

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND ISO 21930:2017

SmartEPD-2025-080-0584-01.2

BP ESGARD Roof Insulation: High Resistance



Date of Issue:
Sep 08, 2025

Expiration:
Sep 08, 2030

Last updated:
Oct 27, 2025



General Information

BP Canada

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Product Name:	BP ESGARD Roof Insulation: High Resistance
Functional Unit:	1 m2
Declaration Number:	SmartEPD-2025-080-0584-01.2
Date of Issue:	September 08, 2025
Expiration:	September 08, 2030
Last updated:	October 27, 2025
EPD Scope:	Cradle to gate with other options A1 - A3, A4, A5, B4, C1 - C4
Market(s) of Applicability:	North America

General Organization Information

Building Products of Canada, a subsidiary of Saint-Gobain, is a leading North American manufacturer of interior building materials including gypsum, ceilings, and insulation as well as exterior building materials which include roofing, vinyl siding, trim, and water protection.

Limitations, Liability, and Ownership

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.

Reference Standards

Standard(s):	ISO 14025 and ISO 21930:2017
Core PCR:	UL Part A PCR for Building-Related Products and Services v.4 Date of issue: March 01, 2022
Sub-category PCR:	UL Part B: Building Envelope Thermal Insulation Products Date of issue: April 10, 2023 Valid until: October 31, 2025
Sub-category PCR review panel:	 Contact Smart EPD for more information.

General Program Instructions:  Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:  Saint-Gobain North American ESG Sustainability Group |  sustainability@saint-gobain.com

EPD Program Operator:  Smart EPD |  info@smartepd.com |  www.smartepd.com |
 585 Grove St., Ste. 145, Herndon, VA 20170, USA

Verification: Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071: 
 Vijay Thakur |  Individual Verifier |  thakur.vijay3011@gmail.com
Independent external verification of EPD, according to ISO 14025 and reference PCR(s): 
 Vijay Thakur |  Individual Verifier |  thakur.vijay3011@gmail.com

Product Information

Functional Unit: 1 m2
Mass: 9.86 kg
Reference Service Life: 75 Years
Product Specificity:  Product Average
 Product Specific

Product Description

This Environmental Product Declaration covers BP ESGARD Roofing Insulation Panels, including High Resistance variants, natural, coated 1 side and coated 6 sides in 1/2 inch thicknesses. These panels are engineered wood fibre insulation products designed to improve roof durability, thermal performance, and water resistance. Both products are composed of interwoven or interlocking wood fibres treated with a water-repellent wax emulsion, enhancing resistance to water absorption. Panels are either natural, factory-coated on one side or on all sides for added protection and compatibility with roofing applications. BP ESGARD Roof Insulation Panels offer excellent insulating properties while increasing the rigidity and strength of roofing systems. They provide robust support for membranes and are ideal surfaces for the application of hot bitumen or asphalt. The High Strength panels offer enhanced transverse load resistance and compressive strength, meeting CAN ULC-S706 Type II Class 2 and ASTM C-208 Type II Grade 2 standards. These qualities make the panels suitable for demanding roofing environments requiring structural reinforcement and reliable thermal insulation.

Further information can be found at: <https://bpcan.com/cat-produits/roof-insulation/>

Product Specifications

Product SKU(s):	BRC05*, BRN05*, BRC10*, BRN10*, BRI10
Product Classification Codes:	EC3 - ThermalMoistureProtection -> Insulation
Form Factor:	ThermalMoistureProtection >> Insulation
Insulation type:	Wood Fiber
Thickness for RSI =1:	48 mm
Thermal resistance:	3.0 m2K/W

Material Composition

Material/Component Category	Origin	% Mass
Wood	Confidential	85.00 – 95.00
Asphalt	Confidential	0.00 – 6.00
Starch	Confidential	1.00 – 3.00
Wax	Confidential	<1.00
Additives	Confidential	<1.00

Packaging Material	Origin	kg Mass
Plastic Bag	Confidential	2.00E-02
Strapping	Confidential	3.06E-03
Wood Plank	Confidential	3.30E-02

Biogenic Carbon Content	kg C per m2
Biogenic carbon content in product	4.58
Biogenic carbon content in accompanying packaging	0.014

Hazardous Materials
No substances required to be reported as hazardous are associated with the production of this product

