ENVIRONMENTAL PRODUCT DECLARATION (EPD)

AD Series Steel Siding



The development of this product-specific environmental product declaration (EPD) for AD series steel siding was commissioned by Vicwest. This Type III EPD was developed in compliance with CAN/CSA-ISO 14025 and ISO 21930:2017 and has been verified under Groupe AGÉCO.

This EPD includes life cycle assessment (LCA) results for raw material supply, transport and manufacturing and end of life (cradle-to-gate with options). For more information about Vicwest AD series steel siding product offers, please visit https://www.vicwest.com

Environmental Product Declaration

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

0075-1052
December 2024-December 2029

XCarb® Towards net zero steel

This environmental product declaration (EPD) is in accordance with CAN/CSA-ISO 14025, ISO 21930:2017 and the PCR noted below. EPDs within the same product category but from different programs may not be comparable.

EPD program operator	CSA Group 178 Rexdale Blvd, Toronto, ON, Canada M9W 1R3 www.csagroup.org
General program instructions	CSA-SDP-5-13 CSA Group program operator rules for Type III environmental product declarations (2013)
Manufacturer name and address	Vicwest. 5050 South Service Road, Unit 200, Burlington, ON L7L 5Y7, Canada https://www.vicwest.com
Declaration number	0075-1052
Declaration product & declared unit	1 metric ton of AD series steel siding with a density of 7,800 kg/m3 or 487 lb/ft3
Reference PCR and version number	Product Category Rule Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements (version 4.0) UL Environment – Valid from March 2022 until March 2027. Product Category Rule Guidance for Building-Related Products and Services Part B: Designated Steel Construction Product EPD Requirements (version 2.0) UL Environment - Valid from August 2020 until August 2025 UN CPC code: 412
Markets of applicability	Canada
Date of issue	December 17, 2024
Period of validity	December 17, 2024 to December 16, 2029
EPD type	Product-specific
Dataset variability	Not applicable
EPD scope	Cradle-to-gate with options: production (A1-A3), C1-C4 and D
Year(s) of reported primary data	January 2023-December 2023
LCA software & version number	Gabi 10.7
LCI database(s) & version number	Gabi 10.7, Ecoinvent 3.8 Background dataset for North American hot-rolled coil, published by American Iron and Steel Institute (AISI, 2020) LCI of steel scrap from Worldsteel Association (2021)
LCIA methodology & version number	TRACI 2.1& IPCC 2013 AR5

The sub-category PCR review was conducted by:	Thomas Gloria, Industrial Ecology Consultants (chair) 35 Bracebridge Rd. Newton MA 02459 t.gloria@industrial-ecology.com Brandie Sebastian, JBE Consultants James Littlefield, Independent Consultant
This declaration was independently verified in accordance with ISO 14025:2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v4.0 (March 2022), in conformance with ISO 21930:2017, serves as the core PCR with additional considerations from the USGBC/UL Environment Part A Enhancement (2017)	__ Internal x External
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Farid Safari ArcelorMittal Global R&D 1330 Burlington St. E Hamilton, ON, L8N 3J5
The life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Hugues Imbeault-Tétreault Groupe AGÉCO 1995, Frank-Carrel Street, suite 219 Quebec (Quebec) G1N 4H9

Limitations

The environmental impact results of steel products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the steel product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted. See Section 3.10 for additional EPD comparability guidelines. Environmental declarations from different programs (ISO 14025) may not be comparable.

1. Description of Organization

Vicwest is one of North America's leading manufacturers and distributors of exterior building products, including metal roofing, siding, decking, insulated metal panels, and architectural panels. Serving residential, industrial, commercial, institutional, and agricultural construction markets, Vicwest has been trusted since 1930 for engineering and manufacturing durable solutions that can withstand even the harshest climates. With six manufacturing facilities across Canada, we prioritize sustainable production practices that reduce energy use and waste, ensuring our products are as environmentally responsible as they are reliable.

We deliver in ways that are inspirational. Our design engineers are at the forefront of creating metal building materials that achieve virtually any design, providing architects and contractors with the flexibility and innovation they need for their projects. This commitment to versatile, long-lasting building solutions has made Vicwest a preferred partner for creating structures that stand the test of time.

