

# EPD

Environmental Product Declaration



## Cladding and Decking by Stora Enso

**Product:** Cladding and Decking are a solid wood construction products for interior and exterior uses

**Manufacturer:** Stora Enso Wood Products Oy Ltd, P.O.Box 309, FI-00101 Helsinki, Finland

**Manufacturing sites:** Amsterdam (Netherlands), Brand (Austria), Bad St. Leonhard (Austria), Gruvön (Sweden), Honkalahti (Finland), Kitee (Finland), Nebolchi (Russia), Plana (Czech Republic), Ybbs an der Donau (Austria), Zdirec (Czech Republic)

**Declared unit:** 1 m<sup>3</sup> of planed timber

**Approval date:** 2018-06-18

**Valid until:** 2023-06-17

**Reference year:** 2014

The declaration is calculated on the basis of standards ISO 14025, EN 15804+A1 and EN 16485. EPDs of construction products may not be comparable if they do not comply with these standards.

**Verification:** CEN standard EN 15804 serves as the core product category rules. Verification of the declaration and data, according to EN ISO 14025.

internal verification     external verification

**Third party verifier:**

Teija Käpynen  
Vahanen Environment Oy



# Stora Enso

Stora Enso is a leading provider of renewable solutions in packaging, biomaterials, wood and paper to global markets. Our customers include the packaging, joinery and construction industries as well as publishers, printing houses and paper merchants. Our aim is to replace non-renewable materials by innovating and developing new products and services based on wood and other renewable materials. Our focus is on fibre-based packaging, plantation-based pulp, innovations in biomaterials, and sustainable building solutions.

Stora Enso's Wood Products division is a market-leading provider of innovative wood-based products for construction and interior usages. Our product range covers all areas of urban construction including massive wood elements, wood components and pellets. We offer a variety of sawn timber goods. All our mills run an integrated management system, which is certified in accordance with Chain of Custody (FSC® and/or PEFC™), quality management (ISO 9001), energy management (ISO 50001), environmental management (ISO 14001), and health and safety (OHSAS 18001) requirements.

## Sustainability at Stora Enso

For Stora Enso, sustainability means realising concrete actions that will help us fulfil our Purpose, which is to 'Do good for the people and the planet', and to create shared value. Our values, Lead and Do what's right, guide our sustainability agenda. Our values are about setting high ethical standards in all of the work we do. As a global company we consistently act in accordance with our values, policies and guidelines everywhere we operate.

We comply with and when necessary go beyond the requirements of national legislation and regulations. We also expect our business partners and suppliers to comply with Stora Enso's policies and guidelines on Sustainability and Business Ethics. Social, environmental, and economic sustainability form the triple bottom line. Sustainability at Stora Enso is about increase positive impacts on humans, the planet, and the economy, and minimising negative ones.

## Product

This declaration covers Stora Enso planed and profiled and interior and exterior products, as cladding, wall, ceiling and flooring.

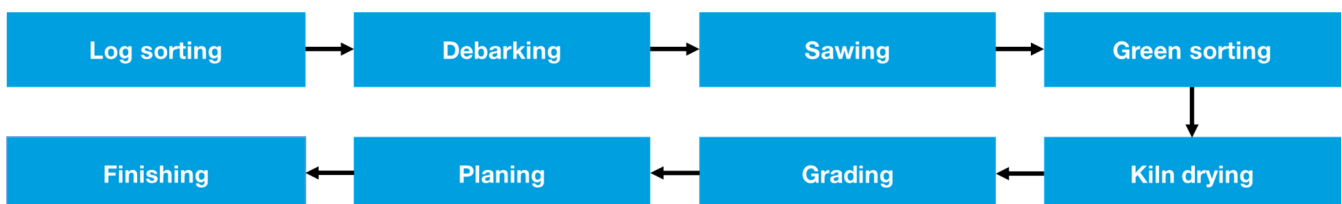
### Technical information of products

		Cladding	Flooring
Wood species*		Pine or spruce	Pine or spruce
Wood moisture	%	8–16 ± 2	8-18 ± 2
Composition		wood (100%)	wood (100%)
Thickness	mm	7–28,5	18–29
Widths	mm	82–280	88–146
Lengths	m	1,8–6	2,1–6
Weight approx.	kg/m <sup>3</sup>	445	445
Visual quality		Exterior and interior	Interior

\* Wood species: spruce (*Picea abies*), pine (*Pinus sylvestris*)

### Production steps

Raw material of sawn timber are sawn logs, which are sorted in sawmill by the diameter, quality and length. Logs are debarked and scanned before sawing. After sawing boards are sorted by dimensions and splinting for drying. Drying is done in a kiln according wood species and dimensions. Dry timber is graded by quality. Products are planed to final profiles and finished.



