Particleboards and Thermofused Laminated Panels(TFL)

Uniboard®

ENVIRONMENTAL PRODUCT DECLARATION

ISO 14025:2006

Uniboard is pleased to present this Environmental Product Declaration (EPD) for their Particleboards and Thermofused Laminated Panels. This EPD was developed in compliance with ISO 14025 and has been verified by Jean-François Menard, B. Sc., B. Eng. CIRAIG.

The LCA and the EPD were prepared by Vertima Inc. The EPD includes cradle-to-gate life cycle assessment (LCA) results.

For more information about Uniboard, visit https://www.uniboard.com.

For any explanatory material regarding this EPD, please contact the program operator.

Environmental Product Declaration

CSA Group Registered Based on ISO 14025 and Other Requirements
For more information visit csaregistries.ca/epd

8861-2536
December 2023-December 2028

1. GENERAL INFORMATION

PCR GENERAL INFORMATION			
Reference PCR	Product Category Rule (PCR) Guidance for Building-Related Products and Services in Part B: Structural and Architectural Wood Products EPD Requirements. Version 1.0. UL Environment, October 2019 to October 2024		
The PCR review was conducted by:	*Dr. Thomas Gloria (Chair)* *t.gloria@industrial-ecology.com* *Industrial Ecology Consultants*	*Dr. Indro Ganguly* *University of Washington*	*Dr. Sahoo* *University of Georgia*

EPD GENERAL INFORMATION		
Program Operator	CSA Group 178 Rexdale Blvd. Toronto (ON) M9W 1R3 Canada www.csagroup.org	
Declared Product	**Particleboards and Thermofused Laminated Panels**	
EPD Registration Number 8861-2536	**EPD Date of Issue** December 13, 2023	**EPD Period of Validity** December 13, 2023 - December 11, 2028
EPD Recipient Organization	UNIBOARD 5555 Ernest-Cormier Street, Suite 100 Laval, QC H7C 2S9 Canada https://www.uniboard.com	

EPD Type/Scope and Declared Unit			**Year of Reported Manufacturer Primary Data**
Product-specific cradle-to-gate EPD with a declared unit of 1m^3 of particleboard and thermofused laminated panels.			October 2021 – September 2022
Geographical Scope North America	**LCA Software** OpenLCA v.1.10.3	**LCI Databases** Ecoinvent 3.7 and US LCI	**LCIA Methodology** TRACI 2.1 - IPCC 2013

This LCA and EPD were prepared by:	Gatien Geraud Essoua Essoua Ph.D., Forestry Eng. Vertima Inc. www.vertima.ca
This EPD and LCA were independently verified in accordance with ISO 14025:2006 and ISO 14040:2006, as well as the UL Environment PCR "PCR for Building-Related Products and Services in Part B: Structural and Architectural Wood Products EPD Requirements. Version 1.0," which is based on ISO 21930:2017. ☐ Internal ☒ External	Jean-François Ménard CIRAIG

LIMITATIONS

Environmental declarations from different programs (ISO 14025) may not be comparable[1].

Comparison of the environmental performance using EPD information shall consider all relevant information modules over the full life cycle of the products within the building.

This PCR allows EPD comparability only when the same functional requirements between products are ensured and the requirements of ISO 21930:2017 §5.5 are met. It should be noted that different LCA software and background LCI datasets may lead to differences in results upstream or downstream of the life cycle stages declared.

2. PRODUCT SYSTEM DESCRIPTION

Uniboard® has firmly established itself as a leader in the North American thermofused laminated panel (TFL) and particleboard industry. Uniboard® conforms to the most stringent environmental standards. Wood fibers used by Uniboard® in its panel manufacturing process come mainly from sawmills. Uniboard® holds the Forest Stewardship Council (FSC®) certification from Rainforest Alliance, for its chain of custody and controlled timber, and an Eco-Certified Composite™ (ECC) from the Composite Panel Association (CPA).

2.1. PRODUCT DESCRIPTION

Products studied in this report are Particleboard (PB) and Thermofused Laminated Panels (TFL). Uniboard® particleboard panels are manufactured using meticulously selected wood fibers to create high quality, consistent panels for furniture, millwork, cabinetry and countertops. Uniboard® offers two types of particleboard panels: Regular panels and NU Green panels. All NU Green® products meet CARB Phase 2 and TSCA TITLE VI emissions standards, the most stringent environmental guidelines in North America. In fact, the NU Green portfolio goes above and beyond CARB 2, TSCA TITLE VI and SOR-2021-148 standards as they are also offered in ULEF options. NU Green products help builders achieve LEED® certification, the most recognized program to promote “Green” buildings.

There are different grades of Uniboard regular particleboard (M3i, M2, M1, MS, LD) and NU Green panels. They come in a range of densities with an average of 650 kg/m^3 for particleboard and 670 kg/m^3 for the TFL panel. The average thickness is18 mm. They are manufactured in various dimensions (width x length) between 4’x8’ and 5’x12’. Uniboard particleboard panels are used in the production of furniture, millwork, cabinetry and countertops. Uniboard® Canada's Thermofused Laminated Panels (TFL) use particleboard as a substrate. To manufacture TFL panels, particleboard surfaces are covered with Uniboard’s decorative paper layer. Decorative paper is a melamine-impregnated paper manufactured by different suppliers. TFL panels are available in many colour and texture combinations. The collection comes with the most comprehensive complementary product line in the industry.