2. Description of Product

AD Series wall panels are a concealed fastener rainscreen/wall panel system featuring four profiles with a bold box design configuration. They are an exceptional choice for designers seeking sleek architectural aesthetics as they are offered in a variety of different commercial paint and coating systems, including Weather XL, PVDF, Signature or Signature Matte, Polyurethane, and Expressence Architectural Series wood grain finishes. Manufactured in Alberta and Ontario Canada using Canadian made steel. The CSI classification number is 07 42 13.13 for Formed Metal Wall Panels, and the UNSPSC code class is 301518.

Table 1 Product Specifications

Name	Value
Product Name	AD Series: AD150, AD200, AD200R, AD275, AD275R, AD300, AD300R
Material	33 Grade Steel
Thickness	0.7493 mm – 0.9017 mm
Product Description	20 & 22- Gauge Steel,
Classification	Coated building product- cladding
Manufacturing Location	Canada (Stratford, ON & Acheson, AB)

2.1 Description of XCarb™ RRP

XCarb™ is the new brand name for ArcelorMittal's ongoing global program of steelmaking innovation targeted at carbon-neutral steel by 2050. The initiatives that are part of XCarb™ aim to reduce the carbon footprint of ArcelorMittal and of its customers. The XCarb™ Recycled and Renewably Produced (RRP) applies to products made via the Electric Arc Furnace (EAF) route using a minimum 70% scrap content and 100% renewable electricity for EAF process. By using above average scrap content and renewable energy, XCarb™ RRP products have a GHG footprint per tonne of finished steel that is significantly lower than the industry average.

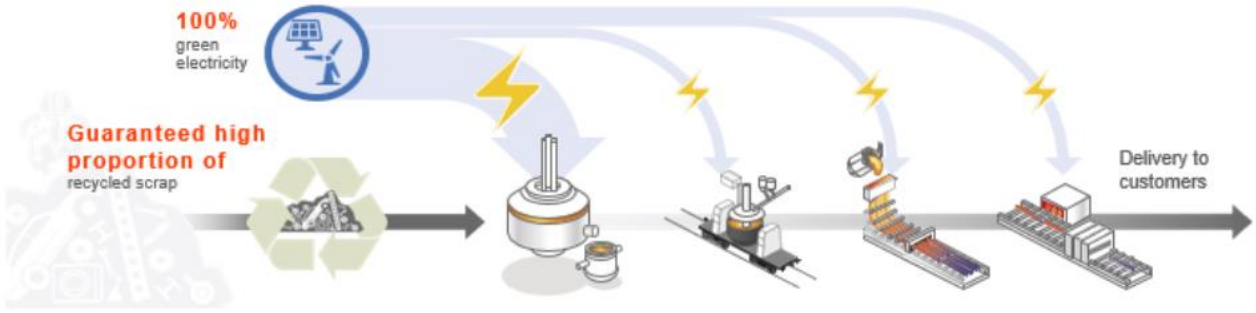


Figure 1 XCarb™ RRP production process

2.2 Standards

The steel siding in this EPD is specified by the CSSBI 20M and 23M standards.

2.3 Material content

A description of the composition of AD series steel siding is provided in Table 2.

Table 2 Material content for AD series steel siding

Materials	Typical Material Specifications	Weight %
Steel	0.95 mm (20 gauge)	98
Metallic coating & paint	180 g/m² (G60)	2

2.4 Production of AD series steel siding

XCarb™ RRP coils are manufactured through the EAF steelmaking method. The production process commences with the extraction of raw materials, primarily iron ore, hard coal, and limestone. These materials undergo preparation in coke making and pelletizing plants before being introduced into Blast Furnace (BF). Pig iron, produced in blast furnaces, is subsequently combined with steel scrap in the EAF, constituting approximately 75% of the total metal.

The EAF melts the scrap, purifies the mixture by removing the impurities, and lowers the carbon content in the molten steel. The liquid steel undergoes ladle metallurgy refining where additional elements are introduced to achieve a specific chemical composition. Subsequently, the refined steel is continuously cast into slabs through molds, which are then hot rolled into coils. The resulting product is known as hot rolled steel.

The hot rolled coils undergo pickling to remove scale using hydrochloric acid before being processed through a cold rolling mill to achieve their final thickness. Following this, the cold rolled coils proceed to a hot dip galvanized line where they receive a zinc or Zinc-Aluminum coating. Next, the hot dip galvanized coils go through the paint coil coating process before being

transported for roll forming and manufacturing. Roll forming involves continuously bending the steel strip through successive sets of rolls, with each set contributing incrementally to achieving the desired profile. The steel coils are roll formed into various profiles and then cut to the required lengths for panels based on the specific requirements of building projects. Since different types of AD series are produced in Vicwest's manufacturing facilities, plant inputs and outputs were averaged over the total mass of produced sidings. Transporting the finished steel products to the manufacturer's site involves logistical planning and careful coordination to ensure timely delivery. Effective transportation management is essential to meet project timelines, guaranteeing that the steel arrives at the manufacturer's facility.

