MEDITE® SMARTPLY®
INNOVATIVE TIMBER PRODUCTS

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804 + A1
Owner of the Declaration – MEDITE SMARTPLY

SMARTPLY Oriented Strand Boards (OSB)

SMARTPLY MAX FR B (OSB/3)
SMARTPLY MAX (OSB/3)
SMARTPLY MAX T&G (OSB/3)
SMARTPLY ULTIMA (OSB/4)
SMARTPLY PATTRESS PLUS
SMARTPLY AIRTIGHT
SMARTPLY SITEPROTECT
SMARTPLY WEBSTOCK

Declaration number EPDIE-19-17
Issue date 11th November 2019
Valid to 11th November 2024

EPD Programme - EPD Ireland
Programme Operator - Irish Green Building Council
www.epdireland.org

1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council, 19 Mountjoy Square, Dublin D01 E8P5	SMARTPLY EUROPE DAC Belview, Slieverue, Waterford, Ireland Contact - David Murray (david.murray@mdfosb.com), www.mdfosb.com
DECLARATION NUMBER	**PRODUCTION SITE**
EPDIE-19-17	Belview, Slieverue, Waterford, Ireland
ECO PLATFORM	**DECLARED UNIT**
YES	1 tonne panel products
APPLICABLE PRODUCT CATEGORY RULES	**DECLARED PRODUCT**
EN 15804:2012+A1:2013, EPD Ireland PCR Part A (issued 29.06.2018), ISO 14040, ISO 14044, ISO 14025, I.S. EN 16485:2014 PCR for Wood and Wood-based Products in Construction.	SMARTPLY Oriented Strand Boards (OSB) The full list of OSB panel products comprises: SMARTPLY MAX FR B (OSB/3); SMARTPLY MAX (OSB/3); SMARTPLY MAX T&G (OSB/3); SMARTPLY ULTIMA (OSB/4); SMARTPLY PATTRESS PLUS; SMARTPLY AIRTIGHT; SMARTPLY SITEPROTECT; SMARTPLY WEBSTOCK.
DATE OF ISSUE	**SCOPE OF EPD**
11.11.2019	Manufacturer specific product
DATE OF EXPIRY	**LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA**
11.11.2024	EcoReview, Kilkenny, CO. Kilkenny, Ireland +353 87 258 9783 / +31 646 264 9327 info@ecoreview.ie / www.ecoreview.eu
REISSUE	**REISSUE DETAILS**
29.10.2021	1. Change in product names: SMARTPLY FLAME RETARDANT -> SMARTPLY MAX FR B (OSB/3) SMARTPLY OSB3 -> SMARTPLY MAX (OSB/3) SMARPLY OSB3 T&G -> SMARTPLY MAX T&G (OSB/3) 2. Removal of SMARTPLY OSB2 and SMARTPLY TOUGHPLY
30.01.2024	1. Change in product names: SMARTPLY PROPASSIV -> SMARTPLY AIRTIGHT
TYPE OF EPD: SINGLE OR MULTI PRODUCT	**LCA SOFTWARE AND DEVELOPER IF APPLICABLE**
Multi Product EPD	EcoChain software version 2.4.1
PRODUCT CLASSIFICATION OR NACE CODE	**NAME AND VERSION OF INVENTORY USED**
16.21 Manufacture of veneer sheets and wood-based panels	EcoInvent 3.4
COMPARABILITY	
Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+2012+A1:2013	
The CEN Norm /EN 15804 serves as the core PCR	
Independent verification of the declaration according to ISO 14025	

Internally ☐ Externally ×

SIGNATURE OF PROGRAMME OPERATOR	SIGNATURE VERIFIER
Pat Barry - CEO - Irish Green Building Council  IGBC IRISH GREEN BUILDING COUNCIL	Jane Anderson, ConstructionLCA Ltd 

2. Scope and Type of EPD

This is a Cradle to Gate EPD. The Modules that are declared are shown in the table below.

PRODUCT STAGE			CONSTRUCTION ON PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse – Recovery – Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X - Module declared.

MND - Module not declared.

3. Detailed product description

The LCA underlying this EPD is carried out for SMARTPLY Europe DAC. This EPD presents the results for SMARTPLY Oriented Strand Boards (OSB). The full list of OSB panel products comprises:

SMARTPLY MAX FR B (OSB/3);
SMARTPLY MAX (OSB/3);
SMARTPLY MAX T&G (OSB/3);
SMARTPLY ULTIMA (OSB/4);
SMARTPLY PATTRESS PLUS;
SMARTPLY AIRTIGHT;
SMARTPLY SITEPROTECT;
SMARTPLY WEBSTOCK;

All these panel products are all produced in the same way, with very minor variations in the compositions, and with two minor additional processes in the finishing phase of production.