Figure 1 shows the room scene of Uniboard® Thermofused Laminated Panels. The primary United Nations Standard Products and Services Code (UNSPSC) code for these Uniboard panels is 11122002 and the Construction Specifications Institute (CSI) code is 06 42 00.

Figure 1: Room scene of Uniboard Thermofused Laminated Panels (TFL).

2.1.1. Product specification

Uniboard panels respect the following standards per each of their product analyzed in this study:

- ANSI A208.1-2022 - Raw Particleboard for indoor application.
- ASTM E 1333-14 - Standard Test Method to determine the level of formaldehyde of wood products under specific conditions and using a large chamber.
- SOR-2021-148 - Formaldehyde Emissions from Composite Wood Products Regulations.
- AWMAC – Quality Standards for Architectural woodwork – [last edition].
- ISO 4586:2018 - High-pressure decorative laminates – sheets made from thermosetting resins.
- USGBC LEED - Green Building Rating System™.
- CAN/ULC S102-10/ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- EPA TSCA Title VI - Formaldehyde Emission Standards for Composite Wood Products.
- CARB ATCM 93120 - California Air Resources Board (CARB) 93120 Airborne Toxic Control Measure (ATCM) for formaldehyde emissions from composite wood products.

2.1.2. Technical requirements

Table 1 presents the specific properties and performance data for Uniboard's Particleboard and Thermofused Laminated Panels. Please consult the following link for additional information: https://www.uniboard.com/en/documentation-center

Table 1: Technical data for Uniboard's finished particleboard and decorative panels.

Item	Units	Particleboards	Thermofused laminated panels
Average Thickness	mm	18	
Length x Width	mm	1.245 x 2.464 – 1.549 x 3.073	
Average Density	kg/m^3	6.50E+02	6.70E+02

2.2. MATERIAL COMPOSITION

The weighted average profile of each m^3 of particleboard and TFL panel is calculated based on production data from October 2021 to September 2022. These data represent the inputs, based on dry mass, to produce 1 m^3 including losses during the process. A summary of the values compiled are presented in Table 2.

Table 2: Materials composition of 1 m^3 of Particleboard and Thermofused Laminated Panels.

Materials	Particleboards	Thermofused Laminated Panels
	Ratio (%)	Ratio (%)
Wood	86.06%	83.31%
Adhesive	7.73%	7.48%
Scavenger	0.69%	0.66%
Catalyst	0.32%	0.31%
Water	0.10%	0.10%

Materials	Particleboards	Thermofused Laminated Panels
	Ratio (%)	Ratio (%)
Wax	0.35%	0.33%
Melamine-impregnated Decorative Paper	0.00%	5.02%

Wood fiber materials used are weighted based on dry mass.

2.3. PRODUCT APPLICATION

Uniboard particleboards are used for furniture, millwork, cabinetry and countertop manufacturing. Thermofused laminated panels are ideal for furniture, bathroom and kitchen furnishings, doors of all kinds, storage systems, wall/ceiling cladding, and more. TFL panels are also used to manufacture residential and commercial furniture, and are recommended for vertical and horizontal applications with moderate impact and moderate use.

2.4. MANUFACTURING

The manufacture of Uniboard's panels is a nine-step process: material wood crushing, drying, blending, mat forming, pressing and curing, finishing (cooling, trimming and sanding), packaging, or lamination and packaging. Figure 2 presents the flow diagram for Uniboard's panels.

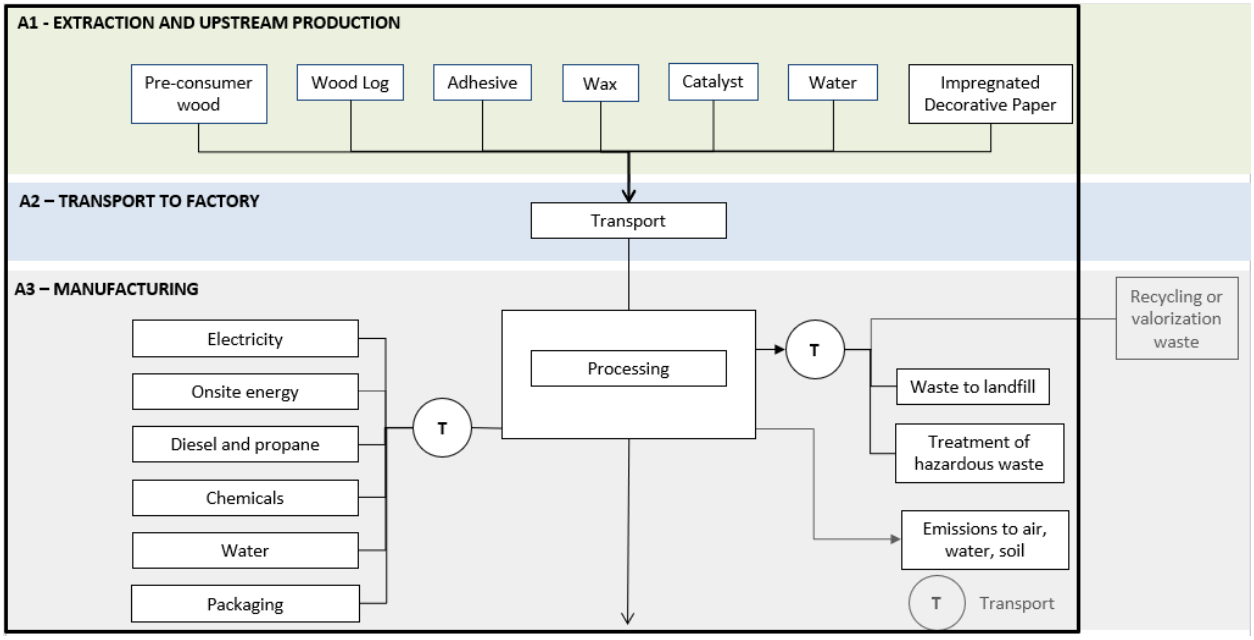

Figure 2: Flow diagram of production processes for Uniboard's panels.

