

Environmental Product Declaration



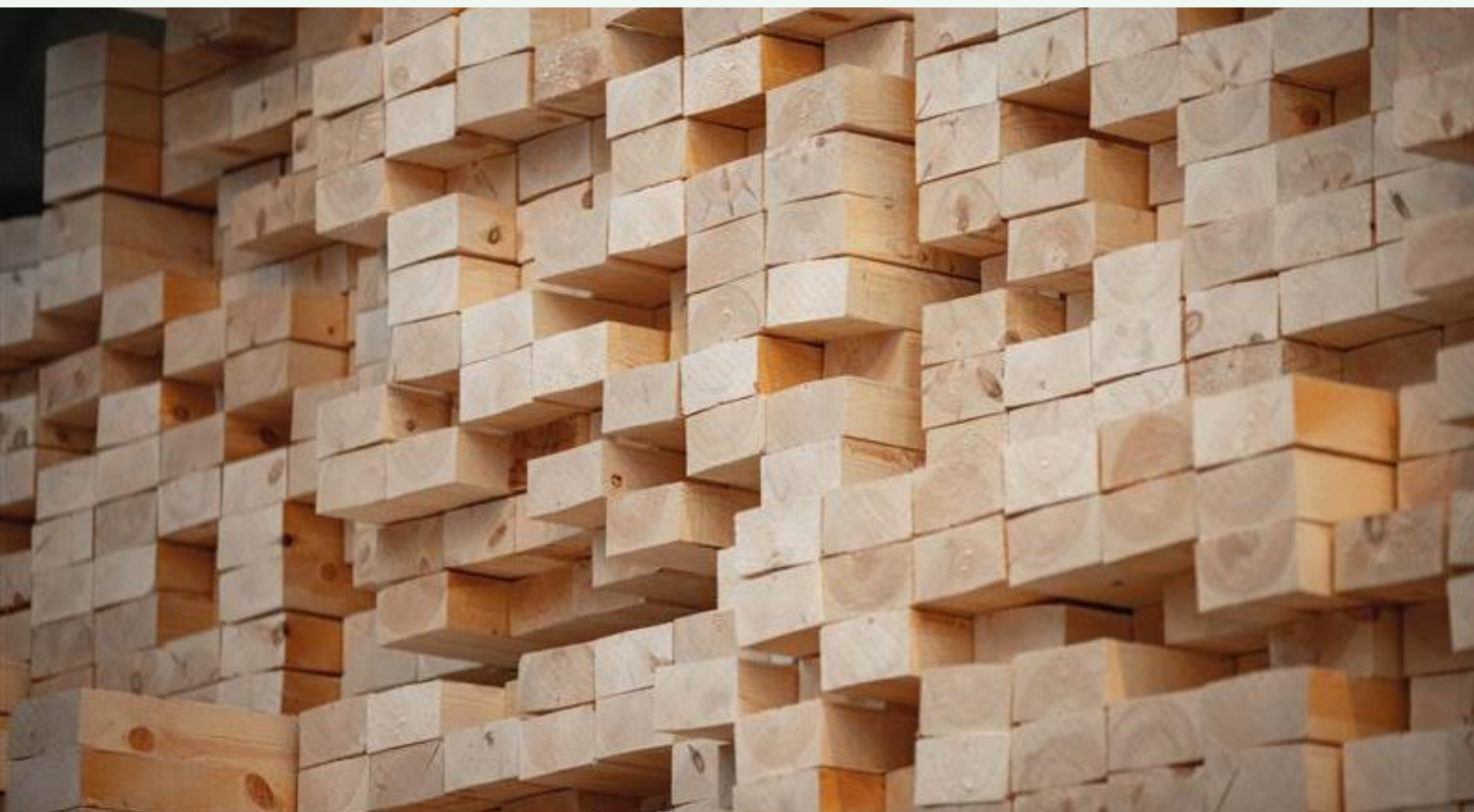
In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019 for:

Standard and special sawn timber from UPM Timber



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 Construction products (version 1.11); c-PCR-006 Wood and wood-based products for use in construction (EN 16485:2014), UN CPC 031, 311, 312, 313, 314, 315, 316 and 319

PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com.