The panels comprises cross oriented layers of strands of selected softwood timber bonded with synthetic resins and waxes. The panels are manufactured in accordance with the requirements of I.S. EN 300:2006 Oriented Strand Boards (OSB) – Definitions, classification and specifications.

The intended use of the SMARTPLY OSB panels is in the construction industry in structural and non-structural applications, such as flooring, roofing, walling, timber-frame sheathing, temporary works and external hoarding. The average density of the OSB3 panel is 600 kg/m^3.

The compositions are based on the Bills of Materials supplied by SMARTPLY for the OSB products manufactured in 2018. An example of the composition (based on the OSB3 product) per tonne of product is given in the table below.

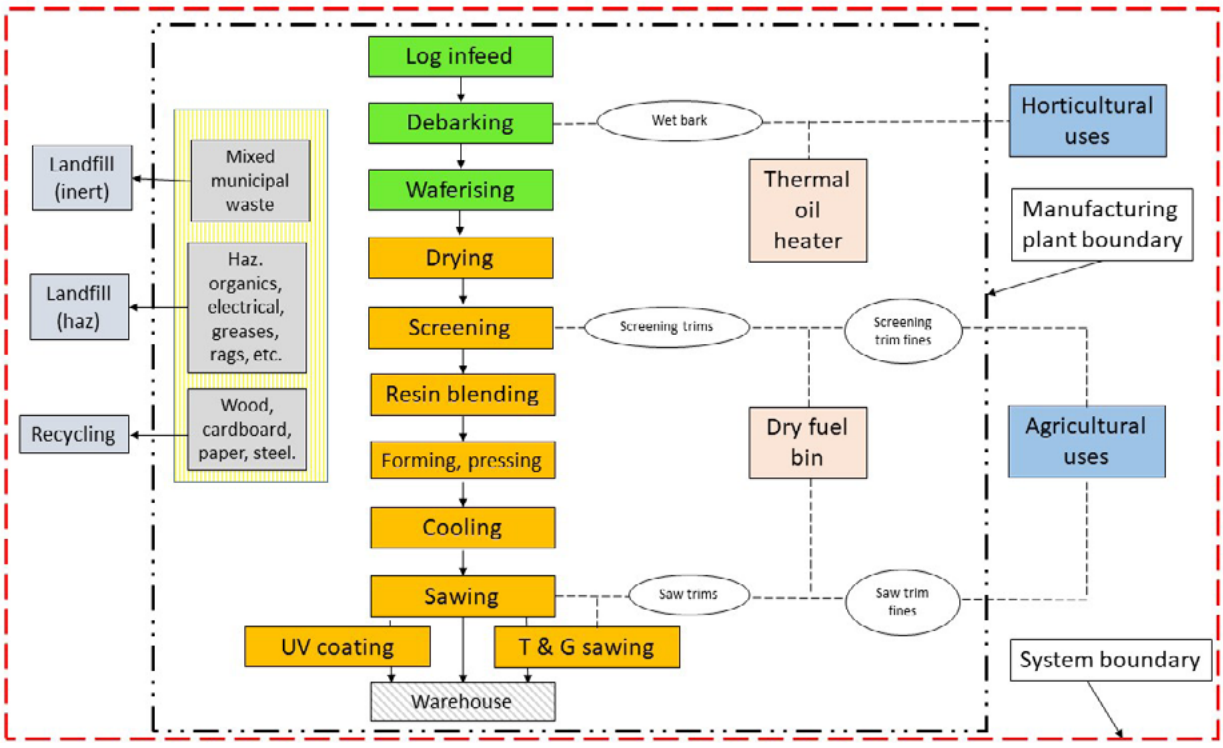
Constituent product	Weight (kg) per tonne of OSB3
Softwood pulp wood logs (at 0% moisture)	919.7
MDI	26.48
MPU	5.94
Wax (paraffin)	1.00
Release Agent	5.73
Moisture in finished product (ambient conditions)	41.15
Total	1000
Packaging	
Wood (Crafting and Battens)	2.01
Plastic strapping	0.28
Cardboard and paper (shrouds)	0.1

Materials used for packaging, such as cardboard, paper shrouds, wood for crating and battens, and strapping, are considered to be recycled after use.

