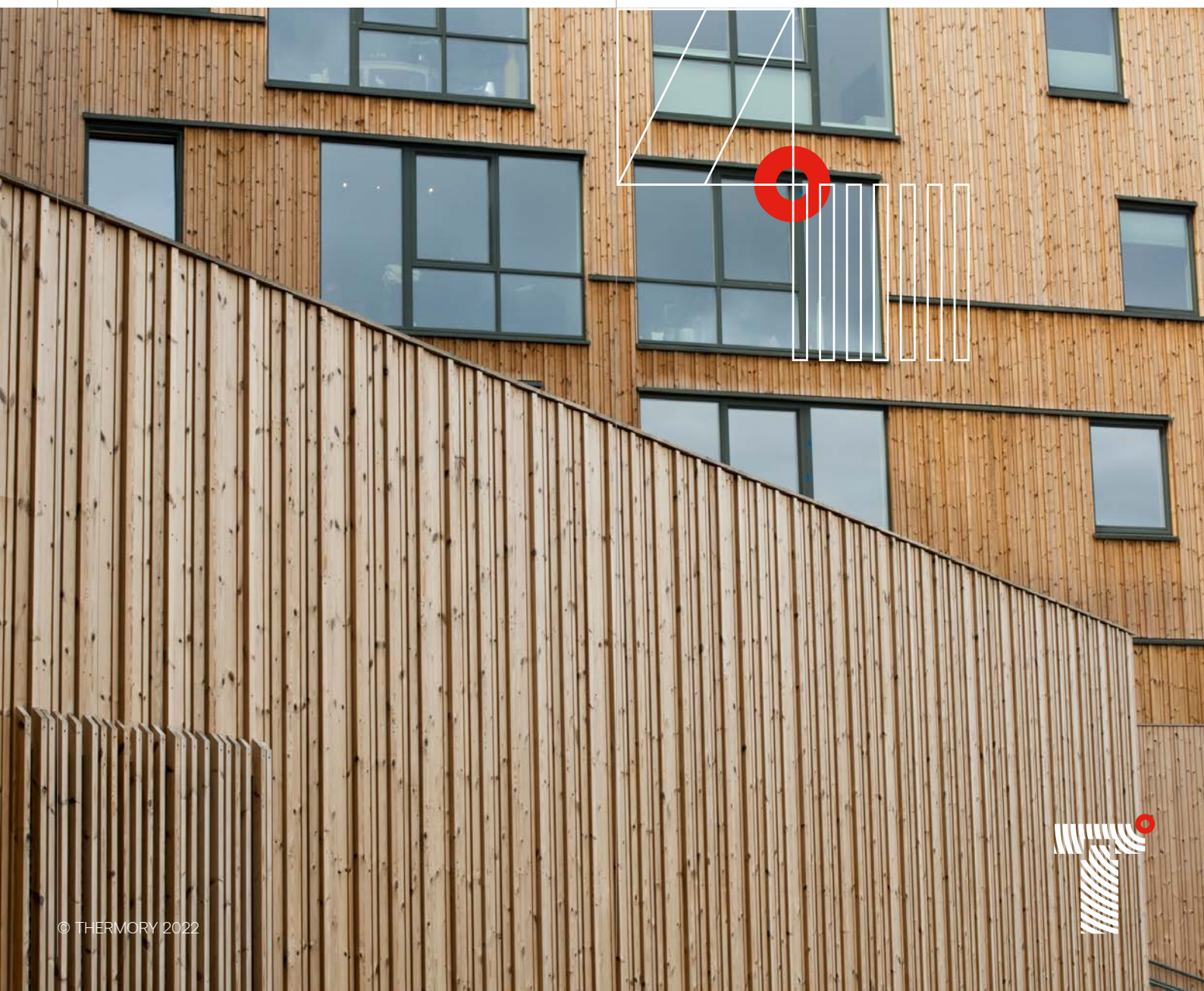
THERMORY®

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804+A2 & ISO 14025 / ISO 21930

Thermally modified solid hardwood and softwood boards with or without surface coating



General Information

MANUFACTURER INFORMATION

MANUFACTURER	Thermory AS
ADDRESS	Lõõtsa 1A, 11415 Tallinn
CONTACT DETAILS	info@thermory.com
WEBSITE	www.thermory.com

PRODUCT IDENTIFICATION

PRODUCT NAME	Thermally modified solid hardwood and softwood boards with or without surface coating
PLACE(S) OF PRODUCTION	Estonia (2 locations)

The building information Foundation RTS sr

EPDs within the same product category but from different programmes may not be comparable.

Jukka Soppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD PROGRAM OPERATOR	The Building Information Foundation RTS sr
EPD STANDARDS	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
PRODUCT CATEGORY RULES	The CEN standard EN 15804 serves as the core PCR. In addition. the RTS PCR (English version, 26.8.2020) is used.
EPD AUTHOR	Mari Kirss Rangi Maja OÜ www.lcasupport.com
EPD VERIFICATION	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
VERIFICATION DATE	28 November 2022
EPD VERIFIER	Sigita Židonienė Vesta Consulting UAB www.vestaconsulting.lt
EPD NUMBER	RTS_192_22
PUBLISHING DATE	5 December 2022
EPD VALID UNTIL	5 December 2027

Product Information

PRODUCT DESCRIPTION

Thermory timber boards with thermal modification treatment. No chemicals are used in the process or added to the products during thermal modification treatment. Dark colour and biological durability are achieved through prolonged presence of the products to elevated temperatures.

Product 1 - thermally modified hardwood without surface coating

Product 2 - thermally modified softwood without surface coating

Product 3 - thermally modified hardwood with surface coating

Product 4 - thermally modified softwood with surface coating

PRODUCT APPLICATION

Boards treated thermally in order to achieve extended biological durability can be used indoors as well as outdoors in contact to weather elements such as rain and sunshine. Decking and cladding are most common applications.

Surface painting can be applied to cladding and oiling to decking or cladding as options.

TECHNICAL SPECIFICATIONS

Thermally modified solid timber from various species. Heartwood, sapwood and knots may be present in the final board. Board colour has homogenously turned darker and durability against biological attack has risen.

PRODUCT STANDARDS

EN 14915:2013 + A2:2020

PHYSICAL PROPERTIES OF THE PRODUCT

Product measurements vary: thickness 7-42 mm, width 18-210 mm, length 0.2-6 m, density 420-650 kg/m^3. Moisture content 4–6%.

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at **www.thermory.com**.

PRODUCT RAW MATERIAL MAIN COMPOSITION

RAW MATERIAL CATEGORY	AMOUNT, MASS-%	MATERIAL ORIGIN
METALS	0	
MINERALS	<1	EU
FOSSIL MATERIALS	<1	EU
BIO-BASED MATERIALS	<99	Global

Hardwood boards are mostly made from non-certified materials (7–11% certified) and softwood boards are mostly made from FSC-certified materials (95% certified).

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

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 EPD covers two manufacturing locations in Estonia. Thermally modified hardwood boards and softwood boards without surface coating are produced in both locations. Thermally modified hardwood boards and softwood boards with sur-face coating are produced in only one of the locations.

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.

On average, the final product is transported 1600 km by a lorry.

Installation impacts include provision of all materials, products and energy, as well as waste processing up to end-of-waste state or disposal of final residues during the construction process stage. Fasteners have been excluded as cut-off has been applied. In addition, most of our products can be ordered with matched tongue-andgroove ends. Matched tongue-and-groove ends allow boards of different lengths to be installed without the need to rest them on joists.

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)

At the end-of-life, in the demolition phase, 70% of the waste is assumed to be collected as separate wood waste and 30% as mixed construction waste (C1), 97% of the sorted end-of-life product is assumed to be sent to the closest facilities (C2) and 3% of the sorted end-of-life product and 100% of the mixed construction waste is landfilled or incinerated without energy recovery (C4). EOL scenarios have been based on EU data.

Manufacturing Process

The manufacturing process starts with the arrival of the raw materials. After thermal treatment, the timber is cut to size, moulded into profile and the defects are cut off. The final product is packaged and labelled. The surface of the boards can optionally be painted or oiled. Some of the wood waste generated during the manufacturing process is used to power the wood drying kilns, generate heat or is repurposed as packaging material.