Life Cycle Assessment (LCA)

LCA accountability: Miia Liikanen, UPM-Kymmene Oyj

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third-party verifier: Hannu Karppi, Ramboll Finland Oy



Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: UPM Timber

Contact: Eeva Laaksonen, Manager, Quality and Environment. Email: eeva.laaksonen@upm.com

Description of the organisation: UPM Timber is a significant Nordic sawn timber producer for a wide range of end-uses in construction, such as decking, moulding, panelling, flooring and framing. UPM Timber has four sawmills in Finland with approximately 1.4 million m³/a production capacity in total. UPM Timber uses wood only from responsibly managed forests in Finland and all sawn timber can be sold either as PEFC/02-34-05 or FSC® certified (FSC C086359). With seven global sales offices, UPM Timber delivers sawn timber across the globe.

Product-related or management system-related certifications: PEFC and FSC® Chain of Custody (CoC) certificates; ISO 14001, 45001 and 9001 certificates; EN 13183-1,2,3 (INSTA141), 1313-1, 1611, 336 and 14081-1 product standards.

Name and location of production site(s):

UPM Timber Headquarters: Peltokatu 26 C, P.O. Box 203, FI-33101 Tampere, Finland

Kaukas sawmill: Kaukaantie 16, FI-53200 Lappeenranta, Finland

Alholma sawmill: Pormestarinsaarentie 7 P.O. Box 137, FI-68600 Pietarsaari, Finland

Korkeakoski sawmill: Sahantie 10 P.O. Box 25, FI-35501 Korkeakoski, Finland

Seikku sawmill: Aittaluoto, P.O. Box 80, FI-28101 Pori, Finland

Product information

Product name: Standard and special sawn timber

Product identification: Standard and special sawn timber grades and dimensions with unambiguous shipping marks, identified customer products and strength graded sawn timber CE marking (EN 14081)

Product description: UPM Timber produces both standard and special sawn timber in four sawmills in Finland. This EPD represents average sawn timber covering both product ranges. In addition, this EPD represents all UPM sawmills (average EPD with multiple manufacturing sites). Sawn timber is made of responsibly sourced Nordic pine and spruce. Sawn timber is dried to approximately 17% moisture content and is not further processed, e.g. planed. Sawn timber is packed in bundles and transported to customers across the globe. Sawn timber has various end-uses in construction, such as decking, moulding, panelling, flooring and framing. Due to various end-use possibilities, expected service life is not declared in this EPD.

UN CPC code: 311

Geographical scope: Global, end-of-life stage is assessed based on average European scenario