3.1 Detailed process description

SMARTPLY OSB products are manufactured from small diameter pulpwood logs and forestry trimmings. Logs are fed into debarking drums to remove bark, and washed with water. Bark is used as a biomass fuel, and is also sold for horticulture. The cleaned logs are then cut into thin wafer strands (Flaking). The wet thin wafer strands are dried to a moisture content of 3-4% by four large driers (Drying). The dried strands are screened to remove fines, and then sprayed with a thermosetting resin and mixed with a small amount of wax, or other agents as required (Blending). The resin and wax-coated strands are then passed through a forming line where the strands are cross-oriented at 90 degrees in separate layers, and formed into a mat. The mat is trimmed to a pre-determined width, and is then passed into a rolling press to compress the layers of strands to a pre-determined thickness and density (Pressing). In 2015 the press used was WIW multi-daylight press, however this has since been upgraded in 2016 to a hot-rolled continuous press (ContiRoll®). After pressing, the mats are trimmed before they are air-cooled and then stacked before going into the Sawline for a final cut to specific sizes for various end-use applications. Following cutting, some panels go through two additional lines. These are: Tongue and Groove (T&G) cutting of edges to enable easy jointing in use; and a UV curable liquid coating line to impart enhanced durability, vapour control, or aesthetics. The finished panels are then stacked, strapped, packaged and labelled for onwards dispatch to the market.

All processes are accounted for in this analysis, and no processes are omitted. The processes are illustrated in the figure below.



A total of 37,885 tonnes of wet bark is generated by debarking. 12,262 (wet) tonnes of this goes to energy, used in the thermal oil heater. The balance of 25,624 (wet) tonnes goes to horticultural uses, as illustrated above. No impact is allocated to the bark in horticultural uses.

4.1 LCA results - SMARTPLY MAX FR B (OSB/3)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	2.41E+02	2.30E+01	1.22E+02	3.86E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.54E+03	0.00E+00	0.00E+00	-1.54E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.30E+03	2.30E+01	1.22E+02	-1.15E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	5.62E-06	4.24E-06	7.72E-06	1.76E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	1.12E+00	1.02E-01	4.21E-01	1.64E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	1.70E-01	1.85E-02	5.79E-02	2.46E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.40E-01	4.10E-03	1.91E-02	2.63E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	2.14E+00	1.70E-01	1.23E-01	2.44E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	4.72E+03	3.71E+02	1.93E+03	7.02E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.1 LCA results - SMARTPLY MAX FR B (OSB/3)

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	3.94E+02	4.89E+00	2.40E+02	6.39E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.56E+04	0.00E+00	0.00E+00	1.56E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.60E+04	4.89E+00	2.40E+02	1.62E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	2.70E+02	3.77E+02	1.84E+03	2.48E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	4.95E+03	0.00E+00	0.00E+00	4.95E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	5.22E+03	3.77E+02	1.84E+03	7.43E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	1.07E+00	2.05E-02	6.56E-01	1.75E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.1 LCA results - SMARTPLY MAX FR B (OSB/3)

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.09E-03	2.62E-03	9.82E-03	1.35E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.29E+01	2.16E+01	4.37E+00	3.88E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	1.70E-03	2.39E-03	9.50E-03	1.36E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.2 LCA results - SMARTPLY MAX (OSB/3)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	1.80E+02	2.17E+01	1.22E+02	3.24E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.68E+03	0.00E+00	0.00E+00	-1.68E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.50E+03	2.17E+01	1.22E+02	-1.36E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	4.11E-06	4.00E-06	7.72E-06	1.58E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	8.11E-01	9.61E-02	4.21E-01	1.33E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	1.40E-01	1.74E-02	5.79E-02	2.16E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.49E-01	3.85E-03	1.91E-02	2.72E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.57E+00	1.60E-01	1.23E-01	1.85E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	3.59E+03	3.50E+02	1.93E+03	5.87E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.2 LCA results - SMARTPLY MAX (OSB/3)

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	4.07E+02	4.61E+00	2.40E+02	6.52E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.70E+04	0.00E+00	0.00E+00	1.70E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.74E+04	4.61E+00	2.40E+02	1.77E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	2.21E+03	3.56E+02	1.84E+03	4.40E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	1.75E+03	0.00E+00	0.00E+00	1.75E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	3.96E+03	3.56E+02	1.84E+03	6.15E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	1.01E+00	1.94E-02	6.56E-01	1.68E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.2 LCA results - SMARTPLY MAX (OSB/3)

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.21E-03	2.47E-03	9.82E-03	1.35E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.19E+01	2.04E+01	4.37E+00	3.67E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	7.85E-04	2.26E-03	9.50E-03	1.25E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.3 LCA results - SMARTPLY MAX T&G (OSB/3)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	1.78E+02	2.15E+01	1.59E+02	3.58E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.66E+03	0.00E+00	0.00E+00	-1.66E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.48E+03	2.15E+01	1.59E+02	-1.30E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	4.09E-06	3.96E-06	9.24E-06	1.73E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	8.01E-01	9.51E-02	5.23E-01	1.42E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	1.39E-01	1.72E-02	6.81E-02	2.25E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.45E-01	3.81E-03	2.44E-02	2.74E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.55E+00	1.59E-01	1.23E-01	1.83E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	3.54E+03	3.46E+02	2.52E+03	6.41E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.3 LCA results - SMARTPLY MAX T&G (OSB/3)