3. LCA CALCULATION RULES

3.1. DECLARED UNIT

The selected declared unit (DU) for this study according to the UL PCR [2] is 1 m^3 of Uniboard panels. **Table 3** presents all products targeted by this report and their respective DU.

Table 3: Declared Unit of studied panels.

Items	Units	Particleboards	Thermofused Laminated Panels
Declared Unit	m^3	1	1
Average Mass	kg	6.50E+02	6.70E+02
Thickness	mm	18	18
Average Density	kg/m^3	6.50E+02	6.70E+02
Moisture Content (based on dry mass)	%	4-6	4-6

3.2. SYSTEM BOUNDARIES

According to UL Environment's PCR **[3]**, the system boundaries are a cradle-to-gate system. The life cycle stage included in the analysis is the production stage. The production stage included A1) Extraction and upstream production, A2) Raw materials transportation to the manufacturing plant and A3) Manufacturing of Uniboard's panels. Table 4 presents the product life cycle stage and its modules included in the system boundaries analyzed in accordance with ISO 21930 **[4]**.

Table 4: Description of the system boundary life cycle stages and related information modules

PRODUCTION STAGE			CONSTRUCTION STAGE		USE STAGE							END-OF-LIFE STAGE			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Extraction and Upstream Production	Transport	Manufacturing	Transport from Gate to Site	Assembly/ Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Key: X = included; MND = module not declared (excluded)

3.3. ALLOCATION

The ISO 14040 allocation procedure states that, whenever possible, allocation should be avoided by collecting data related to the process under study or by expanding the product system [5].

According to the PCR, Part B and section 3.5 allocation rules, mass should be used as the primary basis co-product allocation and the UL PCR Part A specifies only when the difference in revenue from the co-products is low. Based on information provided by the manufacturer, the difference in market value ($) between both co-products is higher (more than 25%). In this study, economic allocation was used. Energy, ancillary and operating materials were allocated between the co-products based on the annual production data received from the manufacturer.

Waste flows undergoing recycling/reuse are excluded from the system boundary. A cut-off approach was used because recycled/reused material is part of raw material preparation for another product system.

According to the UL PCR Part A, material flows with specific inherent properties, such as energy content or elementary composition (e.g. biogenic carbon content), shall always be allocated reflecting the physical flows, irrespective of the allocation chosen for the processes

3.4. CUT-OFF METHODOLOGY

According to the UL Environment PCR – Part A [3], if a mass flow or energy flow represents less than 1% of the cumulative mass or energy flow of the system, it may be excluded from system boundaries. However, these flows should not have a relevant environmental impact. Also, at least 95% of the energy usage and mass flow shall be included. The cumulative material inputs and environmental impacts less than 5% of the total weight of the DU are excluded.

3.5. DATA SOURCES AND QUALITY REQUIREMENTS

Data quality parameters	Data quality discussion
Source of manufacturing data: description of sources of data	Manufacturing data was collected from Uniboard's manufacturing plant located in Sayabec and Val d'or, in the province of Quebec (Canada) for the production year running from October 2021 to September 2022. This data included: total production mass of products produced at the manufacturing plants, as well as the total annual units in m^3 and total production mass of products under study, raw materials entering the production of the products under study, losses of materials, transport mode and distance of materials, energy consumption, water consumption, emissions to the environment at the manufacturing plant, waste treatment and packaging material.
Source of secondary data: description of sources of raw materials, energy source, transport, waste and packaging data	When appropriate, the grid mix was changed for the grid mix of the province or country where the production takes places. Otherwise, ecoinvent data representative of the global market or "rest-of-the-world" were selected as proxies. The wood material dataset and transport data were taken form the US LCI database, which is specific to a North American context.
Geographical representativeness	The manufacturing facility is located in the province of Quebec; hence, electricity consumption is based on the hydropower grid mix. Geographical correlation of the material supply and the selected datasets are representative

Data quality parameters	Data quality discussion
	of each specific area or a larger area. for example, wood material comes mainly from Canada and a low percentage from the USA.
Temporal representativeness	Primary data was collected to be representative of the full year (from October 2021 to September 2022), while this was not always the case for ecoinvent and US LCI datasets. Nevertheless, ecoinvent and US LCI remain the reference LCI databases.
Technological representativeness	Primary data, obtained from the manufacturer, is representative of the current technologies and materials used by the company.
Completeness	All relevant process steps were considered and modeled to satisfy the goal and scope. Cut-off criteria were respected.

4. LIFE CYCLE ASSESSMENT RESULTS

4.1. RESULTS TABLES

It should be noted that Life Cycle Impact Assessment (LCIA) results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The life cycle assessment results are presented per DU. According to the PCR, Part B section 5, the results presented are based on the life cycle impact assessment (LCIA) and the life cycle inventory (LCI).

According to the PCR, the life cycle impact assessment shall be presented for the North American context [3].

LCIA results are presented in Table 5 and Table 6 for the particleboard and thermofused laminated panels, respectively.