Life-Cycle Assessment

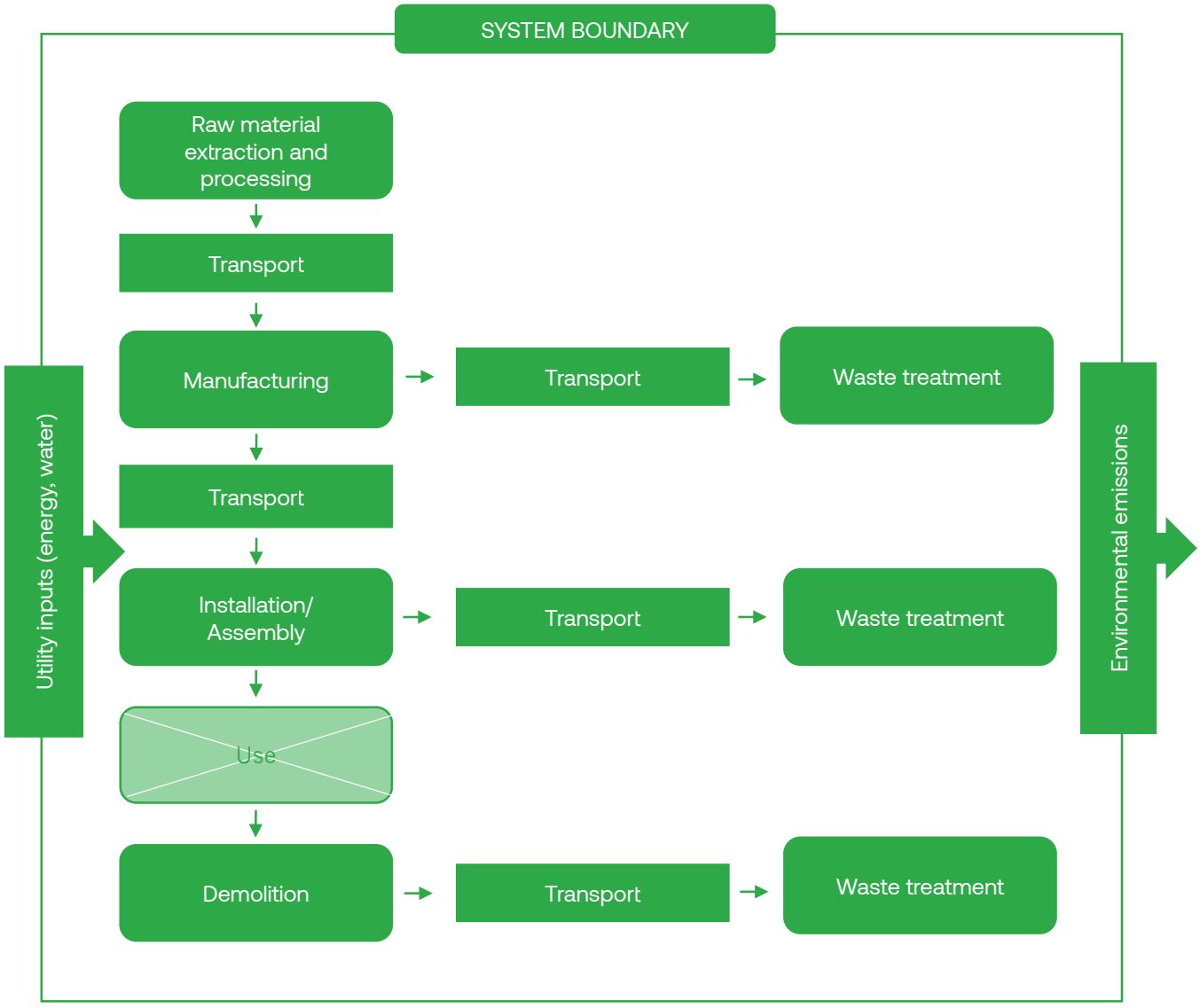
LIFE-CYCLE ASSESSMENT INFORMATION

PERIOD FOR DATA	2021
DECLARED UNIT	1 m^3
AVERAGE MASS PER DECLARED UNIT	
PRODUCT 1	562 kg
PRODUCT 2	473 kg
PRODUCT 3	648 kg
PRODUCT 4	484 kg

BIOGENIC CARBON CONTENT AT FACTORY GATE

BIOGENIC CARBON CONTENT IN PRODUCT	
PRODUCT 1	268 kg C
PRODUCT 2	225 kg C
PRODUCT 3	301 kg C
PRODUCT 4	221 kg C
BIOGENIC CARBON CONTENT IN PACKAGING	
PRODUCT 1	3 kg C
PRODUCT 2	2 kg C
PRODUCT 3	2 kg C
PRODUCT 4	2 kg C

SYSTEM BOUNDARY



This EPD covers cradle to gate with options, modules C1–C4 and module D scope with the following modules; A1 (Raw material supply). A2 (Transport) and A3 (Manufacturing). A4 (Transport). A5 (Assembly) as well as C1 (Deconstruction). C2 (Transport at end-of-life). C3 (Waste processing) and C4 (Disposal). In addition. module D - benefits and loads beyond the system boundary is included.

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	D	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	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.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 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.

Cut off has only been applied in A5 to exclude fasteners.

ALLOCATION

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.

2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.

3. Allocation should be based on economic values.

Module A1 includes allocation for co-products. Allocation has been done based on economic values as the revenue of Products and co-products differs greatly.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification', This methodology is in line with the requirements of EN 15804.

ESTIMATES AND ASSUMPTIONS

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

• Module A2, A4 & C2 Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation company to serve the needs of other clients.

• Module A3 Waste wood used for powering the wood drying kilns and heating system was allocated based on share of wet wood used. All other energy use and waste generated was allocated based on production volume.

• Module A4 The transportation distance is defined according to RTS PCR. The typical installation place was assumed as an average option – 1600 km by lorry. According to the manufacturer, transportation doesn't cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products.

• Module A5 No fuels or energy is needed for installation.

• Module C1 Consumption of energy and natural resources in demolition process are assumed to be negligible. It is assumed that 100% of the waste is collected.

• Module C2 It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed to have the same weight with the declared product. All of the end-of-life product is assumed to be collected as sorted wood waste or mixed construction waste and sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 250 km and the transportation method is assumed as lorry which is the most common option.

• Module C3 97% of the sorted wood waste is incinerated for energy recovery or recycled, in the ratio of 0.4749 to incineration and 0.4947 to recycling. Losses in the sorting process are assumed to be very small and not considered in the assessment.

• Module C4 The remaining 3% of the sorted wood waste and 100% of the mixed construction waste are assumed to be sent to landfill or incinerated without energy recovery, in the ratio of 0.3356 to landfilling and 0.6644 to incineration.

• Module D Benefits of recyclable waste generated in the Module C3 are considered. It was assumed that the sorted wood waste is incinerated or recycled - for example, used for fibrewood production - in the same ratio as in module C3.

AVERAGES AND VARIABILITY

All Products are averaged Products, Product 1 and Product 2 are produced in two locations, Product 3 and Product 4 are produced in only one location. The production processes are similar in both locations.

BIOGENIC CARBON AND GWP-BIOGENIC

Biogenic carbon content in Product and packaging has been calculated according to EN 16449. Irrespective of the chosen allocation for co-products, biogenic carbon content reflects physical flows.

In the ecoinvent database, datasets with multiple products are allocated in the attributional system models, most frequently using price. When products have large difference in value, this leads to an allocation of most of the impacts to the more valuable product and can lead to a discrepancy between the biogenic carbon content of a product and the amount allocated to it based on the life cycle inventory (Ruiz et al. 2021). Therefore, GWP-biogenic values have been recalculated based on EN 16449 and EN 16485:2014. Carbon sequestration and carbon neutrality has only been assumed for sustainable wood (FSC-certified).

Environmental Impact Data

Note: additional environmental impact data are presented in annexes.