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	6.12E+02	4.56E+00	3.22E+02	9.39E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.67E+04	0.00E+00	0.00E+00	1.67E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.73E+04	4.56E+00	3.22E+02	1.77E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	2.18E+03	3.52E+02	2.40E+03	4.93E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	1.73E+03	0.00E+00	0.00E+00	1.73E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	3.91E+03	3.52E+02	2.40E+03	6.66E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	1.02E+00	1.92E-02	7.89E-01	1.83E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.3 LCA results - SMARTPLY MAX T&G (OSB/3)

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.19E-03	2.44E-03	1.26E-02	1.63E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.31E+01	2.02E+01	5.85E+00	3.92E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	7.81E-04	2.23E-03	1.22E-02	1.53E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.4 LCA results - SMARTPLY ULTIMA (OSB/4)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	1.52E+02	2.19E+01	1.22E+02	2.95E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.73E+03	0.00E+00	0.00E+00	-1.73E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.58E+03	2.19E+01	1.22E+02	-1.43E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	3.87E-06	4.04E-06	7.72E-06	1.56E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	6.86E-01	9.62E-02	4.21E-01	1.20E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	1.24E-01	1.75E-02	5.79E-02	1.99E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.42E-01	3.86E-03	1.91E-02	2.65E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.23E+00	1.62E-01	1.23E-01	1.51E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	2.88E+03	3.54E+02	1.93E+03	5.16E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.4 LCA results - SMARTPLY ULTIMA (OSB/4)

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.79E+04	4.65E+00	2.40E+02	1.82E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.79E+04	4.65E+00	2.40E+02	1.82E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	3.19E+03	3.60E+02	1.84E+03	5.38E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	3.19E+03	3.60E+02	1.84E+03	5.38E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	8.89E-01	1.96E-02	6.56E-01	1.56E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.4 LCA results - SMARTPLY ULTIMA (OSB/4)

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	8.90E-04	2.50E-03	9.82E-03	1.32E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.05E+01	2.07E+01	4.37E+00	3.56E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	6.26E-04	2.28E-03	9.50E-03	1.24E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.5 LCA results - SMARTPLY PATTRESS PLUS

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	1.80E+02	2.17E+01	1.22E+02	3.24E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.70E+03	0.00E+00	0.00E+00	-1.70E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.52E+03	2.17E+01	1.22E+02	-1.38E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	4.11E-06	4.00E-06	7.72E-06	1.58E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	8.11E-01	9.61E-02	4.21E-01	1.33E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	1.40E-01	1.74E-02	5.79E-02	2.16E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.49E-01	3.85E-03	1.91E-02	2.72E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.57E+00	1.60E-01	1.23E-01	1.85E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	3.59E+03	3.50E+02	1.93E+03	5.87E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.5 LCA results - SMARTPLY PATTRESS PLUS

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	4.07E+02	4.61E+00	2.40E+02	6.52E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.70E+04	0.00E+00	0.00E+00	1.70E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.74E+04	4.61E+00	2.40E+02	1.77E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	2.21E+03	3.56E+02	1.84E+03	4.40E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	1.75E+03	0.00E+00	0.00E+00	1.75E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	3.96E+03	3.56E+02	1.84E+03	6.15E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	1.01E+00	1.94E-02	6.56E-01	1.68E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.5 LCA results - SMARTPLY PATTRESS PLUS

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.21E-03	2.47E-03	9.82E-03	1.35E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.19E+01	2.04E+01	4.37E+00	3.67E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	7.85E-04	2.26E-03	9.50E-03	1.25E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.6 LCA results - SMARTPLY AIRTIGHT

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	2.58E+02	2.16E+01	1.59E+02	4.39E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.64E+03	0.00E+00	0.00E+00	-1.64E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.38E+03	2.16E+01	1.59E+02	-1.20E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	4.85E-06	3.99E-06	9.26E-06	1.81E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	1.33E+00	9.61E-02	5.25E-01	1.95E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	2.29E-01	1.74E-02	6.83E-02	3.15E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.65E-01	3.85E-03	2.45E-02	2.93E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	2.13E+00	1.60E-01	1.23E-01	2.42E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	4.71E+03	3.49E+02	2.53E+03	7.59E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.6 LCA results - SMARTPLY AIRTIGHT

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	4.44E+02	4.60E+00	3.23E+02	7.71E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.72E+04	0.00E+00	0.00E+00	1.72E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.77E+04	4.60E+00	3.23E+02	1.80E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	3.05E+03	3.55E+02	2.40E+03	5.81E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	2.17E+03	0.00E+00	0.00E+00	2.17E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	5.22E+03	3.55E+02	2.40E+03	7.98E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	1.09E+00	1.93E-02	7.91E-01	1.90E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.6 LCA results - SMARTPLY AIRTIGHT