Table 5: Particleboard Life Cycle Impact Assessment Results

Impact Categories	Units	Extraction (A1)	Transport (A2)	Manufacturing (A3)
Global Warming Potential	kg CO_2 eq	2.12E+02	3.19E+01	2.51E+01
Biogenic Carbon Removal from product system	kg CO_2	-1.17E+03	0.00E+00	-4.21E+01
Biogenic Carbon Emissions from product system	kg CO_2	0.00E+00	0.00E+00	1.21E+03
Ozone Depletion Potential	kg CFC-11 eq	3.08E-05	1.14E-06	5.58E-06
Acidification Potential	kg SO_2 eq	1.24E+00	1.76E-01	8.75E-02
Eutrophication Potential	kg N eq	4.07E-01	1.34E-02	2.58E-02
Smog Formation Potential	kg O3 eq	1.92E+01	5.52E+00	1.47E+00
Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADPfossil)	MJ surplus	3.47E+02	6.53E+01	4.90E+01

Table 6: Thermofused Laminated Panel (TFL) Life Cycle Impact Assessment Results

Impact categories	Units	Extraction (A1)	Transport (A2)	Manufacturing (A3)
Global Warming Potential	kg CO_2 eq	2.92E+02	3.42E+01	6.52E+01
Biogenic Carbon Removal from product system	kg CO_2	-1.18E+03	0.00E+00	-9.31E+01
Biogenic Carbon Emissions from product system	kg CO_2	0.00E+00	0.00E+00	1.28E+03
Ozone Depletion Potential	kg CFC-11 eq	4.44E-05	1.35E-06	9.43E-06
Acidification Potential	kg SO_2 eq	1.69E+00	1.98E-01	1.63E-01
Eutrophication Potential	kg N eq	6.57E-01	1.49E-02	3.85E-02
Smog Formation Potential	kg O3 eq	2.37E+01	6.07E+00	3.64E+00
Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADPfossil)	MJ surplus	5.35E+02	6.98E+01	1.29E+02

(1): Calculated as per U.S EPA TRACI 2.1, OpenLCA v 1.10.3.

(2): GWP 100, excludes biogenic CO2 removals and emissions associated with biobased products and packaging; 100-year time horizon. GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).

4.2. LIFE CYCLE INVENTORY RESULTS

According to the PCR, the life cycle inventory (LCI) shall be presented for resources used and output flows and waste categories [3]. The environmental parameters used for inventory analysis describe the use of renewable and non-renewable material resources, renewable and non-renewable primary energy and water. The LCI results are presented in Table 7 and Table 8 for the particleboard and TFL panels, respectively

Table 7: Particleboard Life Cycle Inventory Results

Resource use				
Parameters	**Units**	**Production stage**		
		Extraction (A1)	**Transport (A2)**	**Manufacturing (A3)**
RPR_E[3]	MJ, LHV	2.97E+03	2.21E-01	3.70E+02
RPR_M[4]*	MJ, LHV	9.01E+02	N/A	N/A
$NRPR_E$[5]	MJ, LHV	1.96E+03	4.68E+02	4.13E+02
$NRPR_M$[6]*	MJ, LHV	1.42E+03	N/A	N/A
SM[7]	kg	0.00E+00	N/A	0.00E+00
RSF [8]	MJ, LHV	0.00E+00	0.00E+00	1.18E+02
NRSF[9]	MJ, LHV	0.00E+00	0.00E+00	0.00E+00
RE[10]	MJ, LHV	N/A	N/A	6.46E+02
FW[11]	m^3	3.32E-02	N/A	1.83E-01
Output Flows and Waste				
HWD[12]	kg	N/A	N/A	9.96E-02
NHWD[13]	kg	N/A	N/A	8.34E-02
HLRW[14]	m^3	N/A	N/A	N/A
ILLRW[15]	m^3	N/A	N/A	N/A
CRU[16]	kg	N/A	N/A	N/A
MR[16]	kg	N/A	N/A	5.47E-01
MER[16]	kg	N/A	N/A	9.96E-02
EE[16]	MJ, LHV	N/A	N/A	1.69E+00

Table 8: Thermofused Laminated Panel Life Cycle Inventory Results

Resource use				
Parameters	**Units**	**Production stage**		
		Extraction (A1)	**Transport (A2)**	**Manufacturing (A3)**
RPR_E[3]	MJ, LHV	4.26E+03	3.20E-01	1.31E+03
RPR_M[4]*	MJ, LHV	8.73E-01	N/A	N/A
$NRPR_E$[5]	MJ, LHV	3.47E+03	5.01E+02	9.91E+02
$NRPR_M$[6]*	MJ, LHV	1.41E+03	N/A	N/A
SM[7]	kg	0.00E+00	N/A	0.00E+00
RSF [8]	MJ, LHV	0.00E+00	0.00E+00	5.04E+02

Resource use				
NRSF[9]	MJ, LHV	0.00E+00	0.00E+00	0.00E+00
RE[10]	MJ, LHV	N/A	N/A	2.77E+03
FW[11]	m^3	3.31E-02	N/A	8.84E-01
Output Flows and Waste				
HWD[12]	kg	N/A	N/A	1.10E+00
NHWD[13]	kg	N/A	N/A	3.55E-01
HLRW[14]	m^3	N/A	N/A	N/A
ILLRW[15]	m^3	N/A	N/A	N/A
CRU[16]	kg	N/A	N/A	N/A
MR[16]	kg	N/A	N/A	2.33E+00
MER[16]	kg	N/A	N/A	1.10E+00
EE[16]	MJ, LHV	N/A	N/A	1.87E+01

*In the calculation of RPR_M and $NRPR_M$, packaging materials were excluded.

