

Environmental product declaration

MOSO Bamboo Thermo (EN15804) (Cladding)

MOSO

Calculation number: EPD-NIBE-20210805-20974

Generation on: 14-03-2022

Issue date: 14-03-2022

Valid until: 14-03-2027

Status: verified

R<THiNK



1 General

1.1 COMPANY INFORMATION / DECLARATION OWNER



Manufacturer: MOSO

Production Location: Manufacturing plant CN

Address: Adam Smithweg 2, 1689 ZWZwaag

E-mail: info@moso.eu

Website: www.moso-bamboo.com

1.2 EPD INFORMATION

EPD for: MOSO Bamboo Thermo (EN15804) (Cladding)

Calculation number: EPD-NIBE-20210805-20974

Date of issue: 14-03-2022

End of validity: 14-03-2027

Version NIBE's EPD Application: v2.0

Version Environmental Profile database: v3.07 (2021-11-08)

PCR: EN15804+A2:2019

1 General

1.3 SCOPE OF DECLARATION

This is a cradle to grave with options EPD. The life cycle stages included are as shown below:

(X = included, MND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	MND	MND	MND	MND	X	X	X	X	X

The modules of the EN15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Installation process	Module C2 = Transport
Module B1 = Emissions during use stage	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Final Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the system boundaries
Module B4 = Replacement	

1.4 VERIFICATION OF THE DECLARATION

CEN standard EN 15804:2012 serves as the core PCR.

Independent verification of the declaration. according to EN ISO 14025:2010.

☐ Internal ☒ External

I hereby confirm that, following detailed examination as independent 3rd party verifier, I have not been able to trace any relevant deviations by the report concerning bamboo products by MOSO, and by its project report from the requirements outlined in the corresponding product category regulations based on the EN 15804:2019 and as PCR, the Dutch Assessment (Determination) Method version 1.0 July 2020, including the amendments Hereby the report meets also the standards given in ISO 14040/44 and ISO 21930.

A.K. Jeeninga is recognized by NMD as verifier.

1 General



Third party verifier: Anne Kees Jeeninga, Advieslab

2 Product

2.1 PRODUCT DESCRIPTION

MOSO® Bamboo Thermo goes through a unique Thermo-Density® process of heat treatment at 200°C followed by High Density® compression to enhance the hardness, dimensional stability, fire resistance and durability to a level superior to the best tropical hardwood species.

MOSO® Bamboo Thermo products consist for approx. 90 % of rough strips made from the giant bamboo species “Phyllostachus Pubescens (Edulis)” from China (diameter up to 15 cm, length up to 15 meters) and about 10% of glue (phenol formaldehyde), and is also available with FSC certificate on request.

Dimensions

Cladding: 1850 x 137/155/178/208 x 20 mm

Cladding: 1850 x 75/137 x 12/18 mm

Biological durability:

Class 1 (EN 350)

Hardness (Brinell)

> 9,5 kg / mm² (EN 1534)

Reaction to fire

Cladding: Class Bfl-s1 (EN 13501-1)

Cladding: Class B-s1-d0 (EN 13501-1)

Biogenic CO2

Density of material kg/m3 (u=12%)	ρ	1.150
glue content	%	12,2%
carbon content	%	50,24%
Bamboo without glue kg/m3	Pw	1.009
Density without 12% moisture content kg/m3	Pw x Vw*/1,12	901
kg carbon / m3	cf x Pw x Vw*/1,12	453

kg CO2 / m3	44/12	1.661,68
kg CO2 / m2	m2	31,84

Substances of very high concern

The product does not contain any substances listed in the “Candidate List of Substances” of Very High Concern (SVHC) for authorisation” exceeding 0.1% of the weight of the product.



2 Product

2.2 DESCRIPTION OF THE MANUFACTURING PROCESS

Production

Bamboo strips are crushed to open up the material for further processing and become bundles of bamboo fibres, called strands. During the subsequent thermal processing, the moisture content changes and the sugar content is removed from the material. Furthermore, this process changes the colour of the bamboo from white/yellow to deep/dark brown.