EPD Data Specificity

Primary Data Year: 2023 -2024

Manufacturing Specificity:

- ✗ Industry Average
- ✗ Manufacturer Average
- ✓ Facility Specific

Averaging:

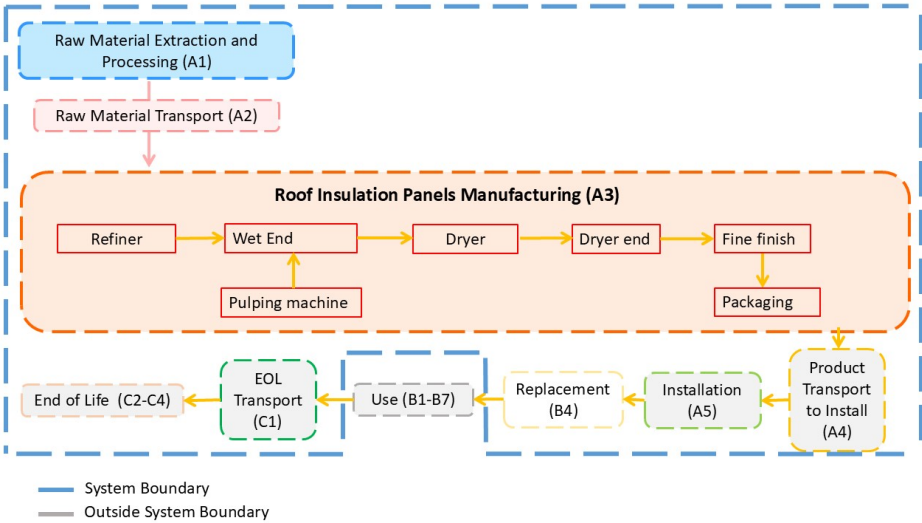
Averaging was not conducted for this EPD

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	✓
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Note:

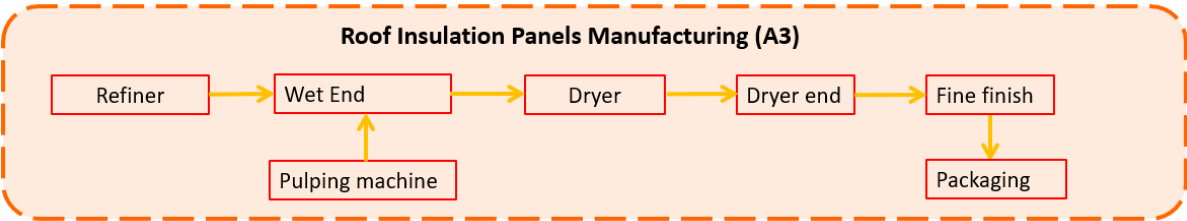
ND = Module not declared



Plants

 BP Canada
420 Dupont Street, Pont-Rouge, Québec G3H 1S2, Canada

Product Flow Diagram



Software and Database

- | | |
|-----------------------------|--|
| LCA Software: |  Sphera LCA for Experts (formerly GaBi) v. 10.9 |
| LCI Foreground Database(s): |  GaBi Professional Database v. 2025.1 |
| LCI Background Database(s): |  Ecoinvent v. 3.10  US LCI v. FY17.Q4.02 |

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

A comprehensive data quality assessment was undertaken to ensure consistency, precision, and reproducibility, particularly for secondary data sources. Wherever secondary data is used, the study relies on critically reviewed and widely recognized databases that include built-in data quality indicators such as representativeness, completeness, temporal correlation, geographical relevance, and technological coverage. These indicators provide a general measure of reliability and uncertainty. Using these data quality metrics, the secondary datasets selected for this study are generally rated as having medium-to-high precision. Preference was given to datasets that are recent, geographically appropriate, and technologically relevant to the modeled system. Where older datasets were used due to lack of alternatives, their limitations have been clearly noted and considered in the interpretation of results.

Primary data was collected directly by the Saint-Gobain North American ESG Department for the relevant manufacturing plant(s). This includes site-specific information on energy and material inputs, emissions, waste generation, water usage, and transportation impacts. Efforts were made to verify this primary data through consultation with plant personnel and internal documentation. Sub-metering and additional on-site monitoring are recommended in future assessments to further improve data granularity and accuracy.