(3): RPR_E = RPRT - RPR_M, where RPRT is equal to the value for renewable energy obtained using the CED LHV.

(4): RPR_M is calculated by multiplying the mass (kg) of the material input (or its components) by the net calorific value (lower heating value) (MJ/kg) of this input as per ACLCA ISO 21930 Guidance [6]. In the calculation of RPR_M, packaging materials were excluded.

(5): $NRPR_E$ = NRPRT - $NRPR_M$, where NRPRT is equal to the value for non-renewable energy obtained using the CED LHV methodology (both non-renewable energy fossil fuel and nuclear).

(6): $NRPR_M$, is calculated by multiplying the mass (kg) of the material input (or its components) by the net calorific value (lower heating value) (MJ/kg) of this input as per ACLCA ISO 21930 Guidance [6]. In the calculation of $NRPR_M$, packaging materials were excluded.

(7): Calculated as per ACLCA ISO 21930 Guidance [6], 6.5 Secondary material, SM: There is no SM involved in the Uniboard panel manufacturing process.

(8): Calculated as per ACLCA ISO 21930 Guidance [6], 6.6 Renewable secondary fuels, RSF: There is RSF involved in the Uniboard panel manufacturing process.

(9): Calculated as per ACLCA ISO 21930 Guidance [6], 6.7 Non-renewable secondary fuels, NRSF: There is NRSF involved in the Uniboard panel manufacturing process.

(10): Calculated as per ACLCA ISO 21930 Guidance [6], 6.8.1 Recovery Energy, RE: There is RE based on ISO 21930, Table 1.

(11): Represents the net use of fresh water at the manufacturing site.

(12): Calculated from life cycle inventory results, based on datasets marked as “hazardous.”

(13): Calculated from life cycle inventory results, based on “non-hazardous” waste.

(14): Calculated as per ACLCA ISO 21930 Guidance [6], 10.3 High-level radioactive waste, conditioned, to final repository. It should be noted that the Uniboard panel manufacturing process does not generate any HLRW. High-level radioactive waste, e.g., when generated by electricity production, consists mostly of spent fuel from reactors.” (ISO 21930:2017, clause 7.2.14).

(15): Calculated as per ACLCA ISO 21930 Guidance [6], 10.4 Intermediate- and low-level radioactive waste, conditioned, to final repository. It should be noted that the Uniboard panel manufacturing process does not generate any ILLRW. Low- and intermediate-level radioactive wastes, e.g., when generated by electricity production, arise mainly from routine facility maintenance and operations (ISO 21930:2017, clause 7.2.14).

(16): There are no Reused Components (CRU) in the Uniboard manufacturing process. Exported energy (EE), materials for recycling (MR) and materials for energy recovery (MER) are accounted for in the analysis.

4.3. CONTRIBUTION ANALYSIS

The aim of this section is to present more details on the contribution to the impacts and resource use of the different life cycle modules of each product studied.

The contribution analysis of Uniboard particleboards (**Figure 3**) indicate that the major contributor module is module A1 for all impact categories, with impacts between 73% and 91%. The major contribution of module A2 are present in the Photochemical Ozone Formation (POF) impact category (21%) due to diesel combustion during truck operations.

