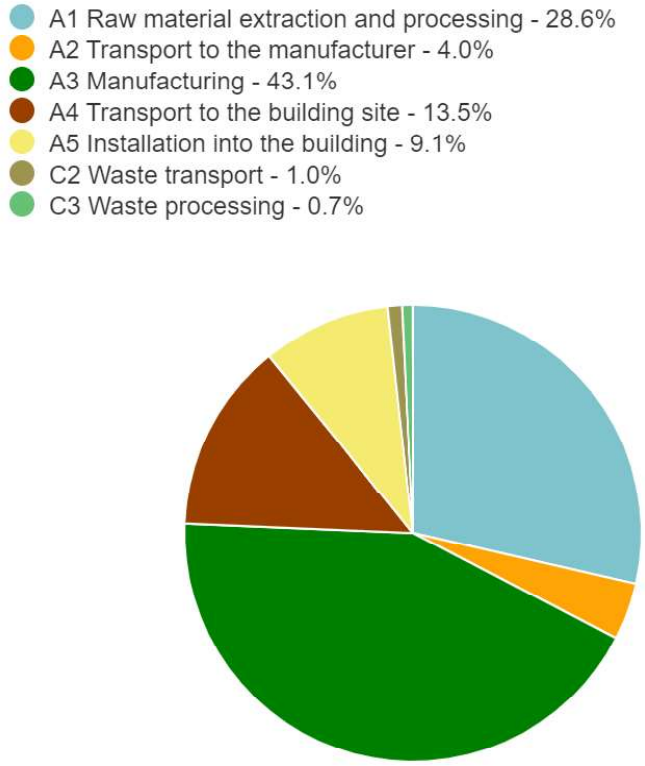
I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
21.06.2024

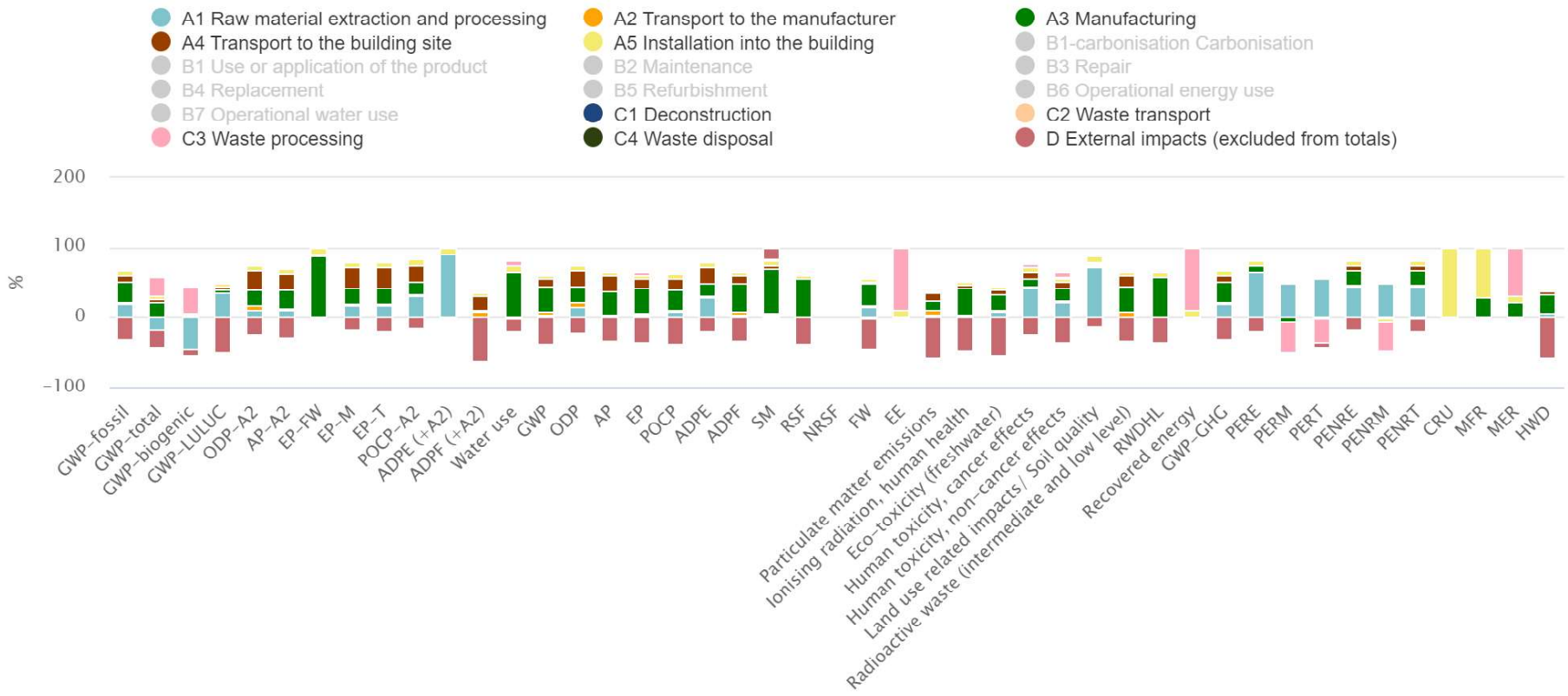
VERIFIED ISO 14025

ANNEX 1: LIFE-CYCLE ASSESSMENT RESULT VISUALIZATION

GLOBAL WARMING POTENTIAL FOSSIL KG CO2E – LIFE CYCLE STAGES



LIFECYCLE IMPACTS BY STAGE AS STACKED COLUMNS



SANKEY DIAGRAM, GLOBAL WARMING POTENTIAL FOSSIL