Life Cycle Module Descriptions

This LCA study is characterized as a cradle to gate study, examining the BP ESGARD Roof Insulation and recovery panels, including High Resistance, natural, coated 1 side and coated 6 sides in 1/2" thicknesses product lines from raw material extraction through manufacturing, including packaging, and extending to the product's end-of-life treatment. For this assessment, the Saint-Gobain North America (SGNA) ESG department, in collaboration with personnel at the manufacturing site, collected primary data on energy and material inputs, waste generation, water consumption, emissions, and transportation impacts. The data pertains specifically to the BP Canada wood fiber panel manufactured in Pont-Rouge, QC, and covers the calendar years 2023-2024.

• Raw Materials (Module A1)

A detailed analysis of material inputs was conducted for this study. The cellulosic fibers used in the production of our insulation panels are sourced from post-industrial and post-consumer wood shavings. These shavings are generated during processes such as lumber milling, woodworking, or panel production, and are subsequently collected, processed, and repurposed as a primary raw material input. This declaration is supported by our internal production records and supply chain documentation. To the best of our knowledge, the information provided herein is accurate, complete, and reflects current sourcing practices.

• Transportation of raw materials (Module A2)

Raw materials are transported to the manufacturing sites by standard freight truck, train, or ocean freighters. Unless otherwise noted, transport vehicles are fueled with diesel fuel. This study assumed an average of 800 km for the final shipment of product based on the assumption within the PCR.

• Manufacturing (Module A3)

All the fibers used in the manufacture of wood fiber boards are cellulosic fibers from post-industrial. Wood chips and shavings are refined using a thermomechanical pulping process. Fibers are not bleached nor colored. Water is added to refined fibers to obtain pulp. Water used in process comes from the adjacent Jacques-Cartier River. Additives are mixed in pulp to adjust quality properties.

Wood fiber panels are produced with a papermaking-like process. Fiber pulp resulting from refined fibers, water and additives is uniformly distributed into the wet end of panel-forming machine. After, the material undergoes a drying process where excess moisture is removed. Dry panels are coated and at the end of the process line, panels are stacked on a wood pallet or on wood fiber strips to facilitate manipulation. Wood fiber boards come in a superior weather-resistant packaging. All the water removed during the wet end process is treated on-site. Water is cleaned without using chemicals and cleaned water is returned to the river after being tested conform to environmental laws. Sludge generated during the water treatment process is used as a fertilizer for local farmers.

• Packaging (Module A3)

Packaging of the final product after production is included in the life cycle assessment. The product is covered with a weather-resistant LDPE/LLDPE plastic bag, then stacked on a wood pallet or on woodfiber strips and labeled. Disposal of the packaging materials follows the pathways referenced in Part A.

• Transport from the gate to the site (Module A4)

BP ESGARD Roof Insulation and recovery panels are transported from the manufacturing sites by standard freight truck, train, or ocean freighters. Unless otherwise noted, transport vehicles are fueled with diesel fuel. This study assumed an average of 800 km for the final shipment of product based on the assumption within the PCR.

• Installation (Module A5)

The installation of the BP ESGARD Roof Insulation and recovery panels involves manual labor utilizing staples and mechanical fasteners. All fastening is performed on-site using hand tools or lightweight power tools, without the aid of automated machinery. This stage is labor-intensive and requires skilled installers to ensure secure and precise placement of each panel.

• Use (B1-B7)

The use stage (modules B1B7), with the exception of B4 (Replacement), is excluded from this analysis in accordance with the PCR. Impacts for module B4 are reported separately.

• EOL (Module C1-C4)

The end-of-life phase for the BP ESGARD Roof Insulation and recovery panels was included in the study. The selected service life reflects the expert opinion of the product manufacturer, and the building service life indicated in the PCR. Similar to the installation of the ceiling panels, deconstruction (module C1) is assumed to be manually completed and is considered burden-free. At the end of its service life, the product's end-of-life is modeled as 93% landfill and 7% recycling, reflecting typical disposal practices in Canada, as referenced in Part A. The waste processing module (C3) accounts for this mix. While the panels are largely inert in a landfill, a small portion is assumed to enter recycling streams. There is currently no broader industry consensus for end-of-life scenarios, per PCR guidance; therefore, this study follows these assumptions for modeling purposes.

LCA Discussion

Allocation Procedure

Allocation was conducted based on the production mass data provided by the facility as a percentage of the overall production mass.

Cut-off Procedure

Processes whose total contribution to the final result, with respect to their mass and in relation to all considered impact categories, is less than 1% can be neglected. The sum of the neglected processes may not exceed 5% by mass of the considered impact categories. For that a documented assumption is admissible. For Hazardous Substances as regulated by the HPR (Hazardous Products Regulations) and via Health Canada's national hazard standard WHMIS" the following requirements apply:

- The Life Cycle Inventory (LCI) of hazardous substances will be included, if the inventory is available.
- If the LCI for a hazardous substance is not available, the substance will appear as an input in the LCI of the product, if its mass represents more than 0.1% of the product composition.
- If the LCI of a hazardous substance is approximated by modeling another substance, documentation will be provided. This EPD is in compliance with the cut-off criteria. No known flows were deliberately excluded. Capital items for the production processes (machines, buildings, etc.) were not taken into consideration.

This LCA study complies with the established cut-off criteria, with no known data gaps or exclusions beyond those explicitly listed below. The following processes are excluded from the system boundary in accordance with EN 15804 and ISO 14044 standards:

- Construction of capital equipment (Module A3)
- Maintenance of operational and support equipment
- Human labor and employee commuting
- Overhead natural gas usage for space heating at the manufacturing facility (Module A3)
- Product use phase (Modules B1-B7), except replacement (B4)

These exclusions are standard for a cradle-to-gate assessment and are not expected to significantly affect the overall conclusions of the study

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:

✗ No

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Liters of Fuel:	30 l/100km
Vehicle Type:	Diesel Pow-ered truck/Trailer
Transport Distance:	800 km
Capacity Utilization:	85 %
Packaging Mass:	0.06 kg
Capacity utilization volume factor:	=1
Assumptions for scenario development:	Final products are transported on trucks throughout Canada and USA. This study assumed an average of 800 km for the final shipment of product based on the assumption within the PCR.

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	3 %
Ancillary Materials:	0.0024 kg
Electricity Consumption:	0.012 kWh
Other Energy Carriers:	0.37 MJ
Product Lost per Declared/Functional Unit:	0.31 kg
Waste Materials at the Construction Site Before Waste Processing:	0.37 kg
Mass of Packaging Waste Specified by Type:	0.06 kg
Biogenic Carbon Contained in Packaging:	0.014 kg
Assumptions for scenario development:	This study assumes a 3% product loss rate generated from the installation of the product. In addition, disposal of the packaging material is included in the installation phase. Product loss per functional unit was generated by calculating the total scrap rate for each product. The waste materials at the construction site before waste processing included the product loss per functional unit and packaging waste. Within the LCA FE model, transportation of installation waste and disposal of packaging and product loss were included within this study. All installation waste disposal is based off Part A (Product Category Rules for Building-Related Product and Services: Part A – Life Cycle Assessment Calculation Rules and Report Re-quirements. Version 4. March 2022. UL Environment) guidance.

Replacement (B4)

B4 Module

Reference Service Life:	75 Years
Replacement Cycle:	0.9 (ESL/RSL)-1

End of Life (C1 - C4)
C1 - C4 Modules

Collection Process

Collected with Mixed Construction Waste: 9.86 kg

Recovery

Recycling: 0.69 kg

Landfill: 9.17 kg

Disposal

Product or Material for Final Disposal: 9.86 kg

Removals of Biogenic Carbon: 16.78 kg CO2

Assumptions for scenario development:

This study assumes a product service life of 75 years for BP ESGARD Roof Insulation and recovery panels. The selected service life reflects the expert opinion of the product manufacturer, and the building service life indicated in the PCR. Similar to the installation of the ceiling panels, deconstruction (module C1) is assumed to be manually completed and is considered burden-free. At the end of its service life, the product's end-of-life is modeled as 93% landfill and 7% recycling, reflecting typical disposal practices in Canada, as referenced in Part A. The waste processing module (C3) accounts for this mix. While the panels are largely inert in a landfill, a small portion is assumed to enter recycling streams. There is currently no broader industry consensus for end-of-life scenarios, per PCR guidance; therefore, this study follows these assumptions for modeling purposes.

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1, CML 2016 v4.8

per 1 m2 of product .

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Method	Unit	A1	A2	A3	A1A2A3	A4	A5	B4	C1	C2	C3	C4
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	-1.57e+1	3.71e-1	6.52e+0	-8.81e+0	2.97e-1	4.07e-1	-2.31e+0	0	3.15e-2	0	2.14e+1
GWP-fossil	IPCC AR5 GWP 100	kg CO2 eq	1.11e+0	3.71e-1	6.56e+0	8.04e+0	2.97e-1	3.72e-1	1.20e+1	0	3.15e-2	0	4.63e+0
ODP	TRACI 2.1	kg CFC 11 eq	8.87e-9	1.39e-11	3.55e-8	4.44e-8	1.11e-11	5.85e-12	4.00e-8	0	1.18e-12	0	1.02e-14
AP	TRACI 2.1	kg SO2 eq	5.93e-3	2.80e-3	4.24e-3	1.30e-2	1.76e-3	2.69e-3	3.52e-2	0	1.87e-4	0	2.15e-2
EP	TRACI 2.1	kg N eq	3.86e-3	1.60e-4	5.41e-4	4.56e-3	9.74e-5	4.19e-4	1.15e-2	0	1.04e-5	0	7.68e-3
POCP	TRACI 2.1	kg O3 eq	1.64e-3	6.21e-5	2.57e-4	1.96e-3	4.47e-5	4.84e-5	2.13e-3	0	4.75e-6	0	3.11e-4
ADP-fossil	CML 2016 v4.8	MJ	3.09e+0	6.48e-1	1.31e+1	1.68e+1	5.18e-1	3.57e-1	1.63e+1	0	5.50e-2	0	4.19e-1

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Global Warming Potential or Climate Change is an indicator aimed at including in a single value the added effect of all the substances contributing to the greenhouse effect.

Global Warming Potential (GWP-Total) includes biogenic carbon, fossil carbon, land use and land use change. To calculate GWP-Total within the above table, the equation below is used:

$$\text{GWP-total} = \text{GWP-biogenic} + \text{GWP-fossil} + \text{GWP-luluc}$$

- *GWP-total* or *GWPtotal* (including biogenic) is the sum of GWP-biogenic, GWP-fossil and GWP-luluc
- *GWP-biogenic* only includes biogenic carbon which is carbon that is stored in bio-sourced materials, like plants, trees, and soil. This excludes fossil.
- *GWP-fossil* or *GWPtotal* (excluding biogenic) only includes fossil carbon which is the carbon dioxide emitted when fossil fuels like coal, oil, or natural gas are combusted. This excludes biogenic.
- *GWP-luluc* only includes the greenhouse gas emissions that arise in connection with changes in the specified carbon stock as a result of land use and land use change, such as deforestation.

Depending on the required or optional standards, GWP can be reported with different methods and indicators including United States Environmental Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI 2.1, etc.), Intergovernmental Panel on Climate Change (IPCC) Assessment Report (AR 5, AR 6, etc.), Environmental Footprint (EF 3.0, 3.1), and/or EN 15804.

GWP can be reported on a time frame such as GWP 100 for 100-year time horizon.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicators

per 1 m2 of product .

Indicator	Unit	A1	A2	A3	A1A2A3	A4	A5	B4	C1	C2	C3	C4
RPRE	MJ	1.08e+2	0	5.03e+1	1.58e+2	0	2.11e+0	1.45e+2	0	0	0	4.01e-1
RPRM	MJ	1.61e+2	0	7.48e+1	2.36e+2	0	3.14e+0	2.16e+2	0	0	0	5.95e-1
RPRT	MJ	2.69e+2	0	1.25e+2	3.94e+2	0	5.26e+0	3.61e+2	0	0	0	9.96e-1
NRPRE	MJ	2.70e+1	4.71e+0	8.92e+1	1.21e+2	3.77e+0	2.68e+0	1.18e+2	0	4.00e-1	0	3.23e+0
NRPRM	MJ	0	0	0	0	0	0	0	0	0	0	0
NRPRT	MJ	2.70e+1	4.71e+0	8.92e+1	1.21e+2	3.77e+0	2.68e+0	1.18e+2	0	4.00e-1	0	3.23e+0
SM	kg	9.14e+0	0	0	9.14e+0	0	0	8.23e+0	0	0	0	0
FW	m3	5.11e-2	0	2.91e-1	3.42e-1	0	5.91e-3	3.14e-1	0	0	0	9.00e-4

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRM or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 m2 of product .

Indicator	Unit	A1	A2	A3	A1A2A3	A4	A5	B4	C1	C2	C3	C4
HWD	kg	2.19e-4	0	3.51e-8	2.19e-4	0	1.20e-9	1.97e-4	0	0	0	7.98e-10
NHWD	kg	4.60e-2	0	4.24e-2	8.84e-2	0	3.44e-1	8.10e+0	0	0	0	8.57e+0
RWD	kg	0	0	0	0	0	0	0	0	0	0	0
HLRW	kg	2.07e-7	0	2.90e-7	4.97e-7	0	1.51e-8	4.96e-7	0	0	0	3.84e-8
ILLRW	kg	1.68e-4	0	2.45e-4	4.13e-4	0	1.28e-5	4.14e-4	0	0	0	3.43e-5
CRU	kg	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0	6.90e-1	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0
MNER	kg	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 1 m2 of product .

Indicator	Unit	A1	A2	A3	A1A2A3	A4	A5	B4	C1	C2	C3	C4
BCRP	kg CO2	-1.68e+1	0	0	-1.68e+1	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	0	0	0	0	1.68e+1
BCRK	kg CO2	0	0	-5.00e-2	-5.00e-2	0	0	0	0	0	0	0
BCEK	kg CO2	0	0	0	0	0	5.00e-2	0	0	0	0	0
BCEW	kg CO2	0	0	0	0	0	0	0	0	0	0	0
CCE	kg CO2	0	0	0	0	0	0	0	0	0	0	0
CCR	kg CO2	0	0	0	0	0	0	0	0	0	0	0
CWNR	kg CO2	0	0	0	0	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

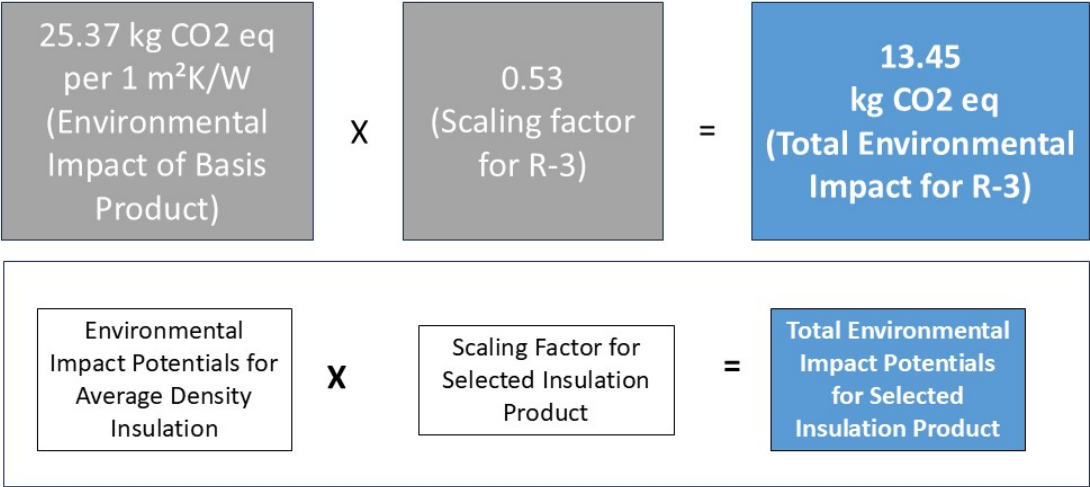
Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Impact Scaling Factors

Product Name and/or Product Attribute	Product R-Value	Scaling Factor
Pseudo product for RSI=1	R-5.68	1.00
BP ESGARD Roof Insulation: High Resistance – Coated 1 Side (1/2")	R-3.0	0.53