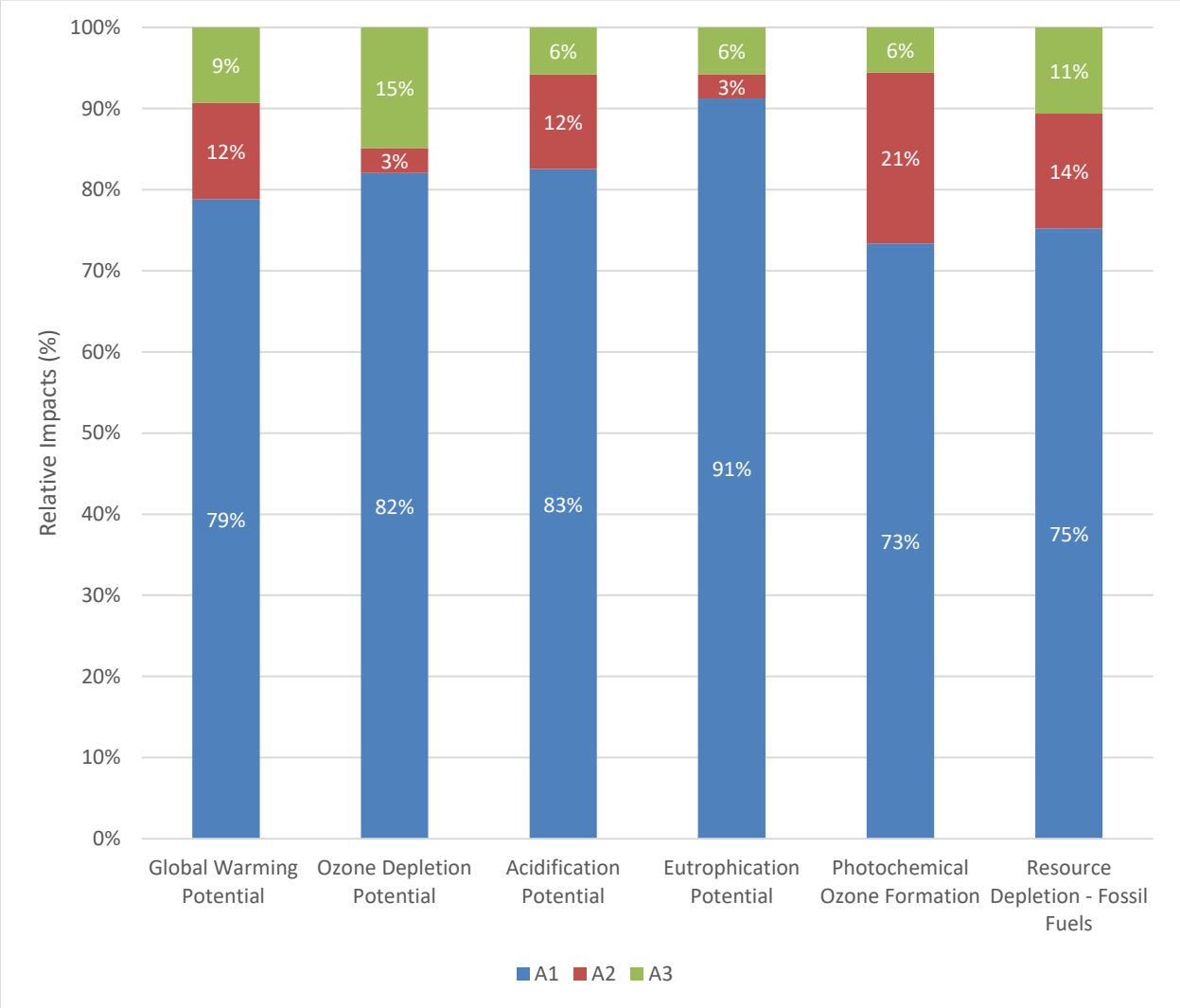

Figure 3: Contribution of each life cycle module for Particleboard.

Breaking down the extraction and upstream production module (A1), Figure 4 indicates that production of MUF adhesive is the major contributor with impacts between 32% and 69% of the total impacts for all indicators.

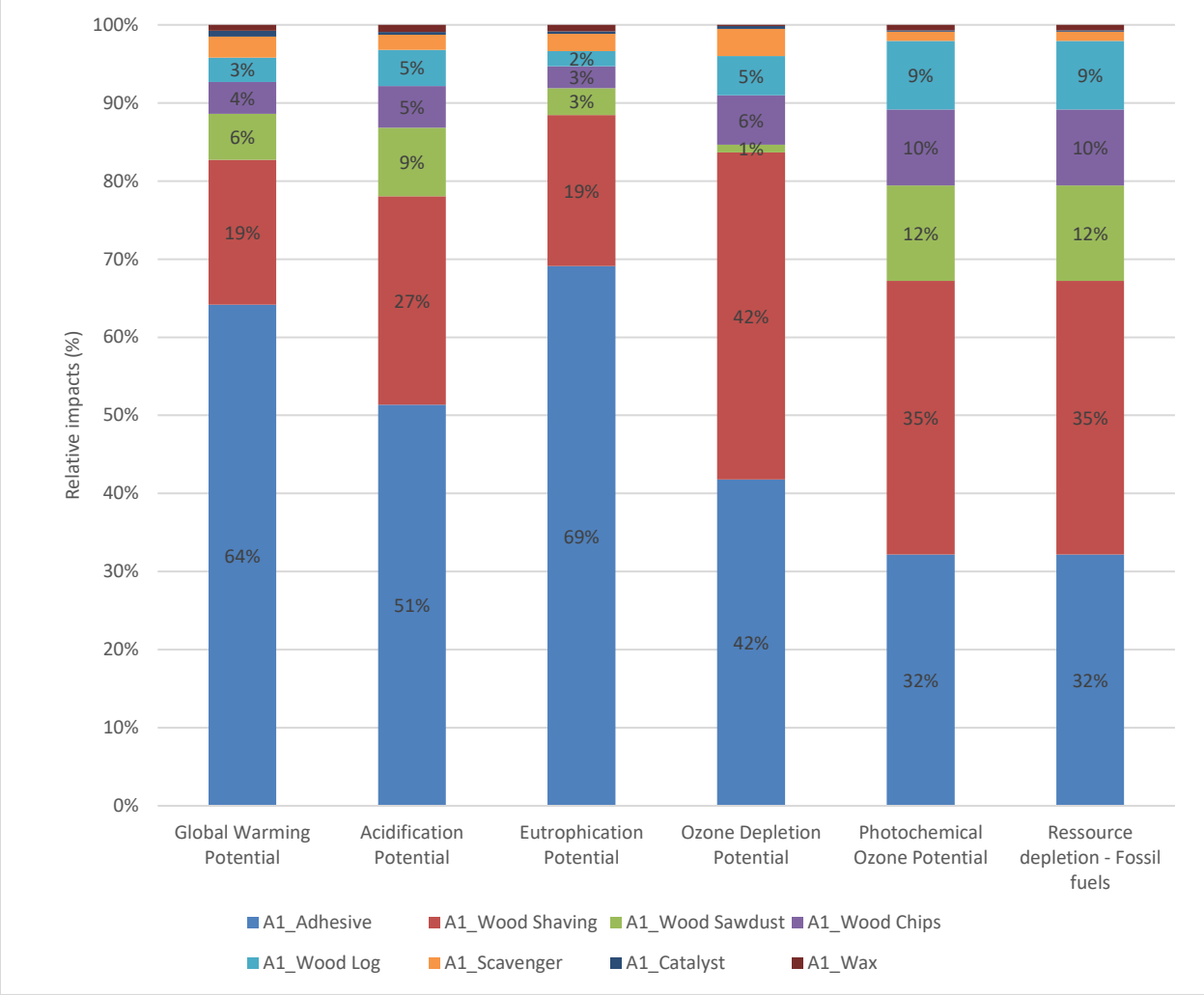

Figure 4: Contribution of material input in module A1 for particleboard.