THERMALLY MODIFIED HARDWOOD WITHOUT SURFACE COATING

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	4.64E1	7.32E2	7.79E2	8.21E1	1.13E1	0E0	7.22E1	9.85E2	6.29E1	4.47E2
GWP – FOSSIL	kg CO_2e	1.52E2	1.83E2	3.35E2	8.28E1	1.88E0	0E0	7.21E1	3.34E0	6.29E1	-1.08E2
GWP – BIOGENIC	kg CO_2e	-1.07E2	5.08E1	-5.66E1	6.02E-2	3.36E-1	0E0	3.29E-2	6.94E1	3.73E-3	-3.57E2
GWP – LULUC	kg CO_2e	1.96E0	4.98E2	5E2	2.49E-2	9.04E0	0E0	4.04E-2	9.12E2	1.61E-3	9.12E2
OZONE DEPLETION POT.	kg CFC-$_{11}$e	2.48E-5	1.5E-5	3.99E-5	1.95E-5	1.44E-7	0E0	1.54E-5	2.79E-7	6.27E-7	-1.65E-5
ACIDIFICATION POTENTIAL	mol H+e	1.07E0	5.85E-1	1.65E0	3.48E-1	3.95E-3	0E0	2.84E-1	1.84E-2	4.33E-2	-1.44E-1
EP-FRESHWATER	kg Pe	1.68E-2	3.15E-2	4.82E-2	6.74E-4	9.3E-6	0E0	8.5E-4	3.49E-4	8.74E-5	-2.21E-3
EP-MARINE	kg Ne	3.58E-1	7.57E-1	1.11E0	1.05E-1	1.36E-3	0E0	7.61E-2	2.48E-3	1.82E-2	-4.4E-2
EP-TERRESTRIAL	mol Ne	3.9E0	1.83E0	5.73E0	1.16E0	1.47E-2	0E0	8.45E-1	3.02E-2	1.89E-1	-4.76E-1
POCP (“SMOG”)	kg NMVOCe	1.49E0	3.87E-1	1.88E0	3.72E-1	4.09E-3	0E0	2.64E-1	7.87E-3	4.79E-2	-2.26E-1
ADP-MINERALS & METALS	kg Sbe	3.16E-3	8.81E-4	4.04E-3	1.41E-3	3.56E-6	0E0	3.55E-3	1.29E-5	8.28E-5	-3.46E-4
ADP-FOSSIL RESOURCES	MJ	2.13E3	2.16E3	4.28E3	1.29E3	1.86E0	0E0	1.07E3	6.75E1	5.08E1	-1.79E3
WATER USE	m^3e depr.	2.45E1	1.64E4	1.64E4	4.79E0	6.75E-2	0E0	4.43E0	8.43E-1	5.29E0	-1.89E1

1 GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential.
2 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 experienced with the indicator.

USE OF NATURAL RESOURCES

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
RENEW. PER AS ENERGY	MJ	1.08E4	9.99E2	1.18E4	1.62E1	3.91E-2	0E0	2.29E1	1.14E1	1.42E0	-2.18E3
RENEW. PER AS MATERIAL	MJ	1.04E4	-2.86E3	7.56E4	0E0	-3.41E1	0E0	0E0	-5.11E3	-2.42E3	-5.11E3
TOTAL USE OF RENEW. PER	MJ	1.08E4	9.99E2	1.18E4	1.62E1	3.91E-2	0E0	2.29E1	-5.09E3	-2.42E3	-7.29E3
NON-RE. PER AS ENERGY	MJ	2.13E3	2.05E3	4.17E3	1.29E3	1.86E0	0E0	1.07E3	6.75E1	5.08E1	-1.79E3
NON-RE. PER AS MATERIAL	MJ	0E0	1.11E2	1.11E2	0E0	-1.11E2	0E0	0E0	0E0	0E0	0E0
TOTAL USE OF NON-RE. PER	MJ	2.13E3	2.16E3	4.28E3	1.29E3	-1.09E2	0E0	1.07E3	6.75E1	5.08E1	-1.79E3
SECONDARY MATERIALS	kg	0E0	2.61E0	2.61E0	0E0	0E0	0E0	0E0	0E0	0E0	1.95E2
RENEW. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.5E3
NON-REN. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
USE OF NET FRESH WATER	m^3	1.05E0	1.05E0	2.10E0	2.68E-1	3.91E-3	0E0	1.95E-1	2.11E-2	2.09E-1	-4.33E-1

PER = Primary energy resources

END OF LIFE – WASTE

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HAZARDOUS WASTE	kg	6.71E0	3.15E0	9.86E0	1.25E0	8.52E-2	0E0	1.53E0	0E0	4.37E0	8.28E-2
NON-HAZARDOUS WASTE	kg	2.24E2	8.06E1	3.05E2	1.39E2	2.32E0	0E0	6.69E1	0E0	1.76E2	1.67E2
RADIOACTIVE WASTE	kg	1.2E-2	2.3E-3	1.43E-2	8.85E-3	1.03E-5	0E0	7.1E-3	0E0	2.09E-4	-1.91E-3

END OF LIFE – OUTPUT FLOWS

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
COMPONENTS FOR RE-USE	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
MATERIALS FOR RECYCLING	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.95E2	0E0	0E0
MATERIALS FOR ENERGY REC	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.87E2	0E0	0E0
EXPORTED ENERGY	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.5E3	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	8.22E-2	1.3E0	1.38E0	1.47E-1	1.99E-2	0E0	1.28E-1	1.74E0	1.11E-1	7.91E-1
ADP-MINERALS & METALS	kg Sbe	5.58E-6	1.61E-6	7.2E-6	2.5E-6	5.37E-8	0E0	6.28E-6	2.29E-8	1.47E-7	-6.13E-7
ADP-FOSSIL	MJ	3.77E0	3.84E0	7.61E0	2.28E0	1.82E-2	0E0	1.89E0	1.19E-1	8.99E-2	-3.17E0
WATER USE	m^3e depr.	4.34E-2	2.91E1	2.91E1	8.48E-3	1.19E-4	0E0	7.83E-3	1.49E-3	9.36E-3	-3.35E-2
SECONDARY MATERIALS	kg	0E0	4.62E-3	4.62E-3	0E0	0E0	0E0	0E0	0E0	0E0	1.95E2
BIOG. C IN PRODUCT	kg C	N/A	4.76E-1	4.76E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIOG. C IN PACKAGING	kg C	N/A	4.55E-3	4.55E-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

THERMALLY MODIFIED SOFTWOOD WITHOUT SURFACE COATING

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	-1.05E3	5.83E2	-4.62E2	6.92E1	9.44E0	0E0	6.08E1	8.29E2	5.29E1	-3.49E2
GWP – FOSSIL	kg CO_2e	1.28E2	1.7E2	2.98E2	6.98E1	1.49E0	0E0	6.07E1	2.81E0	5.29E1	-9.08E1
GWP – BIOGENIC	kg CO_2e	-1.17E3	3.91E2	-7.83E2	5.07E-2	7.15E0	0E0	2.77E-2	7.84E2	5.72E-3	-3.01E2
GWP – LULUC	kg CO_2e	8.13E-1	2.21E1	2.29E1	2.1E-2	8E-1	0E0	3.4E-2	4.29E1	1.35E-3	4.28E1
OZONE DEPLETION POT.	kg $CFC\text{-}_{11}e$	1.87E-5	2.07E-5	3.94E-5	1.64E-5	6.38E-8	0E0	1.3E-5	2.35E-7	5.27E-7	-1.37E-5
ACIDIFICATION POTENTIAL	mol H+e	9.18E-1	3.54E-1	1.27E0	2.93E-1	2.35E-3	0E0	2.39E-1	1.55E-2	3.65E-2	-1.3E-1
EP-FRESHWATER	kg Pe	8.8E-3	5.18E-3	1.4E-2	5.68E-4	4.17E-6	0E0	7.16E-4	2.93E-4	7.35E-5	-9.71E-4
EP-MARINE	kg Ne	2.99E-1	1.5E-1	4.49E-1	8.83E-2	9.22E-4	0E0	6.41E-2	2.09E-3	1.53E-2	-3.98E-2
EP-TERRESTRIAL	mol Ne	3.3E0	1.24E0	4.55E0	9.76E-1	9.82E-3	0E0	7.11E-1	2.55E-2	1.59E-1	-4.39E-1
POCP (“SMOG”)	kg NMVOCe	1.01E0	2.91E-1	1.3E0	3.14E-1	2.6E-3	0E0	2.22E-1	6.63E-3	4.04E-2	-1.56E-1
ADP-MINERALS & METALS	kg Sbe	2.28E-3	4.78E-4	2.75E-3	1.19E-3	3.56E-6	0E0	2.99E-3	1.09E-5	6.97E-5	-2.6E-4
ADP-FOSSIL RESOURCES	MJ	1.75E3	2.52E3	4.27E3	1.09E3	1.86E0	0E0	8.98E2	5.68E1	4.27E1	-1.5E3
WATER USE	m^3e depr.	1.79E1	1.41E4	1.41E4	4.04E0	5.11E-2	0E0	3.73E0	7.1E-1	4.45E0	-1.52E1

1 GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential.
2 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 experienced with the indicator.