LCA information

Declared unit: 1 m³ of sawn dried timber

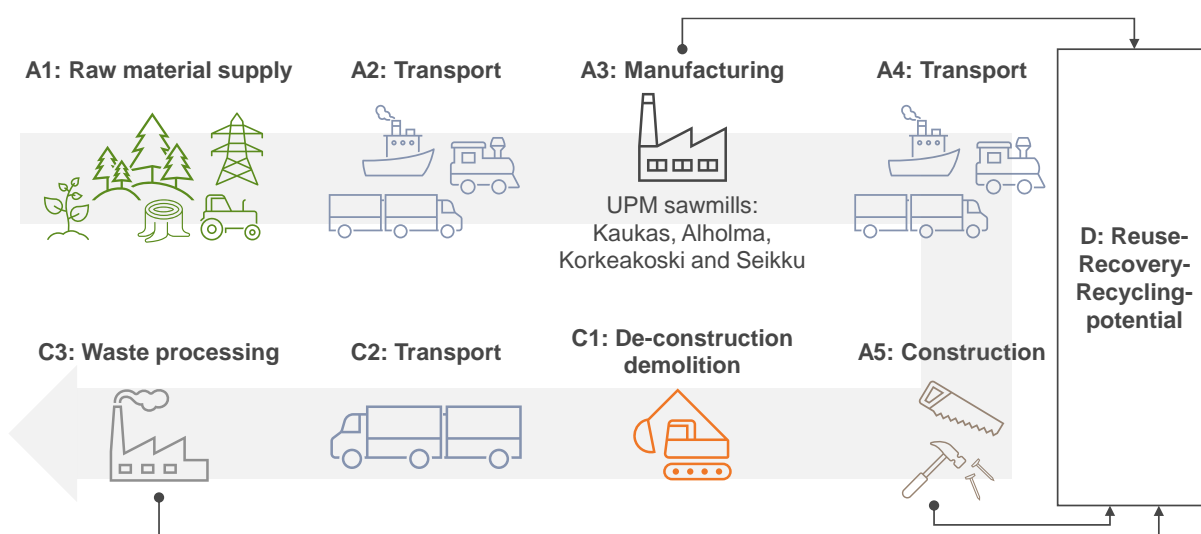


Time representativeness: Primary data for sawmill operations represents year 2021. Time representativeness of secondary data was good on average.

Database(s) and LCA software used: GaBi Professional and Ecoinvent (version 3.8) LCA databases were used as secondary data source. GaBi LCA software (version 10.6) was used.

Description of system boundaries: The system boundaries are “Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules)” (type B). Use stage (B module) is not included in system boundaries because default scenario for end-use cannot be declared.

System diagram:



LCA practitioner: Researcher Miia Liikanen (D.Sc. Tech.), UPM Northern European Research Centre. Contact: miia.liikanen@upm.com

Cut-off rules: As general cut-off criterion, at minimum 95% of total input flows (mass and energy) per module are accounted for. Flows which account less than 1% of the total input mass or energy are excluded if appropriate life cycle inventory (LCI) or approximation data is not available. Thus, cut-off criterion is used if needed (minor inputs are not automatically excluded from the study if LCI or approximation data is available).

Allocation: As a general rule, allocation is avoided if possible. However, allocation cannot be avoided in the assessed product system because sawmills produce multiple products. Sawn timber is the main product of sawmills. Co-products, such as sawdust, bark and woodchips, are also generated in sawmills. Sawmill operations cannot be sub-divided into individual unit processes so that environmental impacts are assigned separately for different products. Therefore, environmental impacts need to be allocated between different products of sawmills. Economic values are applied to allocate environmental impacts between sawn timber and co-products because the difference in revenues from timber and co-products is higher than 25% (EN 16485:2014). Economic allocation is not applied for heat use and packaging material because they are used only for timber.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation (X = included; ND = not declared):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage		
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	ND	X		
Geography	FI	FI	FI	GLO	GLO	-	-	-	-	-	-	-	GLO	GLO	EU-28	-	EU-28		
Specific data used	A1-A3: 38%					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	A1-A3: Variation between manufacturing sites is approximately ± 12%					-	-	-	-	-	-	-	-	-	-	-	-	-	-

A1 – Raw material supply: UPM Timber uses pine and spruce from responsibly managed forests in Finland. This life cycle stage covers environmental impacts of wood supply including i.a. the following unit processes: seedling nursery, site preparation, forestry operations and harvesting. In addition to raw material supply, the production of energy used in manufacturing stage (A3) is assessed in A1 module. Electricity used in UPM sawmills is generated in the recovery boilers of UPM pulp mills. The environmental impacts of recovery boilers are allocated to the products of pulp mills, i.e. pulp and possible co-products, such as turpentine and crude tall oil. The electricity recovered from black liquor in recovery boilers does not carry any environmental impacts from previous life cycle stages. Heat is used in sawmills to decrease the moisture content of sawn timber. Heat is produced either from co-products of sawmills or from black liquor in recovery boilers of UPM pulp mills.

A2 – Transport: This life cycle stage includes the transportation of pine and spruce logs to UPM sawmills. Primary data was used for transportation distances and modes.

A3 – Manufacturing: Once pine and spruce logs are transported to UPM sawmills, they are first stored in log yards. Logs are then directed to debarking and then sawed to given dimensions. Multiple co-products are generated in debarking and sawing (e.g. bark, sawdust and woodchips). After debarking and sawing, heat is used to decrease the moisture content of timber. In addition to heat, electricity and working machines are used in sawmills (please note that the production electricity and heat used in manufacturing is included in A1 stage). Timber with approximately 17% moisture content is packed in bundles with plastic wrapping and steel or PET bands. Treatment of packaging material not leaving sawmills together with timber is included in this stage.