As presented for the particleboards, the trend is nearly the same for thermofused laminated panels as presented in (Figure 5), as the products studied have similar inputs and outputs. The difference comes from the fact that thermofused laminated panels have melamine-impregnated decorative paper applied on the surface. The impacts of the extraction and upstream production module (A1) represents between 71% and 92% of the total impacts. The impacts of the manufacturing module (A3) represents the second contributor to the total impacts, for all indicators except for the AP and POF impact categories. The impacts of the manufacturing module (A3) represents between 5% and 18% of the total impacts. The major contribution of module A2 are present in the photochemical ozone formation impact category (18%) due to diesel combustion during truck operations.

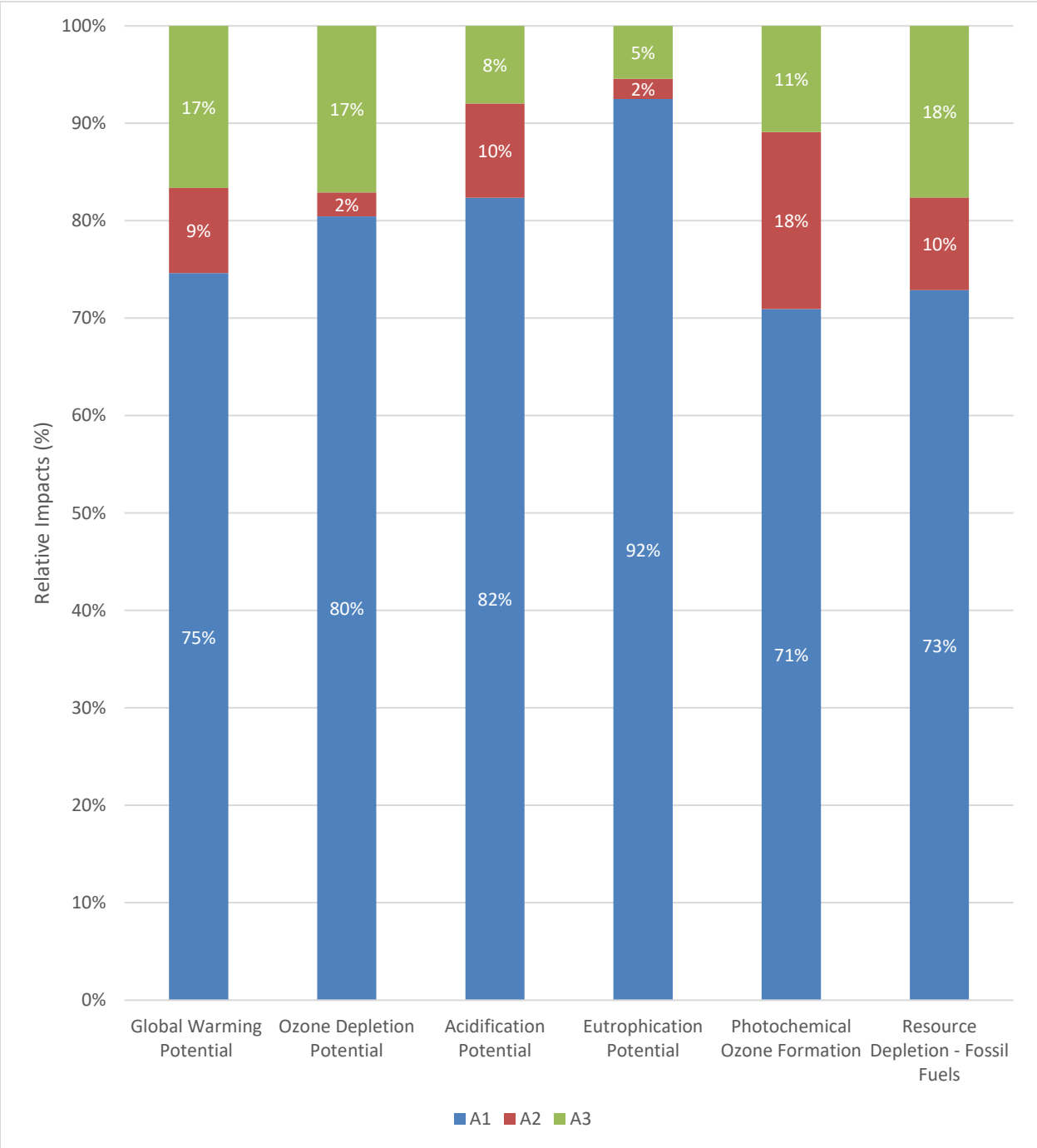

Figure 5: Contribution of each life cycle module for thermofused laminated panels.

Breaking down the extraction and upstream production module (A1), Figure 6 indicates that the production of melamine paper and MUF adhesive are the major contributors with impacts between 45% and 81% of the total impacts for all indicators.