USE OF NATURAL RESOURCES

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
RENEW. PER AS ENERGY	MJ	6.19E3	1.05E3	7.24E3	1.37E1	3.91E-2	0E0	1.93E1	9.56E0	1.19E0	-1.08E3
RENEW. PER AS MATERIAL	MJ	9.41E3	-3.08E3	6.34E3	0E0	-3.01E0	0E0	0E0	-4.3E3	-2.03E3	-4.3E3
TOTAL USE OF RENEW. PER	MJ	1.546E4	-2.03E3	1.36E4	1.37E1	-2.97E0	0E0	1.93E1	-4.29E3	-2.03E3	-5.38E3
NON-RE. PER AS ENERGY	MJ	1.75E3	2.41E3	4.16E3	1.09E3	1.86E0	0E0	8.98E2	5.68E1	4.27E1	-1.5E3
NON-RE. PER AS MATERIAL	MJ	0E0	1.11E2	1.11E2	0E0	-1.11E2	0E0	0E0	0E0	0E0	0E0
TOTAL USE OF NON-RE. PER	MJ	1.75E3	2.52E3	4.27E3	1.09E3	-1.09E2	0E0	8.98E2	5.68E1	4.27E1	-1.5E3
SECONDARY MATERIALS	kg	0E0	4.15E0	4.15E0	0E0	0E0	0E0	0E0	0E0	0E0	1.64E2
RENEW. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.11E3
NON-REN. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
USE OF NET FRESH WATER	m^3	5.21E-1	5.70E1	1.09E0	2.26E-1	3.91E-3	0E0	1.64E-1	1.78E-2	1.76E-1	-2.99E-1

PER = Primary energy resources

END OF LIFE – WASTE

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HAZARDOUS WASTE	kg	6.6E0	2.33E0	8.93E0	1.06E0	8.52E-2	0E0	1.29E0	0E0	3.68E0	-1.48E-2
NON-HAZARDOUS WASTE	kg	1.9E2	6.54E1	2.55E2	1.17E2	2.32E0	0E0	5.63E1	0E0	1.48E2	1.42E2
RADIOACTIVE WASTE	kg	9.2E-3	2.13E-3	1.13E-2	7.45E-3	1.03E-5	0E0	5.98E-3	0E0	1.76E-4	-1.51E-3

END OF LIFE – OUTPUT FLOWS

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
COMPONENTS FOR RE-USE	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
MATERIALS FOR RECYCLING	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.64E2	0E0	0E0
MATERIALS FOR ENERGY REC	kg	0E0	2.42E1	2.42E1	0E0	0E0	0E0	0E0	1.57E2	0E0	0E0
EXPORTED ENERGY	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.11E3	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	-2.21E0	1.23E0	-9.77E-1	1.48E-1	2E-2	0E0	1.28E-1	1.75E0	1.12E-1	-7.37E-1
ADP-MINERALS & METALS	kg Sbe	4.81E-6	1.01E-6	5.82E-6	2.52E-6	1.76E-8	0E0	6.32E-6	2.3E-8	1.47E-7	-5.49E-7
ADP-FOSSIL	MJ	3.7E0	5.33E0	9.03E0	2.3E0	9.71E-3	0E0	1.9E0	1.2E-1	9.04E-2	-3.17E0
WATER USE	m^3e depr.	3.78E-2	2.97E1	2.98E1	8.54E-3	1.08E-4	0E0	7.88E-3	1.5E-3	9.41E-3	-3.21E-2
SECONDARY MATERIALS	kg	0E0	8.78E-3	8.78E-3	0E0	0E0	0E0	0E0	0E0	0E0	1.64E2
BIOG. C IN PRODUCT	kg C	N/A	4.76E-1	4.76E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIOG. C IN PACKAGING	kg C	N/A	4.58E-3	4.58E-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

THERMALLY MODIFIED HARDWOOD WITH SURFACE COATING

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	-1.67E1	8.14E2	7.98E2	9.44E1	9.28E0	0E0	8.32E1	1.11E3	7.25E1	4.39E2
GWP – FOSSIL	kg CO_2e	1.79E2	1.94E2	3.73E2	9.52E1	1.45E0	0E0	8.31E1	3.85E0	7.25E1	-1.24E2
GWP – BIOGENIC	kg CO_2e	-2.03E2	7.92E1	-1.24E2	6.91E-2	9.17E-1	0E0	3.79E-2	1.28E2	3.11E-3	-4.12E2
GWP – LULUC	kg CO_2e	7.22E0	5.41E2	5.49E2	2.87E-2	6.91E0	0E0	4.66E-2	9.75E2	1.85E-3	9.75E2
OZONE DEPLETION POT.	kg $CFC-_{11}e$	2.72E-5	2.17E-5	4.89E-5	2.24E-5	5.54E-8	0E0	1.78E-5	3.22E-7	7.22E-7	-1.9E-5
ACIDIFICATION POTENTIAL	mol H+e	1.43E0	3.92E-1	1.82E0	4E-1	2.19E-3	0E0	3.27E-1	2.12E-2	5E-2	-1.64E-1
EP-FRESHWATER	kg Pe	2.07E-2	3.22E-3	2.39E-2	7.74E-4	3.83E-6	0E0	9.8E-4	4.02E-4	1.01E-4	-2.49E-3
EP-MARINE	kg Ne	4.42E-1	1.03E-1	5.45E-1	1.2E-1	8.72E-4	0E0	8.77E-2	2.86E-3	2.1E-2	-5E-2
EP-TERRESTRIAL	mol Ne	4.68E0	1.32E0	5.99E0	1.33E0	9.27E-3	0E0	9.74E-1	3.49E-2	2.18E-1	-5.41E-1
POCP (“SMOG”)	kg NMVOCe	1.74E0	3.27E-1	2.07E0	4.28E-1	2.45E-3	0E0	3.04E-1	9.07E-3	5.53E-2	-2.56E-1
ADP-MINERALS & METALS	kg Sbe	3.57E-3	4.68E-4	4.04E-3	1.62E-3	2.19E-6	0E0	4.09E-3	1.49E-5	9.54E-5	-3.9E-4
ADP-FOSSIL RESOURCES	MJ	2.5E3	2.61E3	5.11E3	1.48E3	1.35E0	0E0	1.23E3	7.78E1	5.85E1	-2.06E3
WATER USE	m^3e depr.	3.85E1	2.02E4	2.03E4	5.51E0	5.05E-2	0E0	5.1E0	9.72E-1	6.1E0	-2.17E1

1 GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential.
2 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 experienced with the indicator.

USE OF NATURAL RESOURCES

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
RENEW. PER AS ENERGY	MJ	1.22E4	1.16E3	1.34E4	1.86E1	3.09E-2	0E0	2.64E1	1.31E1	1.64E0	-2.46E3
RENEW. PER AS MATERIAL	MJ	1.26E4	-4E3	8.56E3	0E0	0E0	0E0	0E0	-5.81E3	-2.75E3	-5.81E3
TOTAL USE OF RENEW. PER	MJ	2.48E4	-2.84E3	2.19E4	1.86E1	3.09E-2	0E0	2.64E1	-5.8E3	-2.75E3	-8.28E3
NON-RE. PER AS ENERGY	MJ	2.5E3	2.5E3	5E3	1.48E3	1.35E0	0E0	1.23E3	7.78E1	5.85E1	-2.06E3
NON-RE. PER AS MATERIAL	MJ	0E0	1.11E2	1.11E2	0E0	-1.11E2	0E0	0E0	0E0	0E0	0E0
TOTAL USE OF NON-RE. PER	MJ	2.5E3	2.61E3	5.11E3	1.48E3	-1.1E2	0E0	1.23E3	7.78E1	5.85E1	-2.06E3
SECONDARY MATERIALS	kg	3.56E-1	4.3E0	4.66E0	0E0	0E0	0E0	0E0	0E0	0E0	2.24E2
RENEW. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.88E3
NON-REN. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
USE OF NET FRESH WATER	m^3	1.4E0	6.91E-1	2.09E00	3.08E-1	3.85E-3	0E0	2.25E-1	2.44E-2	2.41E-1	-4.96E-1

PER = Primary energy resources

END OF LIFE – WASTE

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HAZARDOUS WASTE	kg	1.04E1	2.93E0	1.33E1	1.44E0	8.47E-2	0E0	1.76E0	0E0	5.04E0	1.15E-1
NON-HAZARDOUS WASTE	kg	2.81E2	4.32E1	3.25E2	1.59E2	2.31E0	0E0	7.71E1	0E0	2.03E2	1.93E2
RADIOACTIVE WASTE	kg	1.32E-2	2.21E-3	1.54E-2	1.02E-2	6.79E-6	0E0	8.19E-3	0E0	2.41E-4	-2.17E-3