A4 – Transport: The market countries of UPM Timber include countries from Europe, Asia and Africa. This life cycle stage assesses the environmental impacts generated in the transportation of timber to customers. Weighted average distances for truck and ship transportation were calculated based on market division of sold timber in 2021. Market division was determined at country level and market countries with more than 1% share of sold timber in 2021 were considered. Sawn timber sold to these countries represents 97% of sold timber in 2021. Truck transportation distances were estimated with the assumption of 200 km transportation from sawmill to port and same transportation distance in the market country. Truck transportation distances were assumed due to lack of data on exact logistical routes. Ship transportation distances were estimated with an online tool for ship transportation routes. Weighted average transportation distances were 359 km by truck and 7 007 km by ship.

A5 – Construction installation: Once sawn timber is transported to customer, it is unpacked and used for intended purpose. The treatment of packaging waste is included in this life cycle stage. Because sawn timber has various end-use possibilities in construction, specific end-use scenario cannot be declared herein. Therefore, no other environmental impacts are considered in this stage than environmental impacts generated in the treatment of packaging waste. Plastic packaging waste is directed to energy recovery and steel packaging waste to material recovery.

B – Use stage: Sawn timber has multiple end-uses and default scenario for use stage cannot be defined. Therefore, use stage is excluded from the assessment.

C1 – De-construction demolition: Deconstruction and demolition are assumed to be carried out by a construction excavator. The environmental impacts of C1 module are due to the production and combustion of fuel (diesel) used by excavator.

C2 – Transport: After the deconstruction/demolition stage, timber waste is transported to waste treatment plant. 200 km truck transportation distance is assumed for C2 module.

C3 – Waste processing: Incineration with energy recovery is assumed as waste treatment method in this EPD. Environmental impacts generated in energy recovery are assessed in C3 module. Timber could also be used as material but material recovery option was considered to contain more uncertainty because wood can be utilised as material in multiple ways, e.g. in particleboard or composite production. Landfill disposal was not considered as possible waste treatment method due to the landfill ban of organic waste in the EU.

C4 – Disposal: No environmental impacts are generated in C4 module and, therefore, C4 module is excluded from the assessment.

D – Reuse-Recovery-Recycling-potential: Benefits (i.e. credits) beyond the system boundary are considered for energy and material recovered in waste treatment (incineration with energy recovery and material recovery) of packaging materials (in A3 and A5 modules) and timber after it has reached the end of service life (in C3 module).

Content information

Sawn timber with 17% moisture content	Fresh density (kg/m ³)	Post-consumer material, weight-%	Renewable material, weight-%
Redwood - pine	557	0%	100%
Whitewood - spruce	466	0%	100%
Weighted average	523	0%	100%
Packaging materials	Weight, kg	Weight-% (versus the product)	
Plastic (LLDPE and PP) wrapping	0.47	0.09%	
Plastic (PET) bands	0.14	0.03%	
Steel bands (only used in one sawmill)	0.002	0.0003%	
TOTAL	0.61	0.12%	