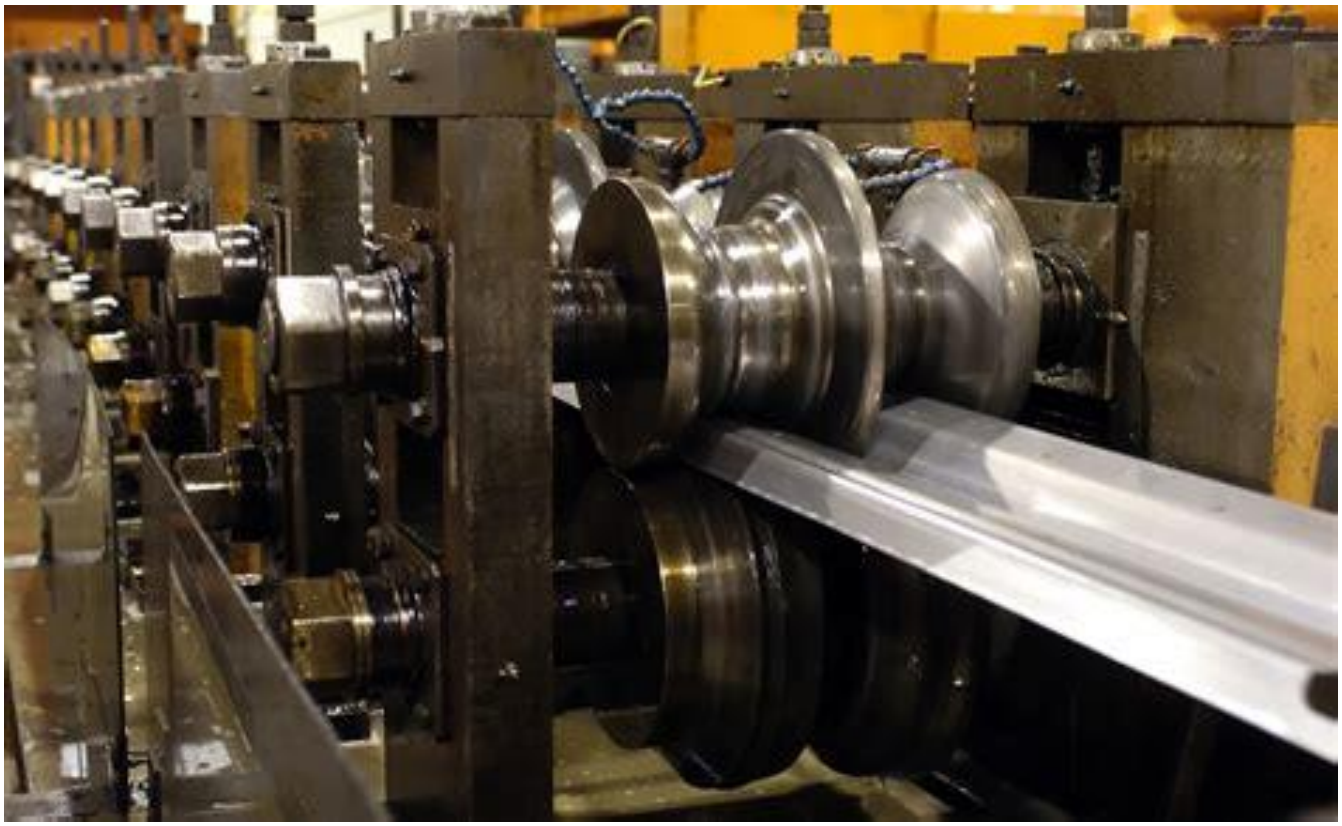


Figure 2 Example of roll forming process.

Deconstruction focuses dismantling structures to recover valuable materials like steel for reuse or recycling, aiming to minimize waste. Transporting to the disposable site and waste processing involves segregating steel and other materials through cleaning, shredding, and melting processes. Responsible disposal of non-recyclable waste adheres to existing environmental regulations. Additionally, reuse, recycling, and energy recovery of materials, especially steel, yield significant net benefits. These practices reduce energy consumption, greenhouse gas emissions, and resource depletion compared to manufacturing new materials.