END OF LIFE – OUTPUT FLOWS

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
COMPONENTS FOR RE-USE	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
MATERIALS FOR RECYCLING	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.24E2	0E0	0E0
MATERIALS FOR ENERGY REC	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.15E2	0E0	0E0
EXPORTED ENERGY	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.88E3	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	-2.54E-2	1.24E0	1.22E0	1.45E-1	1.42E-2	0E0	1.27E-1	1.69E0	1.11E-1	6.7E-1
ADP-MINERALS & METALS	kg Sbe	5.45E-6	7.59E-7	6.21E-6	2.48E-6	1.04E-8	0E0	6.25E-6	2.28E-8	1.46E-7	-5.95E-7
ADP-FOSSIL	MJ	3.82E0	4.01E0	7.82E0	2.26E0	6.15E-3	0E0	1.88E0	1.19E-1	8.94E-2	-3.14E0
WATER USE	m^3e depr.	5.88E-2	3.09E1	3.1E1	8.41E-3	7.71E-5	0E0	7.79E-3	1.48E-3	9.31E-3	-3.31E-2
SECONDARY MATERIALS	kg	5.44E-4	6.57E-3	7.11E-3	0E0	0E0	0E0	0E0	0E0	0E0	2.24E2
BIOG. C IN PRODUCT	kg C	N/A	4.64E-1	4.64E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIOG. C IN PACKAGING	kg C	N/A	3.29E-3	3.29E-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

THERMALLY MODIFIED SOFTWOOD WITH SURFACE COATING

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	-1.03E3	6.19E2	-4.13E2	7.03E1	9.6E0	0E0	6.18E1	8.15E2	5.39E1	-3.56E2
GWP – FOSSIL	kg CO_2e	1.42E2	1.87E2	3.29E2	7.1E1	1.78E0	0E0	6.18E1	2.86E0	5.38E1	-9.22E1
GWP – BIOGENIC	kg CO_2e	-1.18E3	4.08E2	-7.71E2	5.15E-2	7.41E0	0E0	2.82E-2	7.7E2	6.23E-3	-3.06E2
GWP – LULUC	kg CO_2e	5.9E0	2.35E1	2.94E1	2.14E-2	4.1E-1	0E0	3.46E-2	4.27E1	1.38E-3	4.26E1
OZONE DEPLETION POT.	kg $CFC-_{11}e$	2.01E-5	2.17E-5	4.18E-5	1.67E-5	1.24E-7	0E0	1.32E-5	2.39E-7	5.37E-7	-1.39E-5
ACIDIFICATION POTENTIAL	mol H+e	1.13E0	4.04E-1	1.53E0	2.98E-1	3.47E-3	0E0	2.43E-1	1.58E-2	3.71E-2	-1.3E-1
EP-FRESHWATER	kg Pe	1.01E-2	3.27E-3	1.34E-2	5.77E-4	8.11E-6	0E0	7.28E-4	2.98E-4	7.48E-5	-9.65E-4
EP-MARINE	kg Ne	3.29E-1	1.02E-1	4.31E-1	8.98E-2	1.2E-3	0E0	6.52E-2	2.12E-3	1.56E-2	-4E-2
EP-TERRESTRIAL	mol Ne	3.48E0	1.37E0	4.84E0	9.92E-1	1.29E-2	0E0	7.23E-1	2.59E-2	1.62E-1	-4.41E-1
POCP (“SMOG”)	kg NMVOCe	1.07E0	3.32E-1	1.4E0	3.19E-1	3.59E-3	0E0	2.26E-1	6.74E-3	4.1E-2	-1.57E-1
ADP-MINERALS & METALS	kg Sbe	2.56E-3	5.21E-4	3.08E-3	1.21E-3	3.56E-6	0E0	3.04E-3	1.11E-5	7.09E-5	-2.59E-4
ADP-FOSSIL RESOURCES	MJ	1.95E3	2.62E3	4.57E3	1.1E3	1.86E0	0E0	9.14E2	5.78E1	4.35E1	-1.52E3
WATER USE	m^3e depr.	2.87E1	1.42E4	1.43E4	4.11E0	7.17E-2	0E0	3.79E0	7.22E-1	4.53E0	-1.54E1

1 GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential.
2 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 experienced with the indicator.

USE OF NATURAL RESOURCES

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
RENEW. PER AS ENERGY	MJ	6.28E3	1.28E3	7.56E3	1.39E1	3.91E-2	0E0	1.96E1	9.72E0	1.22E0	-1.08E3
RENEW. PER AS MATERIAL	MJ	9.44E3	-3.11E3	6.33E3	0E0	0E0	0E0	0E0	-4.3E3	-2.03E3	-4.3E3
TOTAL USE OF RENEW. PER	MJ	1.57E3	-1.82E3	1.39E4	1.39E1	3.91E-2	0E0	1.96E1	-4.29E3	-2.06E3	-5.38E3
NON-RE. PER AS ENERGY	MJ	1.95E3	2.51E3	4.46E3	1.1E3	1.86E0	0E0	9.14E2	5.78E1	4.35E1	-1.52E3
NON-RE. PER AS MATERIAL	MJ	0E0	1.11E2	1.11E2	0E0	-1.11E2	0E0	0E0	0E0	0E0	0E0
TOTAL USE OF NON-RE. PER	MJ	1.95E3	2.62E3	4.57E3	1.1E3	-1.09E2	0E0	9.14E2	5.78E1	4.35E1	-1.52E3
SECONDARY MATERIALS	kg	3.56E-1	4.3E0	4.66E0	0E0	0E0	0E0	0E0	0E0	0E0	1.67E2
RENEW. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.14E3
NON-REN. SECONDARY FUELS	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
USE OF NET FRESH WATER	m^3	7.68E-1	5.69E-1	1.34E00	2.3E-1	3.91E-3	0E0	1.67E-1	1.81E-2	1.79E-1	-3.03E-1

PER = Primary energy resources

END OF LIFE – WASTE

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HAZARDOUS WASTE	kg	9.26E0	3.83E0	1.31E1	1.07E0	8.52E-2	0E0	1.31E0	0E0	3.75E0	-5.38E-4
NON-HAZARDOUS WASTE	kg	2.18E2	6.92E1	2.87E2	1.19E2	2.32E0	0E0	5.73E1	0E0	1.51E2	1.45E2
RADIOACTIVE WASTE	kg	9.77E-3	2.28E-3	1.21E-2	7.58E-3	1.03E-5	0E0	6.08E-3	0E0	1.79E-4	-1.52E-3

END OF LIFE – OUTPUT FLOWS

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
COMPONENTS FOR RE-USE	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
MATERIALS FOR RECYCLING	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	1.67E2	0E0	0E0
MATERIALS FOR ENERGY REC	kg	0E0	2.46E1	2.46E1	0E0	0E0	0E0	0E0	1.6E2	0E0	0E0
EXPORTED ENERGY	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	2.14E3	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – TOTAL	kg CO_2e	-2.18E0	1.31E0	-8.72E-1	1.5E-1	2.03E-2	0E0	1.31E-1	1.72E0	1.14E-1	-7.52E-1
ADP-MINERALS & METALS	kg Sbe	5.41E-6	1.1E-6	6.51E-6	2.56E-6	5.48E-8	0E0	6.43E-6	2.34E-8	1.5E-7	-5.47E-7
ADP-FOSSIL	MJ	4.12E0	5.55E0	9.67E0	2.33E0	1.88E-2	0E0	1.93E0	1.22E-1	9.19E-2	-3.22E0
WATER USE	m^3e depr.	6.07E-2	3.01E1	3.01E1	8.68E-3	1.52E-4	0E0	8.01E-3	1.53E-3	9.57E-3	-3.26E-2
SECONDARY MATERIALS	kg	7.53E-4	9.09E-3	9.85E-3	0E0	0E0	0E0	0E0	0E0	0E0	1.67E2
BIOG. C IN PRODUCT	kg C	N/A	4.60E-1	4.60E-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIOG. C IN PACKAGING	kg C	N/A	4.43E-3	4.43E-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

SCENARIO PARAMETER	VALUE
ELECTRICITY DATA SOURCE AND QUALITY	Modelled electricity based on Estonian renewable energy production mix for 2020-2021
ELECTRICITY CO_2E / KWH	0.04

Transport scenario documentation (A4)

SCENARIO PARAMETER	VALUE
SPECIFIC TRANSPORT CO_2E EMISSIONS. KG CO_2E / TKM	0.0901
AVERAGE TRANSPORT DISTANCE. KM	1600 km by lorry
CAPACITY UTILIZATION (INCLUDING EMPTY RETURN) %	100
VOLUME CAPACITY UTILIZATION FACTOR	=1
BULK DENSITY OF TRANSPORTED PRODUCTS (INCLUDING PACKAGING). KG/M^3	
PRODUCT 1	570
PRODUCT 2	480
PRODUCT 3	655
PRODUCT 4	488