There are no SVHC substances in the product.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit													
Indicator	Unit	A1	A2	A3	Total A1-A3	Range A1-A3**		A4	A5	C1	C2	C3	D
GWP-fossil	kg CO ₂ eq.	1,92E+01	1,04E+01	4,51E+00	3,41E+01	3,23E+01	- 3,61E+01	4,30E+01	1,70E+00	3,37E-01	6,86E+00	1,35E+01	-2,98E+02
GWP-biogenic	kg CO ₂ eq.	-7,86E+02	3,54E-02	1,04E-02	-7,86E+02	-8,43E+02	- -7,06E+02	7,72E-02	9,68E-05	1,14E-03	2,40E-02	7,87E+02	-1,59E+00
GWP-luluc	kg CO ₂ eq.	4,61E-01	6,71E-02	1,47E-03	5,29E-01	4,65E-01	- 6,20E-01	8,32E-02	5,33E-05	2,19E-03	4,62E-02	1,78E-03	-3,23E-02
GWP-total	kg CO ₂ eq.	-7,67E+02	1,05E+01	4,53E+00	-7,52E+02	-8,10E+02	- -6,69E+02	4,31E+01	1,70E+00	3,41E-01	6,93E+00	8,00E+02	-2,99E+02
ODP	kg CFC 11 eq.	3,84E-06	9,83E-13	2,31E-08	3,86E-06	3,62E-06	- 4,15E-06	2,97E-12	8,70E-14	3,19E-14	6,73E-13	7,06E-11	-1,97E-09
AP	mol H ⁺ eq.	1,34E-01	3,65E-02	1,68E-02	1,87E-01	1,55E-01	- 2,23E-01	1,16E+00	1,93E-04	1,63E-03	2,23E-02	1,33E-01	-3,86E-01
EP-freshwater	kg PO ₄ ³⁻ eq.	1,39E-02	1,09E-04	8,48E-04	1,49E-02	1,32E-02	- 1,70E-02	1,56E-04	1,44E-07	3,56E-06	7,51E-05	5,17E-05	-1,24E-03
	kg P eq.	4,54E-03	3,56E-05	2,76E-04	4,85E-03	4,30E-03	- 5,55E-03	5,08E-05	4,70E-08	1,16E-06	2,45E-05	1,69E-05	-4,03E-04
EP-marine	kg N eq.	5,56E-02	1,61E-02	6,96E-03	7,86E-02	6,22E-02	- 9,72E-02	3,16E-01	4,86E-05	7,64E-04	1,01E-02	4,36E-02	-1,05E-01
EP-terrestrial	mol N eq.	5,84E-01	1,80E-01	7,52E-02	8,39E-01	6,57E-01	- 1,04E+00	3,46E+00	9,14E-04	8,47E-03	1,14E-01	6,33E-01	-1,13E+00
POCP	kg NMVOC eq.	3,27E-01	3,30E-02	2,05E-02	3,80E-01	2,30E-01	- 5,49E-01	8,67E-01	1,32E-04	2,14E-03	2,00E-02	1,18E-01	-2,95E-01
ADP-minerals&metals*	kg Sb eq.	4,78E-05	1,02E-06	1,22E-06	5,00E-05	4,73E-05	- 5,32E-05	2,36E-06	2,86E-09	3,27E-08	6,90E-07	1,72E-06	-4,43E-05
ADP-fossil*	MJ	2,86E+02	1,40E+02	8,96E+01	5,16E+02	4,99E+02	- 5,36E+02	5,32E+02	3,17E-01	4,26E+00	8,99E+01	1,95E+02	-5,05E+03
WDP	m ³	3,19E+00	1,17E-01	5,68E-01	3,88E+00	3,34E+00	- 4,34E+00	1,92E-01	1,55E-01	3,63E-03	7,66E-02	9,75E+01	-3,06E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption												

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

** Range between sawmills with lowest and highest impact.

Potential environmental impact – additional mandatory and voluntary indicators

Results per functional or declared unit													
Indicator	Unit	A1	A2	A3	Total A1-A3	Range A1-A3**		A4	A5	C1	C2	C3	D
GWP-GHG*	kg CO ₂ eq.	1,92E+01	1,03E+01	4,44E+00	3,40E+01	3,22E+01	- 3,60E+01	4,26E+01	1,70E+00	3,36E-01	6,83E+00	1,32E+01	-2,95E+02
Particulate matter emissions	Disease incidence	1,38E-06	2,53E-07	2,65E-07	1,89E-06	1,56E-06	- 2,65E-06	1,95E-05	1,13E-09	1,85E-08	1,32E-07	6,54E-07	-3,19E-06
Ionizing radiation, human health**	kBq U235 eq.	1,33E+00	2,43E-01	1,34E-01	1,71E+00	1,52E+00	- 2,03E+00	1,07E-01	2,16E-03	1,20E-03	2,53E-02	1,89E+00	-6,56E+01
Eco-toxicity (freshwater)***	CTUe	2,35E+02	9,64E+01	5,77E+01	3,89E+02	3,70E+02	- 4,12E+02	3,72E+02	1,69E-01	3,02E+00	6,37E+01	8,60E+01	-1,08E+03
Human toxicity, cancer effects***	CTUh	1,96E-08	1,95E-09	1,76E-09	2,33E-08	2,13E-08	- 2,59E-08	7,12E-09	1,21E-11	6,23E-11	1,31E-09	5,86E-09	-5,07E-08
Human toxicity, non-cancer effects***	CTUh	3,39E-07	1,21E-07	1,18E-07	5,78E-07	5,09E-07	- 6,40E-07	3,67E-07	4,45E-10	3,90E-09	8,10E-08	2,05E-07	-1,95E-06
Land use related impacts / Soil quality***	-	1,14E+05	5,61E+01	3,23E+00	1,14E+05	1,04E+05	- 1,30E+05	6,94E+01	1,09E-01	1,80E+00	3,81E+01	5,77E+01	-8,85E+02