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	3.00E-01	2.46E-03	1.27E-02	3.15E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.66E+01	2.03E+01	5.87E+00	4.28E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	1.13E-03	2.25E-03	1.23E-02	1.57E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.7 LCA results - SMARTPLY SITEPROTECT

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	3.23E+02	2.20E+01	1.73E+02	5.18E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.64E+03	0.00E+00	0.00E+00	-1.64E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.31E+03	2.20E+01	1.73E+02	-1.12E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	5.07E-06	4.06E-06	9.82E-06	1.90E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	1.62E+00	9.86E-02	5.62E-01	2.28E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	2.53E-01	1.77E-02	7.20E-02	3.42E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.73E-01	3.94E-03	2.64E-02	3.04E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	2.91E+00	1.63E-01	1.23E-01	3.20E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	6.32E+03	3.55E+02	2.75E+03	9.42E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.7 LCA results - SMARTPLY SITEPROTECT

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	4.53E+02	4.69E+00	3.53E+02	8.10E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.65E+04	0.00E+00	0.00E+00	1.65E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.70E+04	4.69E+00	3.53E+02	1.73E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	4.11E+03	3.62E+02	2.61E+03	7.08E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	2.86E+03	0.00E+00	0.00E+00	2.86E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	6.97E+03	3.62E+02	2.61E+03	9.94E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	1.19E+00	1.97E-02	8.39E-01	2.05E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.7 LCA results - SMARTPLY SITEPROTECT

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	3.01E-01	2.51E-03	1.37E-02	3.17E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.82E+01	2.07E+01	6.40E+00	4.53E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	1.27E-03	2.29E-03	1.33E-02	1.68E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

4.8 LCA results - SMARTPLY WEBSTOCK

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO_2 -Eq.]	1.50E+02	2.17E+01	1.22E+02	2.93E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO_2 -Eq.]	-1.54E+03	0.00E+00	0.00E+00	-1.54E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO_2 -Eq.]	-1.39E+03	2.17E+01	1.22E+02	-1.25E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	4.11E-06	4.00E-06	7.72E-06	1.58E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO2-Eq.]	6.78E-01	9.59E-02	4.21E-01	1.19E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO4) -Eq.]	1.30E-01	1.74E-02	5.79E-02	2.06E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	2.48E-01	3.85E-03	1.91E-02	2.71E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.20E+00	1.60E-01	1.23E-01	1.48E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	2.82E+03	3.50E+02	1.93E+03	5.10E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWPf = Global warming potential fossil; GWPb = Global warming potential biogenic; GWPt = Global warming potential total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed.

4.8 LCA results - SMARTPLY WEBSTOCK

Resource use per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	8.30E+02	4.61E+00	2.40E+02	1.07E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	1.71E+04	0.00E+00	0.00E+00	1.71E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.79E+04	4.61E+00	2.40E+02	1.82E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	1.42E+03	3.56E+02	1.84E+03	3.61E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	1.72E+03	0.00E+00	0.00E+00	1.72E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	3.14E+03	3.56E+02	1.84E+03	5.33E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m^3]	9.79E-01	1.94E-02	6.56E-01	1.65E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed. MND = Module not declared.

SM, RFS and NRSF are not calculated by the EcoChain software.

4.8 LCA results - SMARTPLY WEBSTOCK

Output flows and waste categories per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.14E-03	2.47E-03	9.82E-03	1.34E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	1.13E+01	2.04E+01	4.37E+00	3.60E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	8.32E-04	2.26E-03	9.50E-03	1.26E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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; EEE = Exported electrical energy; EEE = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

5.1 LCA results - Additional Impact Indicators - SMARTPLY MAX FR B (OSB/3)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	4.34E+01	9.94E+00	2.78E+01	8.12E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.95E+01	3.29E-01	3.58E-01	2.02E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	3.00E+04	4.46E+03	2.89E+03	3.74E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.54E+00	5.26E-02	6.20E-01	8.22E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.2 LCA results - Additional Impact Indicators - SMARTPLY MAX (OSB/3)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	3.23E+01	9.38E+00	2.78E+01	6.95E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.76E+01	3.11E-01	3.58E-01	1.83E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	1.55E+04	4.21E+03	2.89E+03	2.26E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.28E+00	4.97E-02	6.20E-01	7.95E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.3 LCA results - Additional Impact Indicators - SMARTPLY MAX T&G (OSB/3)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	3.20E+01	9.28E+00	3.35E+01	7.48E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.76E+01	3.08E-01	4.36E-01	1.84E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	1.53E+04	4.17E+03	3.39E+03	2.29E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.27E+00	4.92E-02	8.35E-01	8.16E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.4 LCA results - Additional Impact Indicators - SMARTPLY ULTIMA (OSB/4)