End of life scenario documentation

SCENARIO PARAMETER	PRODUCT 1	PRODUCT 2	PRODUCT 3	PRODUCT 4
COLLECTION PROCESS – KG COLLECTED SEPARATELY	394	331	454	339
COLLECTION PROCESS – KG COLLECTED WITH MIXED WASTE	169	142	194	145
RECOVERY PROCESS – KG FOR RE-USE	0	0	0	0
RECOVERY PROCESS – KG FOR RECYCLING	195	164	224	167
RECOVERY PROCESS – KG FOR ENERGY RECOVERY	187	157	215	161
DISPOSAL (TOTAL) – KG FOR FINAL DEPOSITION	181	152	208	155
SCENARIO ASSUMPTIONS E.G. TRANSPORTATION	End-of-life product is transported 250 km with an average lorry			

BIBLIOGRAPHY

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ABOUT THE MANUFACTURER

Thermory is leading manufacturer of thermally modified wood and sauna materials. Our product assortment includes decking, wall paneling, cladding, and floorboards made of thermally modified wood as well as industrially painted wooden products for indoor and outdoor use. As the world's leading manufacturer of sauna materials and ready-made saunas, we also hold a leading position in the sauna and spa sectors. 90% of our production is exported to more than 50 countries. Thermally modified wood is our signature product. Years of experience and modern cutting-edge technology allow us to bring out the best properties of wood. Thermally modified wood is entirely natural – its characteristics are enhanced using only heat and steam. This chemical-free process results in an environmentally friendly and aesthetically pleasing wood material that is significantly more durable and stable than conventional timber. Unlike chemical impregnation, thermal modification enhances the wood throughout, not just the outer surface. The result is boards that are stable and durable in every sense. At Thermory, we believe the product quality is paramount, so we work hard on mastering our technology and innovation to stay ahead. The thermal modification process takes place in a heating chamber with special sensors, controlled by experienced specialists using a computer. During the thermal modification process, the wood's density decreases, and its structure changes.

EPD AUTHOR AND CONTRIBUTORS

MANUFACTURER	Thermory AS
EPD AUTHOR	Mari Kirss Rangi Maja OÜ www.lcasupport.com
EPD VERIFIER	Sigita Židonienė. Vesta Consulting UAB www.vestaconsulting.lt
EPD PROGRAM OPERATOR	The Building Information Foundation RTS sr
BACKGROUND DATA	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA SOFTWARE	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Wood and plant-fibre based products

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 EN 15804. 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 background report (project report) for this EPD

Why does verification transparency matter?
Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD VERIFICATION INFORMATION	ANSWER
INDEPENDENT EPD VERIFIER RD-PARTY VERIFIER FOR EPD	Sigita Židonienė
EPD VERIFICATION STARTED ON	Date when started
EPD VERIFICATION COMPLETED ON	Date when completed
APPROVER OF THE EPD VERIFIER	The Building Information Foundation RTS sr

AUTHOR & TOOL VERIFICATION	ANSWER
EPD AUTHOR	Mari Kirss
EPD GENERATOR MODULE	Wood and plant-fibre based products
SOFTWARE VERIFICATION DATE	17 January 2021

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 EN 15804:2012+A2:2019.

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.

Sigita Židonienė

ANNEX 1 : ENVIRONMENTAL IMPACTS – EN 15804+A1. CML / ISO 21930

THERMALLY MODIFIED HARDWOOD WITHOUT SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.51E2	1.67E2	3.18E2	8.21E1	1.28E0	0E0	7.14E1	3.28E0	6.28E1	-1.06E2
OZONE DEPLETION POT.	kg $CFC_{-11}e$	2.02E-5	1.18E-5	3.2E-5	1.55E-5	2.24E-8	0E0	1.23E-5	3.28E-7	5.93E-7	-1.24E-5
ACIDIFICATION	kg SO_2e	6.85E-1	4.13E-1	1.1E0	1.69E-1	6.61E-4	0E0	1.58E-1	1.58E-2	6.96E-2	-9.53E-2
EUTROPHICATION	kg PO_4^3e	2.55E-1	4.85E-1	7.4E-1	3.4E-2	7.03E-4	0E0	3.78E-2	1.1E-2	3.56E-2	-9.75E-3
POCP (“SMOG”)	kg C_2H_4e	1.08E-1	2E-2	1.28E-1	1.07E-2	2.44E-5	0E0	1.03E-2	6.49E-4	8.98E-4	-2.24E-2
ADP-ELEMENTS	kg Sbe	3.16E-3	8.81E-4	4.04E-3	1.41E-3	3.56E-6	0E0	3.55E-3	1.29E-5	8.28E-5	-3.46E-4
ADP-FOSSIL	MJ	2.13E3	2.16E3	4.28E3	1.29E3	1.86E0	0E0	1.07E3	6.75E1	5.08E1	-1.79E3

THERMALLY MODIFIED SOFTWOOD WITHOUT SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.26E2	1.68E2	2.94E2	6.92E1	1.28E0	0E0	6.01E1	2.76E0	5.29E1	-8.88E1
OZONE DEPLETION POT.	kg $CFC_{-11}e$	1.52E-5	1.57E-5	3.09E-5	1.3E-5	2.24E-8	0E0	1.04E-5	2.76E-7	4.99E-7	-1.03E-5
ACIDIFICATION	kg SO_2e	6.12E-1	2.45E-1	8.57E-1	1.42E-1	6.61E-4	0E0	1.33E-1	1.33E-2	5.86E-2	-9.17E-2
EUTROPHICATION	kg PO_4^3e	2.08E-1	1.08E-1	3.16E-1	2.87E-2	7.03E-4	0E0	3.19E-2	9.24E-3	3E-2	-7.34E-3
POCP (“SMOG”)	kg C_2H_4e	4.43E-2	1.61E-2	6.04E-2	9E-3	2.44E-5	0E0	8.68E-3	5.46E-4	7.56E-4	-1.1E-2
ADP-ELEMENTS	kg Sbe	2.28E-3	4.78E-4	2.75E-3	1.19E-3	3.56E-6	0E0	2.99E-3	1.09E-5	6.97E-5	-2.6E-4
ADP-FOSSIL	MJ	1.75E3	2.52E3	4.27E3	1.09E3	1.86E0	0E0	8.98E2	5.68E1	4.27E1	-1.5E3

THERMALLY MODIFIED HARDWOOD WITH SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.83E2	1.72E2	3.55E2	9.44E1	1.24E0	0E0	8.23E1	3.79E0	7.24E1	-1.21E2
OZONE DEPLETION POT.	kg $CFC_{-11}e$	2.25E-5	1.62E-5	3.87E-5	1.78E-5	1.63E-8	0E0	1.42E-5	3.79E-7	6.83E-7	-1.43E-5
ACIDIFICATION	kg SO_2e	1.01E0	2.67E-1	1.28E0	1.94E-1	5.92E-4	0E0	1.82E-1	1.82E-2	8.02E-2	-1.09E-1
EUTROPHICATION	kg PO_4^3e	3.3E-1	7.8E-2	4.09E-1	3.91E-2	6.89E-4	0E0	4.36E-2	1.27E-2	4.1E-2	-1.06E-2
POCP (“SMOG”)	kg C_2H_4e	1.28E-1	2.82E-2	1.56E-1	1.23E-2	1.96E-5	0E0	1.19E-2	7.48E-4	1.03E-3	-2.53E-2
ADP-ELEMENTS	kg Sbe	3.57E-3	4.68E-4	4.04E-3	1.62E-3	2.19E-6	0E0	4.09E-3	1.49E-5	9.54E-5	-3.9E-4
ADP-FOSSIL	MJ	2.5E3	2.61E3	5.11E3	1.48E3	1.35E0	0E0	1.23E3	7.78E1	5.85E1	-2.06E3