# Life cycle assessment rules and scenarios

This environmental product declaration covers life cycle information from the product stage (modules A1–A3) and from a scenario based end of life stage (modules C1–C4). Supplementary information beyond the building life cycle is also provided (module D). Other life cycle phases (A4–B7) are excluded. Type of EPD is cradle to gate with options.

## Assessment rules

Life cycle assessment is done according ISO 14044 standard. Declared unit of calculation is 1 m<sup>3</sup> of planed timber. The EPD is representative of 90% of planed timber manufactured by Stora Enso. Product is manufactured in Amsterdam (Netherlands), Brand (Austria), Bad St. Leonhard (Austria), Gruvön (Sweden), Honkalahti (Finland), Kitee (Finland), Nebolchi (Russia), Plana (Czech Republic), Ybbs an der Donau (Austria), Zdirec (Czech Republic), therefore results are shown in production capacity weighted average results.

Standards EN 15804 and EN 16485 serves as the core product category rules for the assessment. Standard EN 15942 serves communication format for the EPD. Biogenic carbon content of wood is calculated by EN 16449 standard.

Data inventory have been done from Stora Enso production units covering production data (12 months) of year 2014. All inputs and outputs of units are recorded and included in the calculations. Some assumption are made for reduction factors of by-products and energy use in different process steps. Three data sources were used for the assessment: Ecoinvent datasets were used for material/energy processes, Lipasto datasets were used for transportation processes and Metsäteho data for wood supply (data produced from Stora Enso own forest operations).

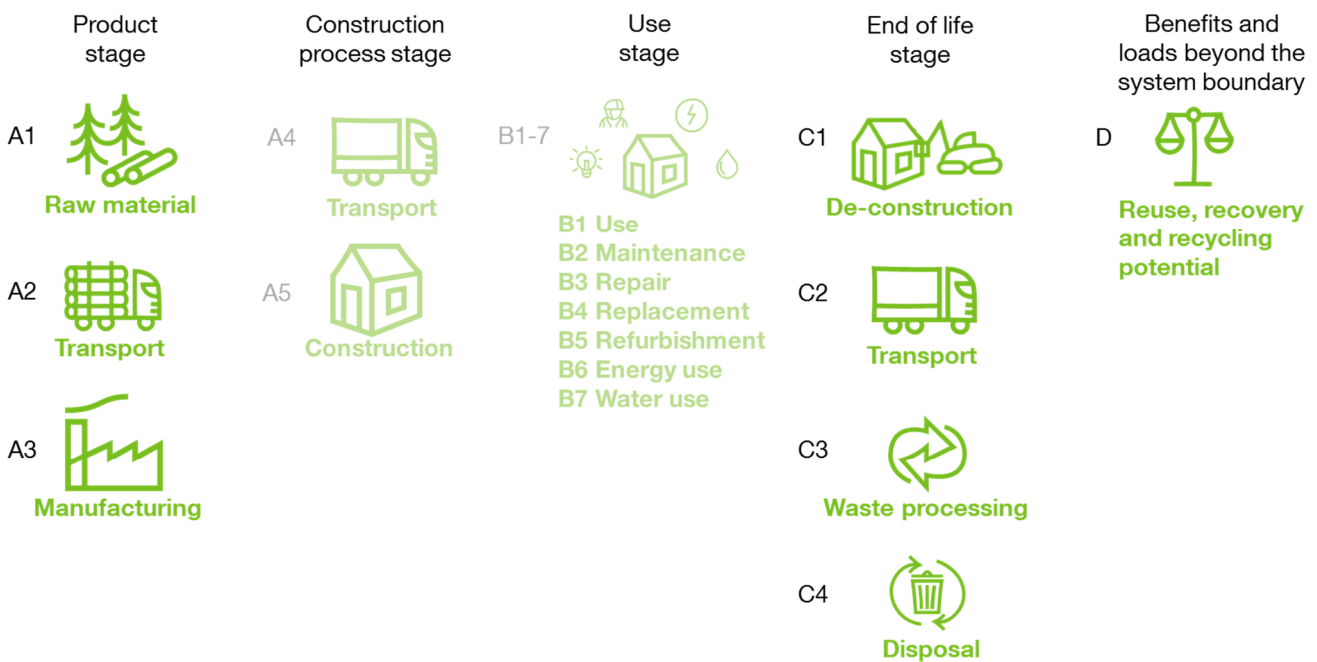
## End of life scenario

**Reuse:** Sawn timber is reused in coherent form. C1: demolition of the building, C2: transportation to the sorting 50 km, C3: preparing for reuse, C4: product for reuse, D: reuse of product

**Recycling:** Sawn timber chipping cover virgin wood chips. C1: demolition of the building, C2: transportation to the sorting 50 km, C3: preparing for recycling, C4: chips to recycling, D: recovery of virgin material

**Incineration:** Sawn timber incineration substitute natural gas. C1: demolition of the building, C2: transportation to the sorting 50 km, C3: preparing for incineration, C4: chips to incineration (70% efficiency), D: substitution of natural gas in heat production

**Landfilling:** Sawn timber is landfilled. C1: demolition of the building, C2: transportation to the sorting 50 km, C3: preparing for landfilling, C4: chips to landfilling.



# Environmental performance

The planned timber EPD includes information on the use of resources, potential environmental impacts, and waste production. The declared unit is one cubic meter of sawn timber. The results per declared unit are presented by life cycle modules (A1–A3, C1–C4 and D). Energy values (MJ) are presented in the results as net calorific values.

## ENVIRONMENTAL IMPACTS

Parameters describing environmental impacts		Global warming potential	Depletion potential of stratospheric ozone layer	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil)
		GWP	ODP	AP	EP	POCP	ADPE	ADPF
		kg CO <sub>2</sub> -eq	kg CFC 11-eq	kg SO <sub>2</sub> -eq	kg PO <sub>4</sub> <sup>3-</sup> -eq	kg Ethene-eq	kg Sb-eq	MJ
<b>Product stage</b>	A1–A3	-698	6,69E-06	1,92E-01	1,14E-01	8,36E-03	2,19E-05	451
<b>Reuse 100%</b>								
De-construction	C1	0,551	5,86E-07	5,30E-03	8,27E-04	1,36E-04	2,49E-07	44,9
Transport	C2	2,26	0	7,21E-03	1,87E-03	3,50E-05	0	32,5
Waste processing	C3	727	4,74E-08	8,46E-04	5,54E-03	2,73E-05	9,28E-08	5,91
Disposal	C4	0	0	0	0	0	0	0
Re-use potential	D	-25,8	-6,05E-06	-0,179	-0,106	-8,16E-03	-2,16E-05	-367
<b>Recycling 100%</b>								
De-construction	C1	0,551	5,86E-07	5,30E-03	8,27E-04	1,36E-04	2,49E-07	44,9
Transport	C2	2,26	0	7,05E-03	1,83E-03	3,42E-05	0	31,8
Waste processing	C3	730	4,42E-07	3,25E-02	1,57E-02	3,62E-04	5,48E-06	58,4
Disposal	C4	0	0	0	0	0	0	0
Recycling potential	D	-13,5	-4,64E-06	-5,64E-02	-8,10E-02	-4,21E-03	-5,27E-07	-153
<b>Incineration 100%</b>								
De-construction	C1	0,551	5,86E-07	5,30E-03	8,27E-04	1,36E-04	2,49E-07	44,9
Transport	C2	2,26	0	7,05E-03	1,83E-03	3,42E-05	0	31,8
Waste processing	C3	730	4,42E-07	3,25E-02	1,57E-02	3,62E-04	5,48E-06	58,4
Disposal	C4	15,8	3,84E-06	1,09	0,447	6,39E-02	6,92E-05	127
Recovery potential	D	-368	-5,40E-05	0,635	0,346	4,32E-02	4,26E-05	-6647
<b>Landfilling 100%</b>								
De-construction	C1	0,551	5,86E-07	5,30E-03	8,27E-04	1,36E-04	2,49E-07	44,9
Transport	C2	2,26	0	7,05E-03	1,83E-03	3,42E-05	0	31,8
Waste processing	C3	730	4,42E-07	3,25E-02	1,53E-02	3,62E-04	5,48E-06	58,4
Disposal	C4	20,26	1,33E-06	6,86E-02	1,11	3,49E-03	9,05E-06	151
Recovery potential	D	0	0	0	0	0	0	0

\* A1–A3 GWP: emissions from the production stage 29 kg CO<sub>2</sub>-eq and biogenic carbon storage in wood -727 kg CO<sub>2</sub>-eq

## USE OF RESOURCES

Parameters describing resource use		Use of renewable primary energy resources as energy	Use of renewable primary energy resources as raw material	Total use of renewable primary energy resources	Use of non-renewable primary energy resources as energy	Use of non-renewable primary energy resources as raw material	Total use of non-renewable primary energy resources
		MJ	MJ	MJ	MJ	MJ	MJ
<b>Product stage</b>	A1–A3	1720	7670	9400	450	0	450
<b>Reuse 100%</b>							
De-construction	C1	0,17	0	0,17	44,9	0	44,9
Transport	C2	0	0	0	32,2	0	32,2
Waste processing	C3	2,95	-7670	-7667	5,95	0	5,95
Disposal	C4	0	0	0	0	0	0
Re-use potential	D	-1717	0	-1717	-367	0	-367
<b>Recycling 100%</b>							
De-construction	C1	0,17	0	0,17	44,9	0	44,9
Transport	C2	0	0	0	31,5	0	31,5
Waste processing	C3	9,74	-7670	-7660	59,3	0	59,3
Disposal	C4	0	0	0	0	0	0
Recycling potential	D	-678	0	-678	-152	0	-152
<b>Incineration 100%</b>							
De-construction	C1	0,17	0	0,17	44,9	0	44,9
Transport	C2	0	0	0	31,5	0	31,5
Waste processing	C3	9,74	-7670	-7660	59,3	0	59,3
Disposal	C4	74,7	0	74,7	138	0	138
Recovery potential	D	32,8	0	32,8	-6639	0	-6639
<b>Landfilling 100%</b>							
De-construction	C1	0,17	0	0,17	44,9	0	44,9
Transport	C2	0	0	0	31,5	0	31,5
Waste processing	C3	9,74	-7670	-7660	59,3	0	59,3
Disposal	C4	8,47	0	8,47	151	0	151
Recovery potential	D	0	0	0	0	0	0

Parameters describing resource use, secondary materials and fuels, and use of water		Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Net use of fresh water
		kg	MJ	MJ	m <sup>3</sup>
<b>Product stage</b>	A1–A3	0	0	0	0,199
<b>Reuse 100%</b>					
De-construction	C1	0	0	0	3,43E-03
Transport	C2	0	0	0	0
Waste processing	C3	0	0	0	2,34E-03
Disposal	C4	0	0	0	0
Re-use potential	D	458	0	0	-0,193
<b>Recycling 100%</b>					
De-construction	C1	0	0	0	3,43E-03
Transport	C2	0	0	0	0
Waste processing	C3	0	0	0	2,82E-02
Disposal	C4	0	0	0	0
Recycling potential	D	458	0	0	-0,137

<b>Incineration 100%</b>					
De-construction	C1	0	0	0	3,43E-03
Transport	C2	0	0	0	0
Waste processing	C3	0	0	0	2,82E-02
Disposal	C4	0	7670	0	0,249
Recovery potential	D	0	0	0	7,34E-02
<b>Landfilling 100%</b>					
De-construction	C1	0	0	0	3,43E-03
Transport	C2	0	0	0	0
Waste processing	C3	0	0	0	2,82E-02
Disposal	C4	0	0	0	1,26E-01
Recovery potential	D	0	0	0	0

## OTHER ENVIRONMENTAL INFORMATION

Waste information		Hazardous waste disposal	Non-hazardous waste disposal	Radioactive waste disposal
		kg	kg	kg
<b>Product stage</b>	A1–A3	5,02E-02	0,421	0
<b>Reuse 100%</b>				
De-construction	C1	0	0	0
Transport	C2	0	0	0
Waste processing	C3	0	0	0
Disposal	C4	0	0	0
Re-use potential	D	-5,02E-02	-0,421	0
<b>Recycling 100%</b>				
De-construction	C1	0	0	0
Transport	C2	0	0	0
Waste processing	C3	0	0	0
Disposal	C4	0	0	0
Recycling potential	D	-5,85E-02	-1,91E-02	0
<b>Incineration 100%</b>				
De-construction	C1	0	0	0
Transport	C2	0	0	0
Waste processing	C3	0	0	0
Disposal	C4	0	0	0
Recovery potential	D	0	0	0
<b>Landfilling 100%</b>				
De-construction	C1	0	0	0
Transport	C2	0	0	0
Waste processing	C3	0	0	0
Disposal	C4	0	458	0
Recovery potential	D	0	0	0