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	2.83E+01	9.46E+00	2.78E+01	6.56E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.74E+01	3.15E-01	3.58E-01	1.81E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	1.16E+04	4.25E+03	2.89E+03	1.87E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.23E+00	5.02E-02	6.20E-01	7.90E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.5 LCA results - Additional Impact Indicators - SMARTPLY PATTRESS PLUS

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	3.23E+01	9.38E+00	2.78E+01	6.95E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.76E+01	3.11E-01	3.58E-01	1.83E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	1.55E+04	4.21E+03	2.89E+03	2.26E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.28E+00	4.97E-02	6.20E-01	7.95E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.6 LCA results - Additional Impact Indicators - SMARTPLY AIRTIGHT

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	3.64E+01	9.35E+00	3.36E+01	7.93E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.84E+01	3.10E-01	4.37E-01	1.92E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	2.41E+04	4.20E+03	3.40E+03	3.17E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.70E+00	4.95E-02	8.38E-01	8.59E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.7 LCA results - Additional Impact Indicators - SMARTPLY SITEPROTECT

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	4.21E+01	9.53E+00	3.57E+01	8.73E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.90E+01	3.16E-01	4.66E-01	1.98E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	2.96E+04	4.28E+03	3.58E+03	3.75E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.80E+00	5.05E-02	9.17E-01	8.77E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.8 LCA results - Additional Impact Indicators - SMARTPLY WEBSTOCK

Environmental impact per tonne

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	2.99E+01	9.37E+00	2.78E+01	6.71E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	1.74E+01	3.11E-01	3.58E-01	1.80E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	1.31E+04	4.21E+03	2.89E+03	2.02E+04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	7.23E+00	4.97E-02	6.20E-01	7.90E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

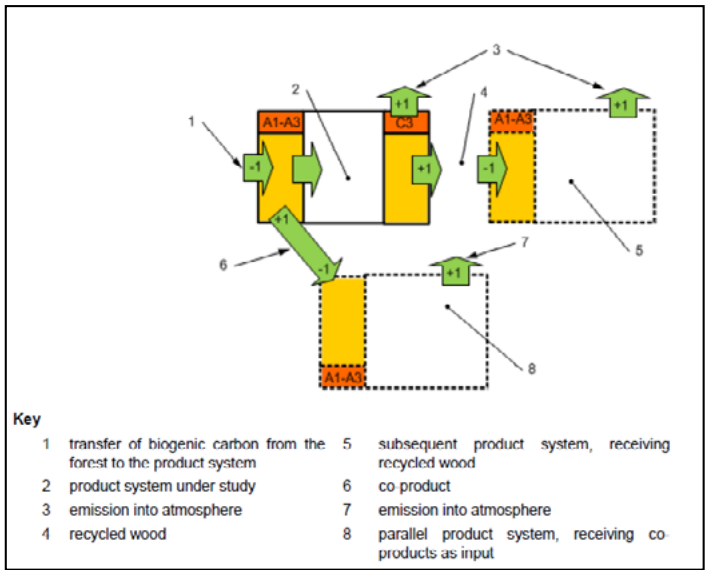
Note - MND - Module not declared INA - Indicator not assessed.

6. LCA Results - Additional LCI Indicators

The primary component of SMARTPLY products is wood, which as it grows sequesters atmospheric CO_2 .

For clarity in the EPD, the biogenic CO_2 is reported separately so that the biogenic CO_2 component can be incorporated into any end-of-life scenarios, where these are considered.

Biogenic CO_2 is calculated according to EN 16485:2014 Round and sawn timber – Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction and EN 16449:2014 Wood and wood-based products – Calculation of the biogenic carbon content of wood and conversion to carbon dioxide.



Key

1	transfer of biogenic carbon from the forest to the product system	5	subsequent product system, receiving recycled wood
2	product system under study	6	co-product
3	emission into atmosphere	7	emission into atmosphere
4	recycled wood	8	parallel product system, receiving co-products as input

The figure shows that if we assess the product system as a whole, (represented graphically by each full rectangle above, which includes the "+1" arrow, representing release at end-of-life), eventually this CO_2 will be released back into the atmosphere.

The formula used to calculate the biogenic CO_2 is given:

where $$P_{CO_2} = \frac{44}{12} \times cf \times \frac{\rho_\omega \times V_\omega}{1 + \frac{\omega}{100}}$$

P_{CO2} is the biogenic carbon oxidized as carbon dioxide emission from the product system into the atmosphere (e.g. energy use at the end-of-life) (kg);

cf is the carbon fraction of woody biomass (oven dry mass), 0,5 as the default value;

ω is the moisture content of the product (e.g. 12 (%));

ρ_ω is the density of woody biomass of the product at that moisture content (kg/m^3);

V_ω is the volume of the solid wood product at that moisture content (m^3).

For wood-based products, wood volume content V_ω = VP x percentage of wood.