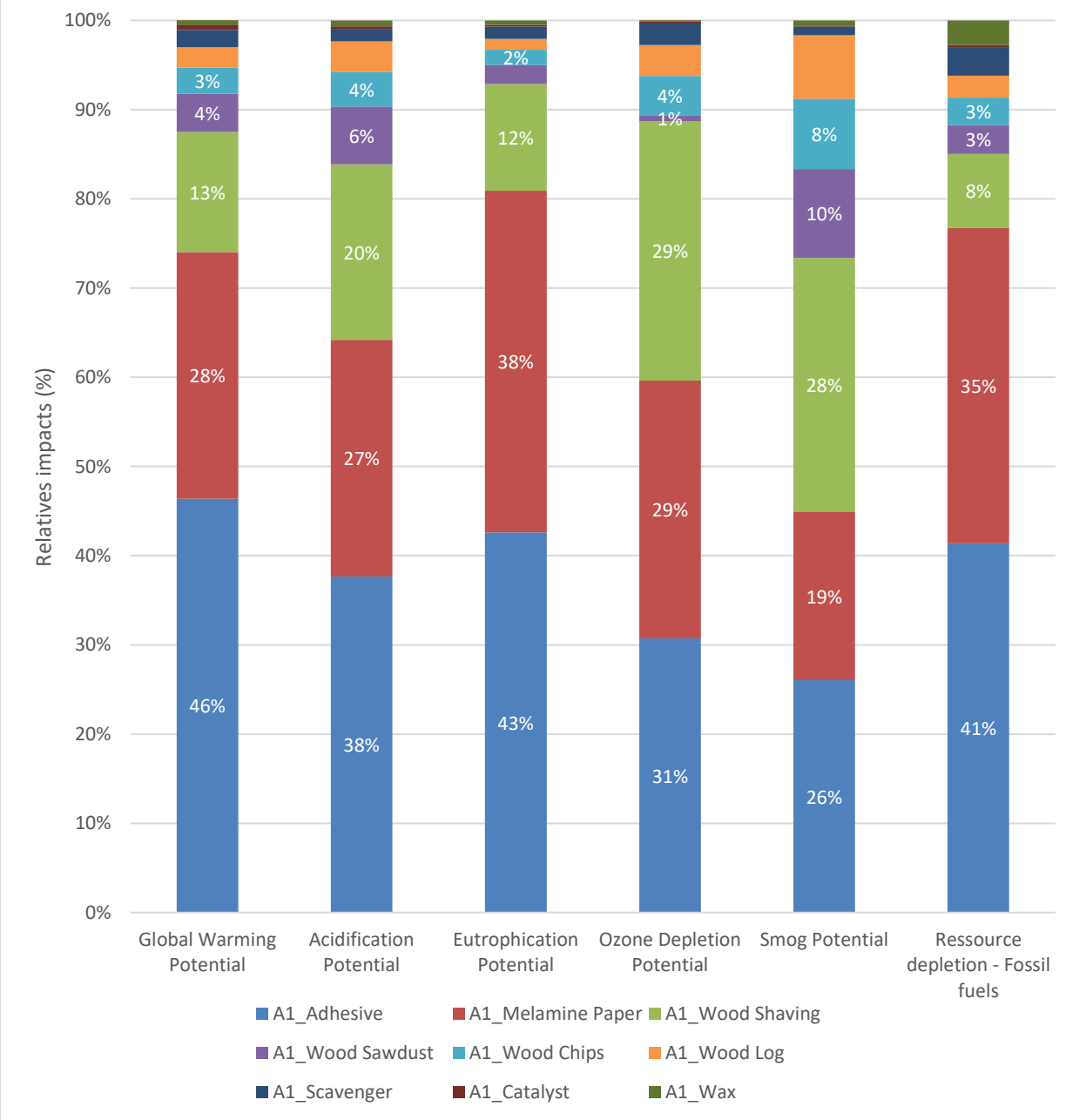

Figure 6: Contribution of material input in module A1 for thermofused laminated panels.

5. ADDITIONAL ENVIRONMENTAL INFORMATION

In addition, Uniboard Canada is part of a third-party verification process with Vertima Inc. where their products and environmental documents are assessed. At the end of the process, they received a Validated Eco-Declaration® (EDS-Environmental Data Sheet) summarizing verified environmental claims.

Uniboard also has a Health Products Declaration (HPD) for its particleboard and TFL panel products.

5.1. CARBON SEQUESTRATION

The amount of biogenic carbon contained within bio-based material leaving the product system shall be declared as technical scenario information in the module where the material is leaving the product system. Table 9 presents the biogenic carbon content in the product at the manufacturing gate.

Table 9: Biogenic carbon content in 1 m^3 of Uniboard's panels at the manufacturing gate.

Modules	Parameters	Units	Particleboards	Thermofused Laminated Panels
A1	Biogenic Carbon Removal from Product	kg CO2 eq.	-1172	-1182
A3	Biogenic Carbon Emission from Product (exported product out to the system boundaries)	kg CO2 eq.	1026	1035
	Biogenic Carbon Removal from Packaging	kg CO2 eq.	-26.56	-26.84
	Biogenic Carbon Emission from Packaging (exported product out to the system boundaries)	kg CO2 eq.	26.54	26.81
	Biogenic Carbon Removal from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO2 eq.	-15.49	-66.00
	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO2 eq.	159.63	210.45
	Biogenic Carbon Removal from Recycling Waste from Renewable Sources Used in Production Processes	kg CO2 eq.	-0.06	-0.26
	Biogenic Carbon Emission from Recycling Waste from Renewable Sources Used in Production Processes	kg CO2 eq.	2.29	2.49

6. REFERENCES

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