3. Scope of EPD

3.1 Declared Unit

The declared unit for this EPD is one metric ton of steel siding.

Table 3 Declared unit for AD series steel siding

Parameter	Value (SI units)
Declared Unit	1 metric ton
Density	7,800 kg/m^3

3.2 System Boundaries

Figure 3 indicates the process flow diagram for AD series steel siding production. Excluded modules are shown with dotted lines. The scope for the EPD is cradle-to-gate with options as shown in Table 4. Note that the reference service life is not specified as the study does not cover life cycle stages for product use.

Table 4 Life cycle stages considered according to the PCR

[**x**: included in the scope, MND: module not declared]

Product Stage		Included within scope
A1	Raw material supply	x
A2	Transport	x
A3	Manufacturing	x
Construction Process Stage		
A4	Transport to site	MND
A5	Assembly/Install	MND
Use Stage		
B1	Use	MND
B2	Maintenance	MND
B3	Repair	MND
B4	Replacement	MND
B5	Refurbishment	MND
Use Stage, related to the operation of the building		
B6	Operational energy use	MND
B7	Operational water use	MND
End of Life stage		
C1	Deconstruction	x
C2	Transport	x
C3	Waste processing	x
C4	Disposal	x
Benefits and loads beyond the system boundary		
D	Reuse, recovery, and/or recycling potentials	x