* The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

** 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.

*** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Use of resources

Results per functional or declared unit													
Indicator	Unit	A1	A2	A3	Total A1-A3	Range A1-A3**		A4	A5	C1	C2	C3	D
PERE	MJ	1,83E+04	9,66E+00	2,52E+00	1,83E+04	1,63E+04	- 2,07E+04	1,26E+01	6,07E-02	2,95E-01	6,23E+00	4,52E+01	-1,36E+03
PERM	MJ	8,15E+03	0,00E+00	0,00E+00	8,15E+03	7,32E+03	- 8,74E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,64E+04	9,66E+00	2,52E+00	2,65E+04	2,42E+04	- 2,94E+04	1,26E+01	6,07E-02	2,95E-01	6,23E+00	4,52E+01	-1,36E+03
PENRE	MJ	2,86E+02	1,41E+02	8,97E+01	5,16E+02	5,00E+02	- 5,37E+02	5,33E+02	3,17E-01	4,28E+00	9,03E+01	1,95E+02	-5,05E+03
PENRM	MJ.	2,36E+01	0,00E+00	0,00E+00	2,36E+01	1,62E+01	- 2,83E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,10E+02	1,41E+02	8,97E+01	5,40E+02	5,28E+02	- 5,62E+02	5,33E+02	3,17E-01	4,28E+00	9,03E+01	1,95E+02	-5,05E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	- 0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	- 0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	- 0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,01E-01	1,27E-02	1,51E-02	1,29E-01	1,06E-01	- 1,46E-01	1,52E-02	3,64E-03	3,41E-04	7,20E-03	2,29E+00	-1,30E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water												

Waste production and output flows

Waste production

Results per functional or declared unit														
Indicator	Unit	A1	A2	A3	Total A1-A3	Range A1-A3**			A4	A5	C1	C2	C3	D
							-							
Hazardous waste disposed	kg	1,42E-10	1,10E-09	2,39E-09	3,63E-09	2,95E-09	-	4,90E-09	2,37E-09	2,10E-11	2,26E-11	4,78E-10	1,88E-08	-6,89E-07
Non-hazardous waste disposed	kg	4,37E-01	2,35E-02	1,88E-02	4,79E-01	4,22E-02	-	1,64E+00	6,13E-02	6,95E-03	6,97E-04	1,47E-02	6,76E+00	-2,53E+00
Radioactive waste disposed	kg	7,10E-04	2,32E-03	2,98E-04	3,33E-03	1,48E-03	-	6,60E-03	7,23E-04	1,34E-05	7,95E-06	1,68E-04	1,15E-02	-3,88E-01

Output flows

Results per functional or declared unit														
Indicator	Unit	A1	A2	A3	Total A1-A3	Range A1-A3**			A4	A5	C1	C2	C3	D
							-							
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	1,52E-04	1,52E-04	0,00E+00	-	7,27E-04	0,00E+00	1,67E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	3,79E-02	3,79E-02	5,61E-03	-	5,95E-02	0,00E+00	5,75E-01	0,00E+00	0,00E+00	5,19E+02	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	2,19E-01	2,19E-01	3,43E-02	-	3,12E-01	0,00E+00	3,39E+00	0,00E+00	0,00E+00	1,36E+03	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	3,89E-01	3,89E-01	6,10E-02	-	5,56E-01	0,00E+00	6,03E+00	0,00E+00	0,00E+00	2,44E+03	0,00E+00

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	2,15E+02
Biogenic carbon content in packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

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