The thermally modified bamboo strands are then dipped into thermosetting resin. After drying, the strands are put into a mould and are then compressed under high temperature and pressure to cure the glue. The combination of compressing and thermally treating the bamboo strands (Thermo-Density® process) increases the density from 650-700 kg/m³ to approx. 1.150 kg/m³ and improves the hardness of the product significantly. At the same time, the dimensional stability of bamboo is improved by approximately 50% and the durability increases to the highest class possible (class 1 following EN 350), whereas because of the densification the product can reach the European fire class B without the use of fire retardants.

The output is a large panel, which is cut into smaller sections (boards or beams). These are then further processed and profiled to acquire the required shape. Waste created during this process is used in the factory to create energy / heat for the internal processes. As a

last step, depending on the customer's request, the boards can be prefinished. This optional step is not included in this LCA.

The final product is a very stable and durable board or beam for use in multiple outdoor applications, typically cladding and cladding but also for use in outdoor furniture.

Contruction

The product is installed with 7 seams of 6mm per m2. 7*6=42mm. This means 95,8% of the surface consists of bamboo.

Installation of the product is carried out in a similar way to traditional cladding.

Battens and fasteners are not included in this calculation due to lack of available information.

4 Results

4.1 DECLARED UNIT

Impact category	Unit	Total Amount
Acidification (AP)	mol H+ eqv.	1.76E-1
Global warming potential (GWP-total)	kg CO2 eqv.	2.37E+1
Global warming potential - Biogenic (GWP-b)	kg CO2 eqv.	-1.02E+0
Global warming potential - Fossil (GWP-f)	kg CO2 eqv.	2.47E+1
Global warming potential - Land use and land use change (GWP-luluc)	kg CO2 eqv.	7.98E-4
Ecotoxicity, freshwater (ETP-fw)	CTUe	7.93E+2
Particulate Matter (PM)	disease incidence	1.77E-6
Eutrophication marine (EP-m)	kg N eqv.	4.73E-2
Eutrophication, freshwater (EP-fw)	kg P eqv.	1.43E-4
Eutrophication, terrestrial (EP-T)	mol N eqv.	5.06E-1
Human toxicity, cancer (HTP-c)	CTUh	1.07E-7
Human toxicity, non-cancer (HTP-nc)	CTUh	4.05E-7
Ionising radiation, human health (IR)	kBq U235 eqv.	-4.99E-1
Land use (SQP)	Pt	8.20E+3
Ozone depletion (ODP)	kg CFC 11 eqv.	9.19E-7
Photochemical ozone formation - human health (POCP)	kg NMVOC eqv.	1.52E-1
Resource use, fossils (ADP-f)	MJ	1.91E+2
Resource use, minerals and metals (ADP-mm)	kg Sb-eqv.	3.57E-4
Water use (WDP)	m3 world eqv.	1.63E+1

4 Results

Parameter	Unit	Total Amount
renewable primary energy ex. raw materials	MJ	7.04E+0
renewable primary energy used as raw materials	MJ	3.79E+2
renewable primary energy total	MJ	3.86E+2
non-renewable primary energy ex. raw materials	MJ	1.26E+2
non-renewable primary energy used as raw materials	MJ	7.54E+1
non-renewable primary energy total	MJ	2.02E+2
use of secondary material	Kg	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0
use of net fresh water	M3	3.45E-1
hazardous waste disposed	Kg	2.34E-4
non hazardous waste disposed	Kg	6.08E+0
radioactive waste disposed	Kg	-1.78E-4
Components for re-use	Kg	0.00E+0
Materials for recycling	Kg	1.58E-3
Materials for energy recovery	Kg	0.00E+0
Exported Energy Thermic	MJ	-9.45E+1
Exported Energy Electric	MJ	-5.49E+1

4 Results

4.2 PRODUCT STAGE (A1 - 3)

- A1. raw material extraction and processing, processing of secondary material input (e.g. recycling processes)
- A2. transport to the manufacturer
- A3. manufacturing

Impact category	Unit	A1	A2	A3
Acidification (AP)	mol H+ eqv.	4.86E-2	3.29E-3	7.41E-2
Global warming potential (GWP-total)	kg CO2 eqv.	-2.28E+1	5.68E-1	1.48E+1
Global warming potential - Biogenic (GWP-b)	kg CO2 eqv.	-3.20E+1	2.62E-4	-7.27E-1
Global warming potential - Fossil (GWP-f)	kg CO2 eqv.	9.19E+0	5.68E-1	1.55E+1
Global warming potential - Land use and land use change (GWP-luluc)	kg CO2 eqv.	6.73E-3	2.08E-4	3.97E-3
Ecotoxicity, freshwater (ETP-fw)	CTUe	3.69E+2	7.64E+0	3.98E+2
Particulate Matter (PM)	disease incidence	5.00E-7	5.11E-8	9.46E-7
Eutrophication marine (EP-m)	kg N eqv.	1.14E-2	1.16E-3	1.64E-2
Eutrophication, freshwater (EP-fw)	kg P eqv.	3.60E-4	5.73E-6	3.63E-4
Eutrophication, terrestrial (EP-T)	mol N eqv.	1.16E-1	1.28E-2	1.78E-1
Human toxicity, cancer (HTP-c)	CTUh	5.99E-8	2.48E-10	2.71E-8
Human toxicity, non-cancer (HTP-nc)	CTUh	1.59E-7	8.35E-9	1.87E-7
Ionising radiation, human health (IR)	kBq U235 eqv.	2.38E-1	3.59E-2	1.37E-1
Land use (SQP)	Pt	5.83E+3	7.43E+0	1.97E+3
Ozone depletion (ODP)	kg CFC 11 eqv.	8.95E-7	1.25E-7	4.23E-7
Photochemical ozone formation - human health (POCP)	kg NMVOC eqv.	4.35E-2	3.65E-3	5.09E-2
Resource use, fossils (ADP-f)	MJ	1.86E+2	8.56E+0	1.55E+2
Resource use, minerals and metals (ADP-mm)	kg Sb-eqv.	1.68E-4	1.44E-5	9.35E-5
Water use (WDP)	m3 world eqv.	1.08E+1	3.06E-2	5.77E+0

4 Results

Parameter	Unit	A1	A2	A3
renewable primary energy ex. raw materials	MJ	8.46E+0	1.07E-1	1.86E+1
renewable primary energy used as raw materials	MJ	2.71E+2	0.00E+0	9.07E+1
renewable primary energy total	MJ	2.79E+2	1.07E-1	1.09E+2
non-renewable primary energy ex. raw materials	MJ	1.47E+2	9.09E+0	1.45E+2
non-renewable primary energy used as raw materials	MJ	5.31E+1	0.00E+0	1.88E+1
non-renewable primary energy total	MJ	2.00E+2	9.09E+0	1.64E+2
use of secondary material	Kg	0.00E+0	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of net fresh water	M3	2.72E-1	1.04E-3	1.44E-1
hazardous waste disposed	Kg	1.22E-4	2.17E-5	1.34E-4
non hazardous waste disposed	Kg	9.52E-1	5.43E-1	1.59E+0
radioactive waste disposed	Kg	2.18E-4	5.62E-5	1.38E-4
Components for re-use	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0	-2.68E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0	-1.55E+0

4 Results

4.3 CONSTRUCTION PROCESS STAGE (A4 - 5)

- A4. transport to the building site
- A5. installation into the building

Impact category	Unit	A4	A5
Acidification (AP)	mol H+ eqv.	6.99E-2	1.04E-2
Global warming potential (GWP-total)	kg CO2 eqv.	3.35E+0	1.85E+0
Global warming potential - Biogenic (GWP-b)	kg CO2 eqv.	-1.49E-3	-2.38E-2
Global warming potential - Fossil (GWP-f)	kg CO2 eqv.	3.35E+0	1.87E+0
Global warming potential - Land use and land use change (GWP-luluc)	kg CO2 eqv.	3.57E-3	7.63E-4
Ecotoxicity, freshwater (ETP-fw)	CTUe	3.85E+1	4.24E+1
Particulate Matter (PM)	disease incidence	1.93E-7	8.98E-8
Eutrophication marine (EP-m)	kg N eqv.	1.79E-2	2.56E-3
Eutrophication, freshwater (EP-fw)	kg P eqv.	2.87E-5	3.96E-5
Eutrophication, terrestrial (EP-T)	mol N eqv.	1.99E-1	2.78E-2
Human toxicity, cancer (HTP-c)	CTUh	2.70E-9	5.20E-9
Human toxicity, non-cancer (HTP-nc)	CTUh	3.99E-8	2.26E-8
Ionising radiation, human health (IR)	kBq U235 eqv.	1.91E-1	3.39E-2
Land use (SQP)	Pt	2.12E+1	3.92E+2
Ozone depletion (ODP)	kg CFC 11 eqv.	6.78E-7	1.17E-7
Photochemical ozone formation - human health (POCP)	kg NMVOC eqv.	5.35E-2	8.24E-3
Resource use, fossils (ADP-f)	MJ	4.55E+1	2.06E+1
Resource use, minerals and metals (ADP-mm)	kg Sb-eqv.	6.62E-5	1.79E-5
Water use (WDP)	m3 world eqv.	1.53E-1	8.49E-1

4 Results

Parameter	Unit	A4	A5
renewable primary energy ex. raw materials	MJ	5.64E-1	1.44E+0
renewable primary energy used as raw materials	MJ	0.00E+0	1.81E+1
renewable primary energy total	MJ	5.64E-1	1.95E+1
non-renewable primary energy ex. raw materials	MJ	4.84E+1	1.84E+1
non-renewable primary energy used as raw materials	MJ	0.00E+0	3.59E+0
non-renewable primary energy total	MJ	4.84E+1	2.20E+1
use of secondary material	Kg	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0
use of net fresh water	M3	5.01E-3	2.19E-2
hazardous waste disposed	Kg	8.15E-5	1.99E-5
non hazardous waste disposed	Kg	1.38E+0	3.17E-1
radioactive waste disposed	Kg	3.02E-4	4.02E-5
Components for re-use	Kg	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	1.58E-3
Materials for energy recovery	Kg	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0

4 Results

4.4 USE STAGE (B1 - 7)

- B1, use or application of the installed product
- B2, maintenance
- B3, repair
- B4, replacement (m.n.d.)
- B5, refurbishment (m.n.d.)
- B6, operational energy use (m.n.d.)
- B7, operational water use (m.n.d.)

Impact category	Unit	B1	B2	B3
Acidification (AP)	mol H+ eqv.	0.00E+0	0.00E+0	0.00E+0
Global warming potential (GWP-total)	kg CO2 eqv.	0.00E+0	0.00E+0	0.00E+0
Global warming potential - Biogenic (GWP-b)	kg CO2 eqv.	0.00E+0	0.00E+0	0.00E+0
Global warming potential - Fossil (GWP-f)	kg CO2 eqv.	0.00E+0	0.00E+0	0.00E+0
Global warming potential - Land use and land use change (GWP-luluc)	kg CO2 eqv.	0.00E+0	0.00E+0	0.00E+0
Ecotoxicity, freshwater (ETP-fw)	CTUe	0.00E+0	0.00E+0	0.00E+0
Particulate Matter (PM)	disease incidence	0.00E+0	0.00E+0	0.00E+0
Eutrophication marine (EP-m)	kg N eqv.	0.00E+0	0.00E+0	0.00E+0
Eutrophication, freshwater (EP-fw)	kg P eqv.	0.00E+0	0.00E+0	0.00E+0
Eutrophication, terrestrial (EP-T)	mol N eqv.	0.00E+0	0.00E+0	0.00E+0
Human toxicity, cancer (HTP-c)	CTUh	0.00E+0	0.00E+0	0.00E+0
Human toxicity, non-cancer (HTP-nc)	CTUh	0.00E+0	0.00E+0	0.00E+0
Ionising radiation, human health (IR)	kBq U235 eqv.	0.00E+0	0.00E+0	0.00E+0
Land use (SQP)	Pt	0.00E+0	0.00E+0	0.00E+0
Ozone depletion (ODP)	kg CFC 11 eqv.	0.00E+0	0.00E+0	0.00E+0
Photochemical ozone formation - human health (POCP)	kg NMVOC eqv.	0.00E+0	0.00E+0	0.00E+0
Resource use, fossils (ADP-f)	MJ	0.00E+0	0.00E+0	0.00E+0
Resource use, minerals and metals (ADP-mm)	kg Sb-equiv.	0.00E+0	0.00E+0	0.00E+0
Water use (WDP)	m3 world eqv.	0.00E+0	0.00E+0	0.00E+0

4 Results

Parameter	Unit	B1	B2	B3
renewable primary energy ex. raw materials	MJ	0.00E+0	0.00E+0	0.00E+0
renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0
renewable primary energy total	MJ	0.00E+0	0.00E+0	0.00E+0
non-renewable primary energy ex. raw materials	MJ	0.00E+0	0.00E+0	0.00E+0
non-renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0
non-renewable primary energy total	MJ	0.00E+0	0.00E+0	0.00E+0
use of secondary material	Kg	0.00E+0	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of net fresh water	M3	0.00E+0	0.00E+0	0.00E+0
hazardous waste disposed	Kg	0.00E+0	0.00E+0	0.00E+0
non hazardous waste disposed	Kg	0.00E+0	0.00E+0	0.00E+0
radioactive waste disposed	Kg	0.00E+0	0.00E+0	0.00E+0
Components for re-use	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0	0.00E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0	0.00E+0

4 Results

4.5 END OF LIFE STAGE (C1 - 4)

- C1. de-construction. Demolition (m.n.d.)
- C2. transport to waste processing
- C3. waste processing for reuse. recovery and/or recycling (m.n.d.)
- C4. disposal

Impact category	Unit	C1	C2	C3	C4
Acidification (AP)	mol H+ eqv.	0.00E+0	2.55E-3	6.28E-3	8.36E-5
Global warming potential (GWP-total)	kg CO2 eqv.	0.00E+0	4.40E-1	3.66E+1	1.70E+0
Global warming potential - Biogenic (GWP-b)	kg CO2 eqv.	0.00E+0	2.03E-4	3.02E+1	1.67E+0
Global warming potential - Fossil (GWP-f)	kg CO2 eqv.	0.00E+0	4.39E-1	6.37E+0	2.40E-2
Global warming potential - Land use and land use change (GWP-luluc)	kg CO2 eqv.	0.00E+0	1.61E-4	5.46E-5	2.67E-6
Ecotoxicity, freshwater (ETP-fw)	CTUe	0.00E+0	5.91E+0	5.82E+0	2.07E-1
Particulate Matter (PM)	disease incidence	0.00E+0	3.95E-8	5.06E-8	1.74E-9
Eutrophication marine (EP-m)	kg N eqv.	0.00E+0	8.98E-4	2.91E-3	5.83E-5
Eutrophication, freshwater (EP-fw)	kg P eqv.	0.00E+0	4.43E-6	3.98E-6	1.49E-7
Eutrophication, terrestrial (EP-T)	mol N eqv.	0.00E+0	9.90E-3	3.33E-2	3.37E-4
Human toxicity, cancer (HTP-c)	CTUh	0.00E+0	1.92E-10	1.34E-8	7.02E-12
Human toxicity, non-cancer (HTP-nc)	CTUh	0.00E+0	6.46E-9	4.14E-8	2.39E-10
Ionising radiation, human health (IR)	kBq U235 eqv.	0.00E+0	2.78E-2	5.34E-3	1.15E-3
Land use (SQP)	Pt	0.00E+0	5.75E+0	7.55E-1	6.43E-1
Ozone depletion (ODP)	kg CFC 11 eqv.	0.00E+0	9.70E-8	2.64E-8	3.45E-9
Photochemical ozone formation - human health (POCP)	kg NMVOC eqv.	0.00E+0	2.83E-3	8.67E-3	1.22E-4
Resource use, fossils (ADP-f)	MJ	0.00E+0	6.63E+0	2.20E+0	2.53E-1
Resource use, minerals and metals (ADP-mm)	kg Sb-eqv.	0.00E+0	1.11E-5	1.46E-6	8.72E-8
Water use (WDP)	m3 world eqv.	0.00E+0	2.37E-2	3.31E-2	2.45E-3