VP is the gross volume of the wood-based product.

At the end of life (module C, Figure 2) the biogenic CO_2 will be released back into the atmosphere. Although this LCA covers modules A1 – A3 (cradle to factory gate), the release of the biogenic CO_2 at the end of life is also reported separately on the EPD certificate.

Table with input values used to calculate biogenic CO_2 per m^3 wood.

PARAMETER	VALUE	NOTES
cf, carbon fraction of woody biomass	0.5	As per EN 16449
ω, moisture content of wood	0%	
V_ω, volume of solid wood at above ω	1.0 m^3	Calculation is done per m^3
ρ_ω, density of wood	410 kg/m^3	Density of wood @ m.c. of 0% (figures supplied by MEDITE)

The wood types used in the OSB boards comprises 25% spruce and 75% pine. The oven-dry (at 0% moisture content) densities of these two woods are given by SMARTPLY as 380 and 420 kg/m^3 respectively (data supplied by SMARTPLY). Thus a density of 410 kg/m^3 is used in the biogenic calculation.

The biogenic CO_2 per m^3 of wood = (44/12) x 0.5 x (410 x 1.0)/(1 + (0/100)) = 751.67 kg per cubic metre (m^3). The wood density is 410 kg/m^3, thus biogenic CO_2 per kg wood = 751.67/410 = 1.83 kg CO_2 per kg. The biogenic CO_2 for the SMARTPLY products are presented in the table below.

PRODUCT	AVERAGE BOARD DENSITY kg/m^3	kg DRY WOOD PER TONNE OF OSB BOARD
SMARTPLY MAX FR B (OSB/3)	600	843.66
SMARTPLY MAX (OSB/3)	600	919.67
SMARTPLY MAX T&G (OSB/3)	600	905.34
SMARTPLY ULTIMA (OSB/4)	600	947.14
SMARTPLY PATTRESS PLUS	600	931.39
SMARTPLY AIRTIGHT	600	894.10
SMARTPLY SITEPROTECT	600	894.46
SMARTPLY WEBSTOCK	600	843.66

kg DRY WOOD PER TONNE OF OSB BOARD	kg DRY WOOD PER TONNE OF OSB BOARD
1,543.90	926.34
1,683.00	1,009.80
1,656.77	994.06
1,733.27	1,022.63
1,704.44	1,073.80
1,636.20	1,030.81
1,636.86	1,031.22
1,543.90	926.34

At the end of life (module C, Figure 2) the biogenic CO_2 will be released back into the atmosphere. Although this LCA covers modules A1 – A3 (cradle to factory gate), the release of the biogenic CO_2 at the end of life is also reported separately on the EPD certificate.

Table with input values used to calculate biogenic CO_2 per m^3 wood.

Parameter	Value	Notes
cf, carbon fraction of woody biomass	0.5	As per EN 16449
ω, moisture content of wood	0%	
V_ω, volume of solid wood at above ω	1.0 m^3	Calculation is done per m^3
ρ_ω, density of wood	410 kg/m^3	Density of wood @ m.c. of 0% (figures supplied by MEDITE)

The wood types used in the OSB boards comprises 25% spruce and 75% pine. The oven-dry (at 0% moisture content) densities of these two woods are given by SMARTPLY as 380 and 420 kg/m^3 respectively (data supplied by SMARTPLY). Thus a density of 410 kg/m^3 is used in the biogenic calculation.

The biogenic CO_2 per m^3 of wood = (44/12) x 0.5 x (410 x 1.0)/(1 + (0/100)) = 751.67 kg per cubic metre (m^3). The wood density is 410 kg/m^3, thus biogenic CO_2 per kg wood = 751.67/410 = 1.83 kg CO_2 per kg. The biogenic CO_2 for the SMARTPLY products are presented in the table below.

Product	Average board density kg/m^3	kg dry wood per tonne of OSB board	Kg biogenic CO_2 per tonne of OSB board	Kg biogenic CO_2 per m^3 of OSB board
SMARTPLY MAX FR B (OSB/3)	600	843.66	1,543.90	926.34
SMARTPLY MAX (OSB/3)	600	919.67	1,683.00	1,009.80
SMARTPLY MAX T&G (OSB/3)	600	905.34	1,656.77	994.06
SMARTPLY ULTIMA (OSB/4)	600	947.14	1,733.27	1,022.63
SMARTPLY PATTRESS PLUS	600	931.39	1,704.44	1,073.80
SMARTPLY AIRTIGHT	600	894.10	1,636.20	1,030.81
SMARTPLY SITEPROTECT	600	894.46	1,636.86	1,031.22
SMARTPLY WEBSTOCK	600	843.66	1,543.90	926.34

Taking into account the biogenic CO_2 , the resultant net CO_2 for the SMARTPLY products "at the factory gate", i.e. as they leave the production plant is given in the table below. This has been carried out so that the total GWP provided is calculated in accordance with EN 16485 and CEN/TR 16970.