Other output flows		Components for re-use	Materials for recycling	Materials for energy recovery	Exported energy, heat	Exported energy, electricity
		kg	kg	kg	MJ	kWh
<b>Product stage</b>	A1–A3	0	0,292	0	0	0
<b>Reuse 100%</b>						
De-construction	C1	0	0	0	0	0
Transport	C2	0	0	0	0	0
Waste processing	C3	458	0	0	0	0
Disposal	C4	0	0	0	0	0
Re-use potential	D	-458	-0,292	0	0	0
<b>Recycling 100%</b>						
De-construction	C1	0	0	0	0	0
Transport	C2	0	0	0	0	0
Waste processing	C3	0	458	0	0	0
Disposal	C4	0	0	0	0	0
Recycling potential	D	0	-458	-1,12E-02	0	0
<b>Incineration 100%</b>						
De-construction	C1	0	0	0	0	0
Transport	C2	0	0	0	0	0
Waste processing	C3	0	0	458	0	0
Disposal	C4	0	0	0	5369	0
Recovery potential	D	0	0	-458	0	0
<b>Landfilling 100%</b>						
De-construction	C1	0	0	0	0	0
Transport	C2	0	0	0	0	0
Waste processing	C3	0	0	0	0	0
Disposal	C4	0	0	0	0	0
Recovery potential	D	0	0	0	0	0

## ADDITIONAL INFORMATION

Unit Parameter	Unit	Result
Product stage		
Origin of wood	Countries	Austria, Czech Republic, Finland, Germany, Hungary, Latvia, Norway, Russia, Slovakia, Slovenia, Sweden
Stored biogenic carbon in wood (EN 16449)	kg CO <sub>2</sub>	-727
Net calorific value of wood (MC 0%)	MJ/kg	19,04
Candidate List of Substances of Very High Concern (REACH)		The product does not contain SVHC substances

# References

## Standards

EN 15804:2012 + A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

EN 16485:2014 Round and sawn timber. Environmental product declarations. Product category rules for wood and wood-based products for use in construction

EN 16449:2014 Wood and wood-based products. Calculation of the biogenic carbon content of wood and conversion to carbon dioxide

EN 15942:2012 Sustainability of construction works - Environmental product declarations - Communication format business-to-business

ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.

ISO 14044:2006 Environmental management. Life Cycle Assessment. Requirements and guidelines.

## Tools and databases

Sulca 4.2 - Sustainability tool for Ecodesign, Footprints & LCA. VTT Technical Research Centre of Finland Ltd

Ecoinvent 3 database. <http://www.ecoinvent.org/>

Lipasto - a calculation system for traffic exhaust emissions and energy use in Finland. VTT Technical Research Centre of Finland Ltd. <http://lipasto.vtt.fi/en/index.htm>

## Product information and guidance on safe and effective installation, use and disposal of the product

<http://buildingandliving.storaenso.com/products-and-services/exterior-cladding-and-interior-paneling>  
<http://www.storaenso.com>

## Third party verifier

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Stora Enso practises and promotes economically, socially, and environmentally sustainable forest management. The two most significant forest certification systems recognised by Stora Enso are run by the Forest Stewardship Council (FSC®) and the Programme for the Endorsement of Forest Certification (PEFC™).

*FSC trademark nr. C125195*



Trees grow by absorbing carbon dioxide, and remove carbon from the atmosphere. They help to reverse the greenhouse effect. Net carbon sequestration in the forest for the average of all wood production in Europe amounts to -730 kg of biogenic carbon per 1 cubic metre of wood.



Wood is recyclable and is a good resource for new fibre based products or energy generation to substitute fossil energy. Collection schemes and actual recycling rates depend on national waste legislation, consumer behaviour, point of consumption, local collection system and infrastructure.