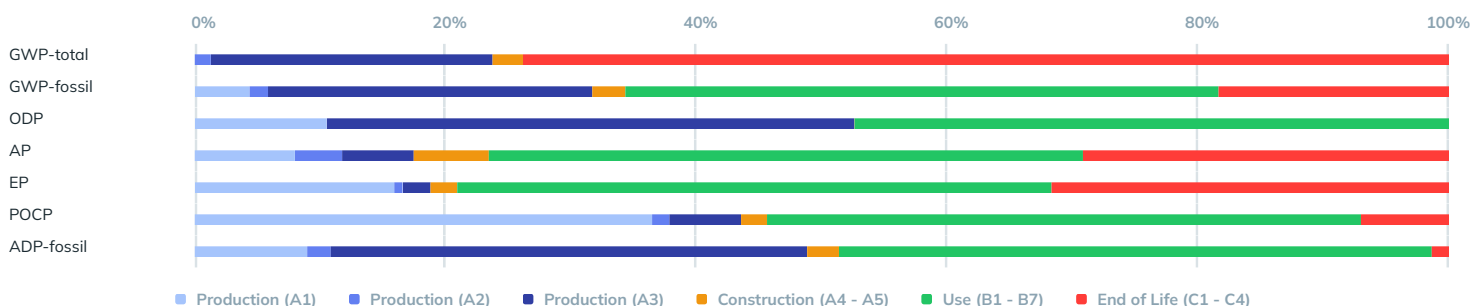
The scaling factors, shown above are based on the density of the product per area of the BP ESGARD Roof Insulation: High Resistance Coated 1 Side (1/2) produced by BP Canada . To determine the impacts for various R-values, the environmental impacts presented in this report can be multiplied by the above scaling factors to determine the impacts per square meter.



Interpretation

To fully understand the results of the life cycle assessment, it is crucial to comprehensively review and ensure completeness, sensitivity, and consistency. The completeness check ensures that all relevant processes, inputs, and outputs are considered in the LCA. This study carefully examined key stages such as raw materials, raw material transportation, and manufacturing, and found no significant data gaps. The sensitivity check supported these findings by exploring the impacts of varying natural gas consumption by 10%, showing that changes in natural gas usage could reduce environmental impacts. A consistency check was also performed to ensure that the assumptions, data sources, and methodologies used in the LCA were applied consistently and aligned with the study's goals. These checks validate the reliability of the LCA findings and emphasize the significant impact of manufacturing processes, energy efficiency, raw material selection, and end-of-life considerations on the overall environmental performance of the products studied

The results of the life cycle assessment indicate that replacement(B4), the manufacturing process(A3), end of life(C1-C4) and raw material(A1) phases have the most significant impacts on the environmental performance of the products under study. More than 60% of the overall global warming potential of each thickness is attributed to the manufacturing process. The majority of the manufacturing impacts are due to the use of natural gas, which contributes to 95% of the replacement(B4). Improving energy efficiency at the manufacturing facility in Pont Rouge, QC would help to reduce the overall environmental impacts for all product groupings. Moreover, the sensitivity analysis of the natural gas impacts at 10% of the current manufacturing model provides valuable insights into the influence of energy inputs on the environmental impact intensity of wood fiber panels production. The results indicate that reducing natural gas consumption by 10% could achieve a more significant decrease in overall environmental impact potentials. These findings underscore the importance of prioritizing natural gas efficiency improvements to achieve more substantial environmental benefits in wood fiber panels production.



Additional Environmental Information

• Environment and Health During Manufacturing

Building Products of Canada has well-established Environmental, Health, and Safety (EHS) and product stewardship programs which help to enforce proper evaluation and monitoring of chemicals that are chosen to manufacture products. These programs ensure that all environmental and WHMIS requirements are met or exceeded to ensure the health and safety of all employees and contractors.

• Environment and Health During Installation

All recommendations should be utilized as indicated by Safety Data Sheets and installation guidelines.

• Water

This product is impregnated with a water-repellent petroleum wax emulsion that imparts a high resistance to water absorption.

• Delayed Emissions

No delayed emissions are expected from this product

Further Information

A manufacturer shall not make claims based on an industry-average EPD which leads the market to believe the industry-average is representative of manufacturer-specific or product-specific results.

Additional Information – End-of-Life Sensitivity Scenarios

In addition to the baseline end-of-life modeling (93% landfill and 7% recycling for Canada, as referenced in Part A), two sensitivity scenarios are provided to illustrate the full range of potential outcomes:

- 100% landfill disposal
- 100% recycling

These scenarios are modeled separately and presented to provide transparency and to reflect possible variations in end-of-life management practices.

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- ISO 21930:2017 Sustainability in building construction Environmental declaration of building products

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