THERMALLY MODIFIED SOFTWOOD WITH SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.45E2	1.85E2	3.3E2	7.03E1	1.28E0	0E0	6.11E1	2.81E0	5.38E1	-9E1
OZONE DEPLETION POT.	kg $CFC_{-11}e$	1.67E-5	1.64E-5	3.31E-5	1.33E-5	2.24E-8	0E0	1.06E-5	2.81E-7	5.08E-7	-1.05E-5
ACIDIFICATION	kg SO_2e	8.32E-1	2.83E-1	1.12E0	1.44E-1	6.61E-4	0E0	1.35E-1	1.35E-2	5.96E-2	-9.22E-2
EUTROPHICATION	kg PO_4^3e	2.4E-1	8.67E-2	3.27E-1	2.92E-2	7.03E-4	0E0	3.24E-2	9.4E-3	3.05E-2	-7.06E-3
POCP (“SMOG”)	kg C_2H_4e	5.6E-2	2.84E-2	8.44E-2	9.15E-3	2.44E-5	0E0	8.83E-3	5.56E-4	7.69E-4	-1.11E-2
ADP-ELEMENTS	kg Sbe	2.56E-3	5.21E-4	3.08E-3	1.21E-3	3.56E-6	0E0	3.04E-3	1.11E-5	7.09E-5	-2.59E-4
ADP-FOSSIL	MJ	1.95E3	2.62E3	4.57E3	1.1E3	1.86E0	0E0	9.14E2	5.78E1	4.35E1	-1.52E3

ANNEX 2 : ENVIRONMENTAL IMPACTS – TRACI 2.1. / ISO 21930

THERMALLY MODIFIED HARDWOOD WITHOUT SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.49E2	1.67E2	3.17E2	8.2E1	1.28E0	0E0	7.13E1	3.29E0	6.28E1	-1.06E2
OZONE DEPLETION	kg $CFC_{-11}e$	2.69E-5	1.57E-5	4.26E-5	2.06E-5	2.74E-8	0E0	1.64E-5	4.11E-7	6.64E-7	-1.72E-5
ACIDIFICATION	kg SO_2e	9.45E-1	4.72E-1	1.42E0	3.03E-1	9.56E-4	0E0	2.44E-1	1.51E-2	4.01E-2	-1.27E-1
EUTROPHICATION	kg Ne	2.13E-1	9.47E-1	1.16E0	4.26E-2	2.08E-4	0E0	3.54E-2	2.92E-3	9.3E-3	-2.09E-2
POCP (“SMOG”)	kg O_3e	2.26E1	7.34E0	2.99E1	6.65E0	2.46E-2	0E0	4.8E0	1.53E-1	1.08E0	-2.82E0
ADP-FOSSIL	MJ	2.5E2	3.24E2	5.74E2	1.85E2	2.52E-1	0E0	1.48E2	2.61E0	6.5E0	-2.91E2

THERMALLY MODIFIED SOFTWOOD WITHOUT SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.26E2	1.68E2	2.94E2	6.91E1	1.28E0	0E0	6E1	2.77E0	5.29E1	-8.89E1
OZONE DEPLETION	kg $CFC_{-11}e$	2.04E-5	2.16E-5	4.2E-5	1.74E-5	2.74E-8	0E0	1.38E-5	3.46E-7	5.59E-7	-1.43E-5
ACIDIFICATION	kg SO_2e	8.13E-1	2.95E-1	1.11E0	2.55E-1	9.56E-4	0E0	2.06E-1	1.27E-2	3.37E-2	-1.15E-1
EUTROPHICATION	kg Ne	1.25E-1	1.15E-1	2.4E-1	3.59E-2	2.08E-4	0E0	2.98E-2	2.46E-3	7.83E-3	-8.69E-3
POCP (“SMOG”)	kg O_3e	1.89E1	5.4E0	2.43E1	5.6E0	2.46E-2	0E0	4.04E0	1.28E-1	9.12E-1	-2.54E0
ADP-FOSSIL	MJ	1.93E2	4.01E2	5.94E2	1.56E2	2.52E-1	0E0	1.25E2	2.2E0	5.47E0	-2.44E2

THERMALLY MODIFIED HARDWOOD WITH SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.81E2	1.72E2	3.53E2	9.42E1	1.24E0	0E0	8.22E1	3.79E0	7.24E1	-1.22E2
OZONE DEPLETION	kg $CFC_{-11}e$	2.96E-5	2.24E-5	5.21E-5	2.37E-5	1.93E-8	0E0	1.89E-5	4.74E-7	7.66E-7	-1.98E-5
ACIDIFICATION	kg SO_2e	1.25E0	3.14E-1	1.56E0	3.48E-1	8.36E-4	0E0	2.81E-1	1.74E-2	4.62E-2	-1.45E-1
EUTROPHICATION	kg Ne	2.63E-1	4.09E-2	3.04E-1	4.9E-2	1.91E-4	0E0	4.08E-2	3.37E-3	1.07E-2	-2.33E-2
POCP (“SMOG”)	kg O_3e	2.7E1	5.38E0	3.23E1	7.64E0	2.21E-2	0E0	5.53E0	1.76E-1	1.25E0	-3.2E0
ADP-FOSSIL	MJ	2.83E2	4.11E2	6.94E2	2.12E2	1.8E-1	0E0	1.71E2	3.01E0	7.49E0	-3.35E2

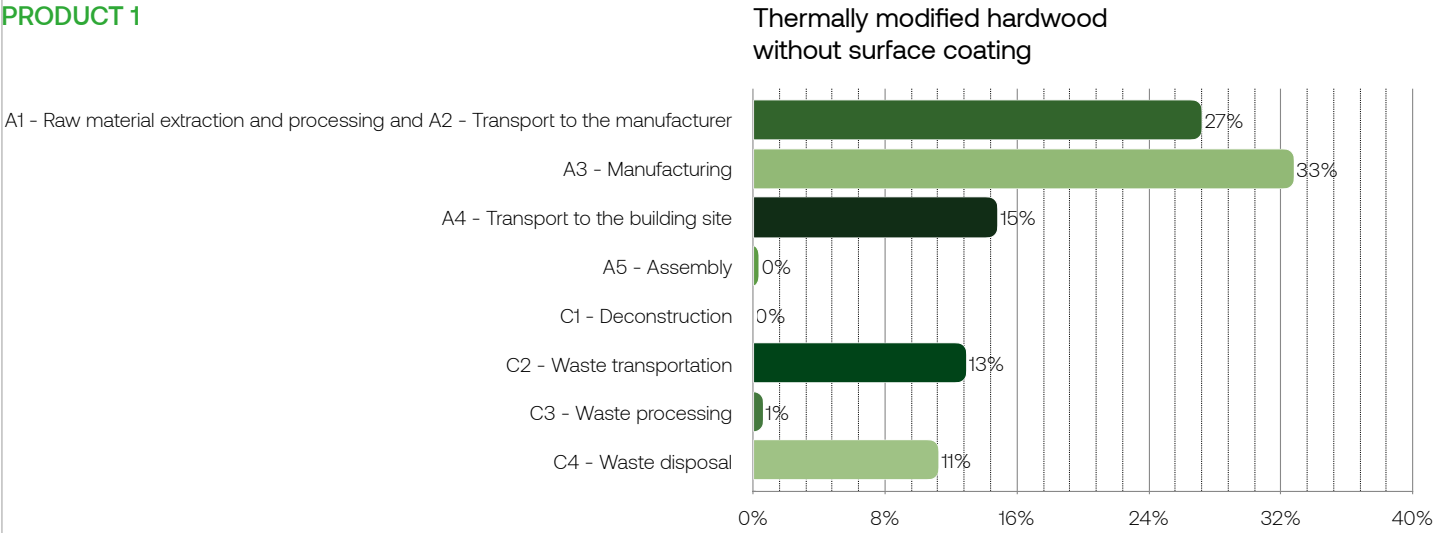
THERMALLY MODIFIED SOFTWOOD WITH SURFACE COATING

IMPACT CATEGORY	UNIT	A1-A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GLOBAL WARMING POT.	kg CO_2e	1.44E2	1.85E2	3.29E2	7.02E1	1.28E0	0E0	6.1E1	2.82E0	5.38E1	-9.02E1
OZONE DEPLETION	kg $CFC_{-11}e$	2.2E-5	2.26E-5	4.46E-5	1.77E-5	2.74E-8	0E0	1.4E-5	3.52E-7	5.69E-7	-1.45E-5
ACIDIFICATION	kg SO_2e	9.8E-1	3.34E-1	1.31E0	2.6E-1	9.56E-4	0E0	2.09E-1	1.29E-2	3.43E-2	-1.16E-1
EUTROPHICATION	kg Ne	1.54E-1	3.93E-2	1.93E-1	3.65E-2	2.08E-4	0E0	3.03E-2	2.5E-3	7.96E-3	-8.53E-3
POCP (“SMOG”)	kg O_3e	1.98E1	5.81E0	2.56E1	5.7E0	2.46E-2	0E0	4.11E0	1.31E-1	9.28E-1	-2.55E0
ADP-FOSSIL	MJ	2.14E2	4.13E2	6.27E2	1.58E2	2.52E-1	0E0	1.27E2	2.23E0	5.57E0	-2.47E2