Product	GWP from fossil sources per tonne for A1 - A3	Biogenic CO_2 per tonne	Net GWP per tonne for A1 - A3	A1 - A3 GWP per m^3	Biogenic CO_2 per m^3	Net GWP per m^3
SMARTPLY MAX FR B (OSB/3)	385.66	1,543.90	-1,158.24	231.40	926.34	-694.94
SMARTPLY MAX (OSB/3)	323.69	1,683.00	-1,359.31	194.22	1,009.80	-815.58
SMARTPLY MAX T&G (OSB/3)	358.50	1,656.77	-1,298.27	215.10	994.06	-778.96
SMARTPLY ULTIMA (OSB/4)	295.17	1,733.27	-1,438.10	174.15	1,022.63	-848.48
SMARTPLY PATTRESS PLUS	323.69	1,704.44	-1,380.75	194.22	1,073.80	-879.58
SMARTPLY AIRTIGHT	438.66	1,636.20	-1,197.54	276.36	1,030.81	-754.45
SMARTPLY SITEPROTECT	518.24	1,636.86	-1,118.62	326.49	1,031.22	-704.73
SMARTPLY WEBSTOCK	293.28	1,543.90	-1,250.62	193.57	926.34	-732.77

A2. Transport of raw materials to manufacturer

All relevant transport of materials to SMARTPLY's production plant has been included in this study. This includes the transport distance of the raw materials to the manufacturing facility via road, boat and/or train.

A3. Manufacturing

The production processes are modelled using specific values from primary data collection at the production site. All relevant production processes in module A3 are included in this assessment. All processes in the production of SMARTPLY products use electricity. There is no discrete sub-metering of electrical energy for the various individual processes, hence energy use across the different processes has been allocated based on estimates supplied by SMARTPLY.

Heat is required for two of the processes in the production of SMARTPLY products. These are the flake drying process and the pressing process. Both these processes use biomass fuel that originates at various stages of the manufacturing process. Of the biomass fuel, 35% is allocated to the pressing process and the remaining 65% is allocated to the flake drying process.

Some of the production scraps, i.e. trims, that are used as biomass, also contain MDI, wax and resin, which has been added during the blending stage. The weight of the MDI, wax and resin is accounted for and the weight of the biomass is adjusted accordingly, net of the weight of the MDI, wax and resin. These values presented in rows 6 and 7 in Table 5b, section 4.2.2. This weight of MDI, wax and resin is included as a fuel, as diesel as a proxy in the fuel burning.

In this analysis an equivalent weight of diesel fuel is used as a proxy for the weight of MDI, wax and resin in the biomass that is burnt in the burners.

Diesel was selected as a proxy for the MDI, wax and resin, because the calculated CO_2 emissions from the burning of MDI, wax and resin – based on the assumption that all the carbon in the MDI, wax and resin (determined from molecular weight calculations of their chemical constituents) combines with oxygen in their burning to form CO_2 – is slightly less (approximately 10%) than the CO_2 of burning diesel.

The production site does not have any dangerous waste streams. All other substances and emissions that are released during the production process are included in this assessment.

9. Mandatory additional information on release of dangerous substances to indoor air, soil and water

None of the substances contained in the product are listed in the "Candidate List of Substances of Very High Concern for authorisation", or they do not exceed the threshold with the European Chemicals Agency.

10. Other optional additional environmental information

It is not determined as to how the OSB panels are to be processed at the end of life (after 50 years). Therefore this module is not considered in this LCA study. As new and improved systems for the recycling of building products are developed over time, these can be determined and then applied to a future LCA study.

11. References

EPD Ireland Product Category Rules: PART A Implementation and use of IS 15804:2012 and CEN TR 16970 in Ireland for the development of Environmental Product Declarations,29.06.2018 -www.epdireland.org

[1] ISO 14040: Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO14040:2006.

[2] ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006.

[3] ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO14025:2006.

[4] I.S. EN 15804:2012+A1:2013,: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', EN 15804:2012+A1:2013.

[5] EcoChain, 2017, web: http://app.ecochain.com.

[6] Product Category Rules : Part A Implementation and use of I.S. EN 15804:2012 and CEN TR 16970:2016 in Ireland.
https://www.igbc.ie/wp-content/uploads/2017/07/Product-Category-Rules-Part-A_July_2017.pdf

[7] CML - Department of Industrial Ecology, CML-IA Characterisation Factors, Dated August 2016, Leiden University, Leiden, Netherlands Available at: https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors

[8] Ministerie van Verkeer en Waterstaat, 8 maart 2004, Toxiciteit heeft z'n prijs, Schaduwprijzen voor (eco-) toxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc.

[9] I.S. EN 16485:2014 Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction.