

Result summary

Ecoboard/Eco-boards

ECOBOARD INTERNATIONAL BV

Calculation number:	EPD-NIBE-20220128-24452
Generation on:	13-04-2022
Issue date:	13-04-2022
Valid until:	13-04-2027
Status:	verified

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1 Ecoboard/Eco-boards

1.1 COMPANY INFORMATION / DECLARATION OWNER

Manufacturer: ECOBOARD INTERNATIONAL BV

Production Location: WANHUA ECOBOARD

Address: No. 19, Road 14, Xinyang Industrial Park, 464000Xinyang City, Henan province

E-mail: info@ecoboardinternational.com

Website: www.ecoboardinternational.com

1.2 EPD INFORMATION

Calculation number: EPD-NIBE-20220128-24452

Date of issue: 13-04-2022

End of validity: 13-04-2027

Version NIBE's EPD Application: v2.0

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

PCR: NMD Determination method Environmental performance Construction works v1.0
July 2020 incl. amendment oct '20 + feb '21 + okt '21 & EN15804+A2

1.3 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

In maart/april 2022 heb ik bovenstaande LCA dossier gereviewed. Hierbij bevestig ik dat, na gedetailleerd onderzoek als onafhankelijke verificateur, ik geen relevante afwijkingen in

de LCA en het projectrapport heb kunnen traceren. De methodologie en dataverzameling zoals beschreven in het rapport voldoen aan de eisen van de "NMD Bepalingsmethode bouwwerken versie 1.0 (juli 2020)" en de daaronder liggende normen ISO 14040, ISO 14044 en NEN-EN 15804. De bedrijfsspecifieke gegevens zijn onderzocht op plausibiliteit en consistentie; de eigenaar van de verklaring is verantwoordelijk voor de feitelijke integriteit ervan.



Third party verifier: Kamiel Jansen, Review by Primum

1.4 DECLARED UNIT

m²

One square meter of construction board (thickness 18mm) for indoor application, excluding fasteners and finishes

1 Ecoboard/Eco-boards

1.5 SCOPE OF DECLARATION

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

(X = included, MND = module not declared)

1 Ecoboard/Eco-boards

1.6 PRODUCT DESCRIPTION

Ecoboard is used as construction board for indoor application. The board material has a thickness of 18mm. The LCA does not consider fastening materials or finishes.

The chipboard-like material is made from recycled wheat straw fiber and wood fibers from natural waste streams or from fast-growing crops, glued with max. 5% methylene diphenyl diisocyanate (MDI).

The product has a density 650-680 kg/m³ and the thickness ranges from 9 to 25 mm. This calculation is based on board material with the measurements 1220*2440*18mm, calculated back to 1m².

The board material is manufactured in China.

1.7 DESCRIPTION OF THE MANUFACTURING PROCESS

The product is made in China and consists largely of wheat straw (75-80%) and wood chips (15-20%) and is bound with max. 5% MDI. The straw is produced or harvested within a radius of approximately 100-150 km from the factory in China - 125km is assumed to be a representative average. The wood chips are harvested within a radius of approximately 300-400 km from the factory in China - 350km is assumed to be a representative average.

The MDI comes from several plants within a radius of approximately 600-800km - 700km is assumed to be a representative average.

Biomass

For straw, sowing, fertilising, harvesting and cutting are included in the EcoInvent process. The straw is dried and shredded (further) before being incorporated into the plate with glue.

The wood chips are shredded, stripped of twigs, freed of cracks and dried, before being incorporated into the board with glue.

The biomass comes within a radius of about 125 km (straw) to 350 km (wood) from the factory in China, from farmers and forests in the area.

Production board material

The raw material is cleaned, chopped and fiberized then dried to 12% moisture content.

The biomass is mixed with MDI, the adhesive component, in a resination chamber. The mixture is spread as a mat and pressed with a hot press. The plates are removed from the hot press to cool and harden.

When the board material is cooled, they are custom-made and packaged and are ready for transport.

Transport

Transport to the Netherlands takes place via sea container on freighter, for the purpose of this LCA it has been assumed that sea transport always takes place via the Suez Canal. Transport from the factory in Dongbao District to Wuhan port by lorry is also taken into account.

1 Ecoboard/Eco-boards

1.8 RESULTS

Environmental effects	Unit	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
ADPE	Kg Sb	2.71E-4	8.72E-6	3.51E-5	6.55E-5	4.64E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.85E-6	6.32E-7	6.58E-8	-1.15E-5	4.22E-4
ADPF	Kg Sb	3.84E-2	2.51E-3	1.74E-2	2.78E-2	1.06E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.68E-3	5.52E-4	7.06E-5	-5.11E-3	9.40E-2
GWP	Kg CO2 Equiv.	4.40E+0	3.41E-1	2.71E+0	4.16E+0	1.44E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.29E-1	9.94E-2	4.38E-2	-8.60E-1	1.26E+1
ODP	Kg CFC-11 Equiv.	7.64E-7	6.05E-8	5.00E-8	6.99E-7	1.95E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.06E-8	1.18E-8	1.52E-9	-2.27E-7	1.60E-6
POCP	Kg Ethene Equiv.	5.52E-3	2.06E-4	8.37E-4	4.15E-3	1.36E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.38E-4	4.49E-4	1.37E-5	-2.71E-3	9.96E-3
AP	Kg SO2 Equiv.	2.39E-2	1.50E-3	1.38E-2	6.73E-2	1.32E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.01E-3	2.34E-3	4.05E-5	-1.64E-2	1.07E-1
EP	Kg PO43- Equiv.	6.02E-3	2.95E-4	1.56E-3	8.11E-3	2.01E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.98E-4	6.07E-4	1.66E-5	-5.36E-3	1.35E-2
HTP	kg 1.4 DB	2.56E+0	1.44E-1	1.43E+0	2.07E+0	7.89E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.63E-2	2.81E-1	3.79E-3	-1.45E+0	5.92E+0
FAETP	kg 1.4 DB	6.93E-2	4.19E-3	1.38E-2	4.40E-2	1.76E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.81E-3	1.24E-2	7.45E-5	-2.86E-2	1.36E-1
MAETP	kg 1.4 DB	1.50E+2	1.51E+1	8.70E+1	1.82E+2	5.41E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.01E+1	6.80E+0	2.69E-1	-3.88E+1	4.66E+2
TETP	kg 1.4 DB	1.03E-2	5.08E-4	1.19E-2	6.53E-3	3.57E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.40E-4	2.82E-4	1.23E-5	-4.62E-3	2.87E-2
AP	mol H+ eqv.	3.03E-2	2.00E-3	1.70E-2	8.49E-2	1.67E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.34E-3	3.46E-3	5.33E-5	-2.57E-2	1.30E-1
GWP-total	kg CO2 eqv.	-1.25E+0	3.44E-1	2.76E+0	4.19E+0	2.69E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.31E-1	1.61E+1	6.46E-2	-9.67E-1	2.41E+1
GWP-b	kg CO2 eqv.	-5.80E+0	1.59E-4	-4.88E-2	2.00E-4	1.22E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.07E-4	1.60E+1	5.78E-2	-7.88E-2	1.13E+1
GWP-f	kg CO2 eqv.	4.55E+0	3.44E-1	2.80E+0	4.19E+0	1.47E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.31E-1	1.01E-1	6.89E-3	-8.80E-1	1.28E+1
GWP-luluc	kg CO2 eqv.	5.05E-3	1.26E-4	5.04E-4	2.27E-3	9.64E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.46E-5	2.76E-5	3.01E-6	-8.87E-3	1.57E-4
ETP-fw	CTUe	2.95E+2	4.63E+0	7.59E+1	4.45E+1	5.10E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.10E+0	3.00E+0	1.46E-1	-2.49E+2	2.29E+2

1 Ecoboard/Eco-boards

PM	disease incidence	2.32E-7	3.10E-8	2.31E-7	2.42E-7	9.41E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.08E-8	2.79E-8	1.01E-9	-3.49E-7	5.30E-7
EP-m	kg N eqv.	9.12E-3	7.03E-4	3.78E-3	2.20E-2	4.53E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.72E-4	1.60E-3	3.44E-5	-7.47E-3	3.48E-2
EP-fw	kg P eqv.	1.80E-4	3.47E-6	6.55E-5	2.87E-5	3.38E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.33E-6	2.07E-6	1.28E-7	-8.34E-5	2.32E-4
EP-T	mol N eqv.	6.69E-2	7.75E-3	4.22E-2	2.45E-1	4.62E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.20E-3	1.84E-2	1.97E-4	-1.22E-1	3.09E-1
HTP-c	CTUh	6.33E-8	1.50E-10	2.23E-9	2.12E-9	1.33E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.01E-10	4.27E-8	4.05E-12	-2.91E-9	1.21E-7
HTP-nc	CTUh	5.68E-7	5.06E-9	4.64E-8	4.32E-8	8.11E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.39E-9	1.05E-8	1.56E-10	-8.57E-8	6.72E-7
IR	kBq U235 eqv.	1.34E-1	2.17E-2	2.59E-2	2.46E-1	5.34E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.46E-2	2.67E-3	5.69E-4	-3.77E-2	4.60E-1
SQP	Pt	2.33E+2	4.50E+0	1.60E+1	2.90E+1	3.38E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.02E+0	3.56E-1	3.44E-1	-9.64E+2	-6.44E+2
ODP	kg CFC 11 eqv.	7.86E-7	7.59E-8	5.37E-8	8.79E-7	2.23E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.09E-8	1.30E-8	1.90E-9	-2.30E-7	1.85E-6
POCP	kg NMVOC eqv.	2.07E-2	2.21E-3	1.11E-2	6.45E-2	1.26E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.48E-3	4.81E-3	7.04E-5	-2.19E-2	9.56E-2
ADP-f	MJ	7.05E+1	5.19E+0	2.58E+1	5.79E+1	1.97E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.48E+0	1.03E+0	1.45E-1	-1.01E+1	1.74E+2
ADP-mm	kg Sb-eqv.	2.71E-4	8.72E-6	3.51E-5	6.55E-5	4.64E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.85E-6	6.32E-7	6.58E-8	-1.15E-5	4.21E-4
WDP	m3 world eqv.	5.66E+0	1.86E-2	3.50E-1	1.46E-1	7.47E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.25E-2	3.61E-2	6.23E-3	-1.01E-1	6.87E+0

ADPE=Depletion of abiotic resources-elements | **ADPF**=Depletion of abiotic resources-fossil fuels | **GWP**=Global warming | **ODP**=Ozone layer depletion | **POCP**=Photochemical oxidants creation | **AP**=Acidification of soil and water | **EP**=Eutrophication | **HTP**=Human toxicity | **FAETP**=Ecotoxicity, fresh water | **MAETP**=Ecotoxicity, marine water (MAETP) | **TETP**=Ecotoxicity, terrestrial | **AP**=Acidification (AP) | **GWP-total**=Global warming potential (GWP-total) | **GWP-b**=Global warming potential - Biogenic (GWP-b) | **GWP-f**=Global warming potential - Fossil (GWP-f) | **GWP-luluc**=Global warming potential - Land use and land use change (GWP-luluc) | **ETP-fw**=Ecotoxicity, freshwater (ETP-fw) | **PM**=Particulate Matter (PM) | **EP-m**=Eutrophication marine (EP-m) | **EP-fw**=Eutrophication, freshwater (EP-fw) | **EP-T**=Eutrophication, terrestrial (EP-T) | **HTP-c**=Human toxicity, cancer (HTP-c) | **HTP-nc**=Human toxicity, non-cancer (HTP-nc) | **IR**=Ionising radiation, human health (IR) | **SQP**=Land use (SQP) | **ODP**=Ozone depletion (ODP) | **POCP**=Photochemical ozone formation - human health (POCP) | **ADP-f**=Resource use, fossils (ADP-f) | **ADP-mm**=Resource use, minerals and metals (ADP-mm) | **WDP**=Water use (WDP)

1 Ecoboard/Eco-boards

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
PERE	MJ	1.88E+1	6.50E-2	3.61E+0	5.58E-1	2.66E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.36E-2	4.75E-2	2.56E-3	-2.02E+2	-1.76E+2
PERM	MJ	4.78E+1	0.00E+0	2.58E-1	0.00E+0	5.77E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.39E+1
PERT	MJ	6.67E+1	6.50E-2	3.87E+0	5.58E-1	8.43E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.36E-2	4.75E-2	2.56E-3	-2.02E+2	-1.22E+2
PENRE	MJ	7.55E+1	5.51E+0	2.72E+1	6.15E+1	2.10E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.69E+0	1.11E+0	1.54E-1	-1.07E+1	1.85E+2
PENRM	MJ	1.54E+1	0.00E+0	8.34E-2	0.00E+0	1.86E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.74E+1
PENRT	MJ	9.09E+1	5.51E+0	2.73E+1	6.15E+1	2.28E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.69E+0	1.11E+0	1.54E-1	-1.07E+1	2.02E+2
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	M3	1.39E-1	6.32E-4	8.82E-3	5.04E-3	1.91E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.24E-4	5.39E-3	1.52E-4	-2.83E-3	1.76E-1
HWD	Kg	7.23E-5	1.32E-5	2.03E-5	9.99E-5	2.65E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.82E-6	6.58E-6	2.24E-7	-4.52E-5	2.03E-4
NHWD	Kg	3.90E-1	3.29E-1	3.74E-1	1.90E+0	4.68E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.21E-1	9.54E-2	5.81E-1	-3.71E-1	3.99E+0
RWD	Kg	1.35E-4	3.41E-5	2.78E-5	3.92E-4	7.38E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.29E-5	3.16E-6	8.64E-7	-5.96E-5	6.30E-4
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.56E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.56E-3
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.21E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.21E-2
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.11E+1	9.11E+1
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.76E+1	5.76E+1
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.35E+1	3.35E+1

PERE=renewable primary energy ex. raw materials | PERM=renewable primary energy used as raw materials | PERT=renewable primary energy total | PENRE=non-renewable primary energy ex. raw materials | PENRM=non-renewable primary energy used as raw materials | PENRT=non-renewable primary energy total | SM=use of secondary material | RSF=use of renewable secondary fuels | NRSF=use of non-renewable secondary fuels | FW=use of net fresh water | HWD=hazardous waste disposed | NHWD=non hazardous waste disposed | RWD=radioactive waste disposed | CRU=Components for re-use | MFR=Materials for recycling | MER=Materials for energy recovery | EE=Exported energy | EET=Exported Energy Thermic | EEE=Exported Energy Electric

1.9 ADDITIONAL INFORMATION

Allocation

There is no allocation applied for the environmental profiles / datasets used in this LCA.