4 Results

Parameter	Unit	C1	C2	C3	C4
renewable primary energy ex. raw materials	MJ	0.00E+0	8.30E-2	8.92E-2	9.22E-3
renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
renewable primary energy total	MJ	0.00E+0	8.30E-2	8.92E-2	9.22E-3
non-renewable primary energy ex. raw materials	MJ	0.00E+0	7.03E+0	2.37E+0	2.69E-1
non-renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
non-renewable primary energy total	MJ	0.00E+0	7.03E+0	2.37E+0	2.69E-1
use of secondary material	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
use of net fresh water	M3	0.00E+0	8.07E-4	9.40E-3	3.07E-4
hazardous waste disposed	Kg	0.00E+0	1.68E-5	1.33E-5	3.19E-7
non hazardous waste disposed	Kg	0.00E+0	4.20E-1	2.24E-1	1.10E+0
radioactive waste disposed	Kg	0.00E+0	4.35E-5	6.53E-6	1.64E-6
Components for re-use	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0

4 Results

End - of - life

Processes	Unit / functional unit
Recovery system	0.00 kg for re - use
	0.00 kg for recycling
	0.00 kg for energy recovery
Disposal	0.00 kg of materials used in the product

4.6 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Impact category	Unit	D
Acidification (AP)	mol H+ eqv.	-3.95E-2
Global warming potential (GWP-total)	kg CO2 eqv.	-1.29E+1
Global warming potential - Biogenic (GWP-b)	kg CO2 eqv.	-1.65E-1
Global warming potential - Fossil (GWP-f)	kg CO2 eqv.	-1.27E+1
Global warming potential - Land use and land use change (GWP-luluc)	kg CO2 eqv.	-1.47E-2
Ecotoxicity, freshwater (ETP-fw)	CTUe	-7.50E+1
Particulate Matter (PM)	disease incidence	-1.03E-7
Eutrophication marine (EP-m)	kg N eqv.	-5.96E-3
Eutrophication, freshwater (EP-fw)	kg P eqv.	-6.63E-4
Eutrophication, terrestrial (EP-T)	mol N eqv.	-7.16E-2
Human toxicity, cancer (HTP-c)	CTUh	-1.99E-9
Human toxicity, non-cancer (HTP-nc)	CTUh	-5.99E-8
Ionising radiation, human health (IR)	kBq U235 eqv.	-1.17E+0
Land use (SQP)	Pt	-3.22E+1
Ozone depletion (ODP)	kg CFC 11 eqv.	-1.45E-6
Photochemical ozone formation - human health (POCP)	kg NMVOC eqv.	-1.95E-2
Resource use, fossils (ADP-f)	MJ	-2.34E+2
Resource use, minerals and metals (ADP-mm)	kg Sb-eqv.	-1.55E-5
Water use (WDP)	m3 world eqv.	-1.42E+0

4 Results

Parameter	Unit	D
renewable primary energy ex. raw materials	MJ	-2.24E+1
renewable primary energy used as raw materials	MJ	-3.82E-1
renewable primary energy total	MJ	-2.27E+1
non-renewable primary energy ex. raw materials	MJ	-2.51E+2
non-renewable primary energy used as raw materials	MJ	-3.97E-2
non-renewable primary energy total	MJ	-2.51E+2
use of secondary material	Kg	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0
use of net fresh water	M3	-1.09E-1
hazardous waste disposed	Kg	-1.76E-4
non hazardous waste disposed	Kg	-4.49E-1
radioactive waste disposed	Kg	-9.84E-4
Components for re-use	Kg	0.00E+0
Materials for recycling	Kg	0.00E+0
Materials for energy recovery	Kg	0.00E+0
Exported Energy Thermic	MJ	-9.19E+1
Exported Energy Electric	MJ	-5.33E+1