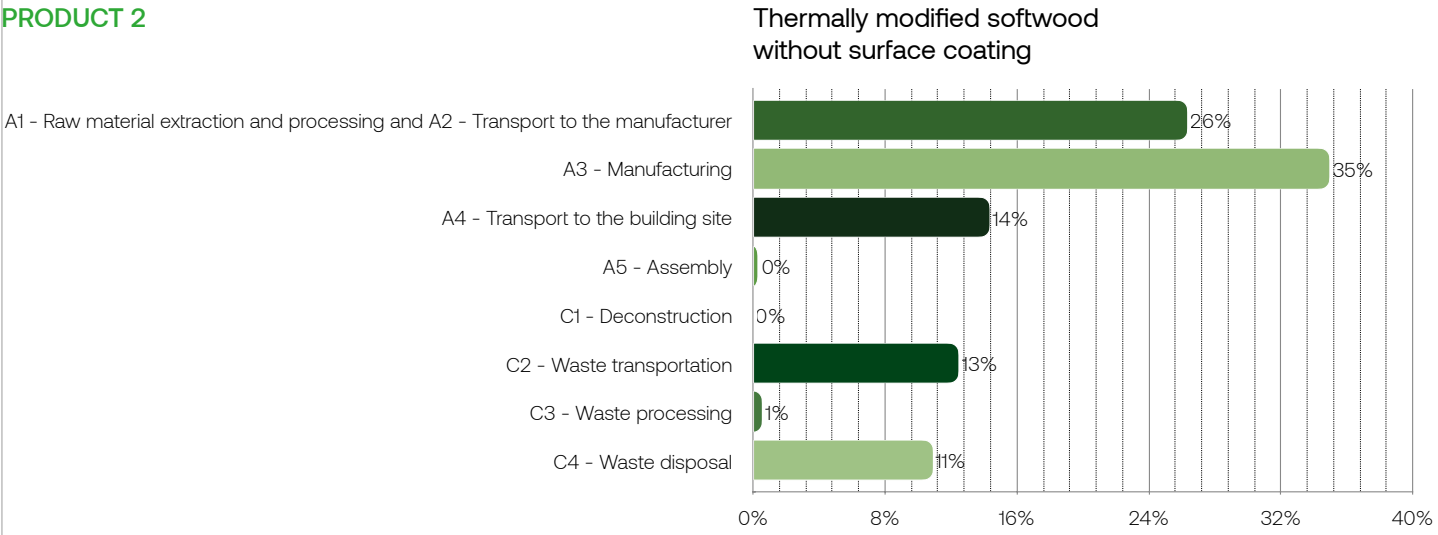
ANNEX 3 : LIFE-CYCLE ASSESSMENT RESULT VISUALIZATION

GLOBAL WARMING POTENTIAL FOSSIL KG CO_2E – LIFE-CYCLE STAGES

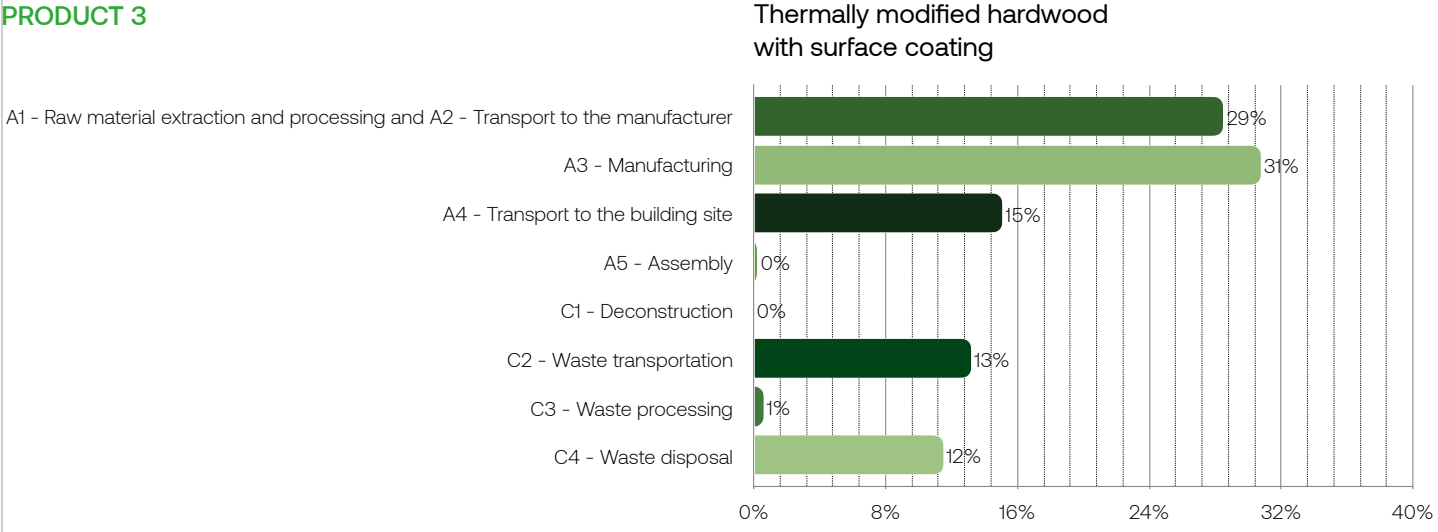
PRODUCT 1



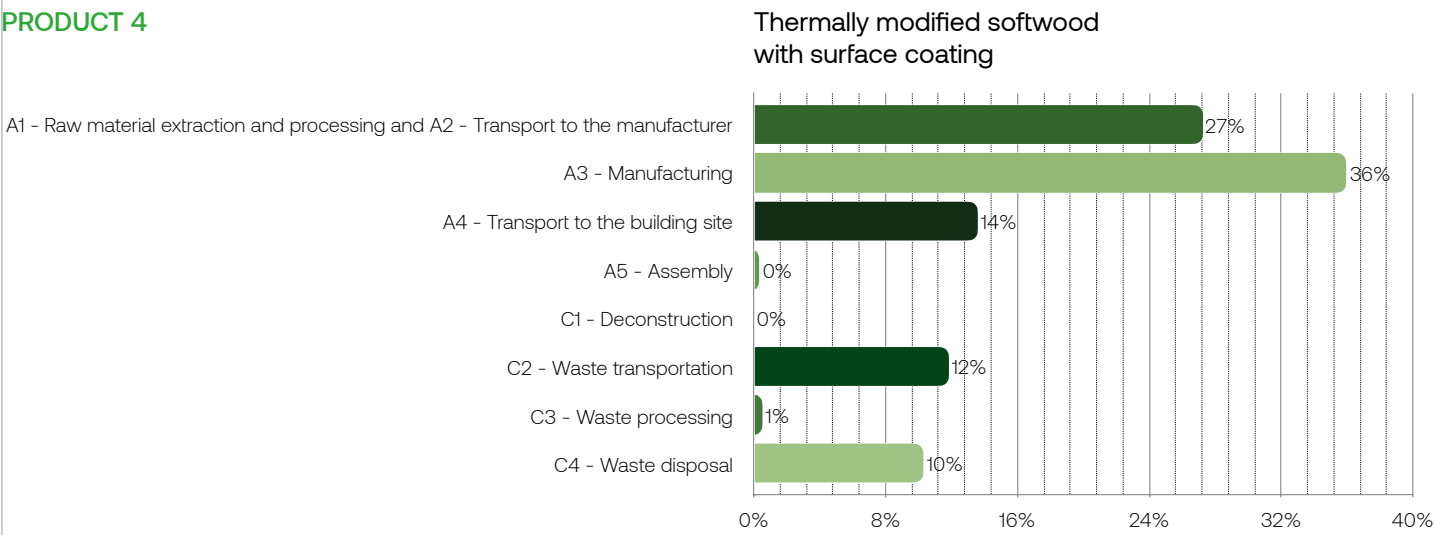
PRODUCT 2



PRODUCT 3



PRODUCT 4


Thermally modified softwood with surface coating
A1 - Raw material extraction and processing and A2 - Transport to the manufacturer
A3 - Manufacturing
A4 - Transport to the building site
A5 - Assembly
C1 - Deconstruction
C2 - Waste transportation
C3 - Waste processing
C4 - Waste disposal
27%
36%
14%
0%
0%
12%
1%
10%
0%
8%
16%
24%
32%
40%