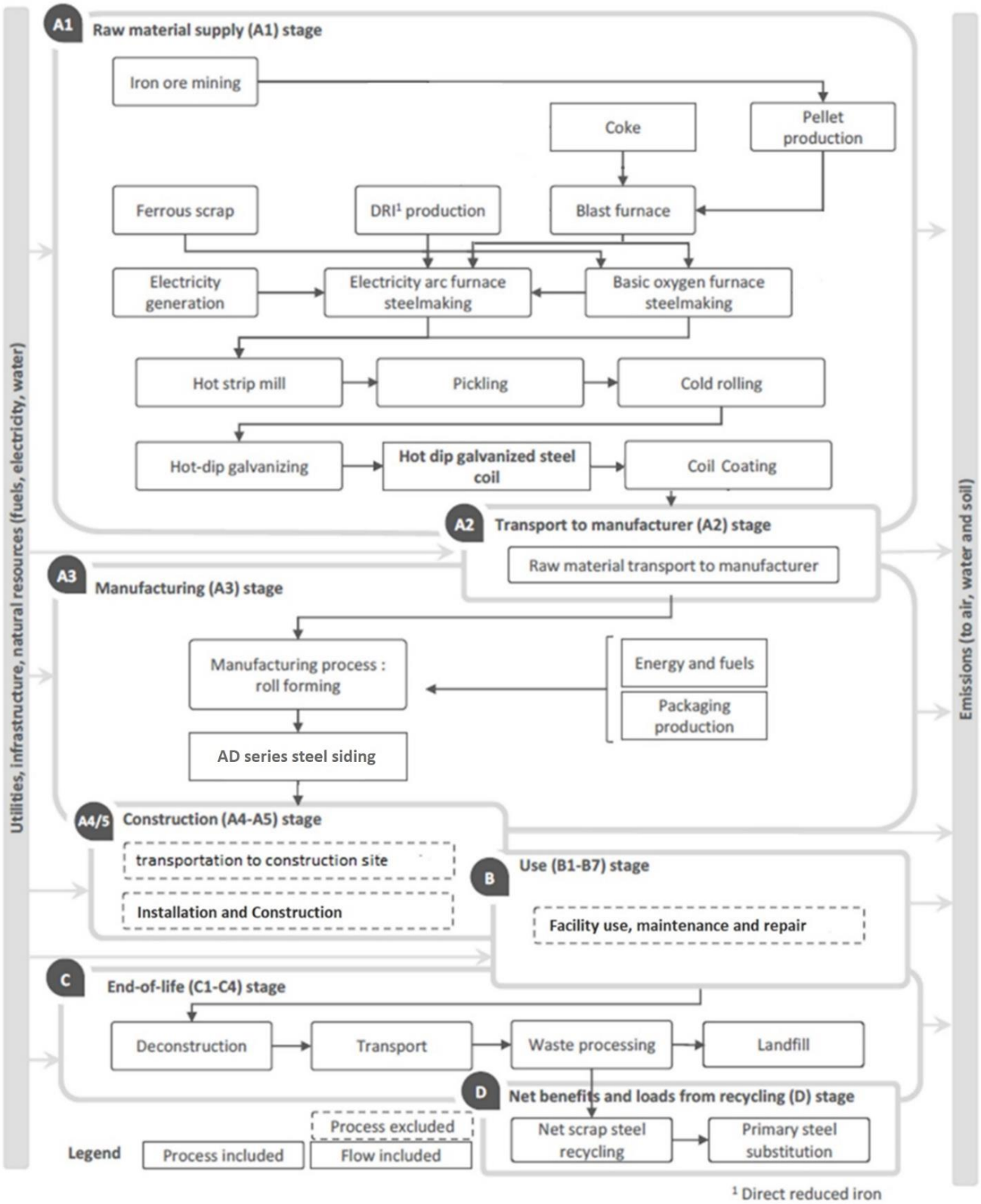


Figure 3 Process flow diagram for AD series steel siding production

4. Environmental impacts

This cradle-to-gate with options life cycle assessment is compliant with ISO 14040 and 14044 and the Product Category Rule (PCR) Guidance for Building-Related Products and Services Part B: Designated Steel Construction Product EPD Requirements v.2. Environmental impacts were calculated using the TRACI 2.1 & IPCC 2013 AR5 impact assessment methods, thus yielding six environmental impact categories. A description of these impact categories is provided in the glossary (section 7.2). These six impact categories are globally deemed mature enough to be included in Type III environmental declarations.

4.1 Criteria for the exclusion of inputs and outputs

This study complies with the rules defined by worldsteel's procedure of data inventory.

1. All energetic inputs to the process stages were recorded, including heating fuels, electricity, steam and compressed air.
2. The sum of the excluded material flows must not exceed 5% of mass, energy, or environmental relevance. However, in reality at least 99.9% of material inputs to each process stage were included, which is in line with the ISO 21930 requirement (<1%)
3. Input scrap does not carry a burden in module A1.

4.2 Data Quality

Primary data for module A1 was collected from the ArcelorMittal Dofasco site in 2021 for hot dip galvanized coil production and Baycoat coil coating for paint coil coating process. The completeness of data for coating is good since Baycoat is one of only two paint coil coating lines in Atlantic industries for manufacturing and roll forming operation. For manufacturing (module A3), a dataset from the Vicwest roll forming operation sites was used. Data for this dataset was collected by Vicwest for a full year of operations occurring between January 2023 and December 2023. The data is representative of the North American context and technologies used. Table 5 presents the main sources of data used for the LCA. The LCA model was developed with Gabi 10.7 software and database. Table 6 summarizes the data quality assessment for each module included in the LCA based on the parameters listed in the PCR.

Table 5 Data sources for the LCA of AD series steel siding

Module	Main Processes	Data Source	Region	Year
A1	Raw material extraction and processing to produce AD series steel siding	Primary data collection	Hamilton, ON	2021
A1	Paint Coil Coating	Primary data collection	Hamilton, ON	2021
A2	Transportation to fabricators	Primary data collection	Canada	2021
A3	AD series steel siding manufacturing	Vicwest	Canada	12 consecutive months from Jan 2023 - Dec 2023

C1	Deconstruction	GaBi 10.7	Global	2021
C2	Transportation to waste processing	GaBi 10.7	U.S.	2021
C3	Waste processing	Ecoinvent 3.8	Global	2021
C4	Disposal of waste	GaBi 10.7	Europe	2021
D	Credit for end-of-life recycling	Worldsteel	Global	2020

Table 6 Data quality assessment

Data quality parameters	Data quality assessment for each module
Time-related coverage	All data are from within the last 10 years with most primary data collected in 2021. Time-related coverage is therefore considered good.
Geographical coverage	All primary data collected for the manufacturers (A2 and A3 stages) were specific to the manufacturing location in Canada. For steel mills (A1 stages), data for hot dip galvanized coil is for ArcelorMittal Dofasco production in Canada. Overall, geographical coverage is good.
Technology coverage	Very recent annual data covering AM Dofasco's EAF steelmaking technologies for steel coil production routes. Technological representativeness is therefore good.
Reliability	The majority of the relevant foreground data are measured data or calculated based on primary information provided by steel mills (A1 stage) or manufacturers (A2 and A3 stages). Therefore, reliability is considered to be high for A1-A3. Secondary data for end-of-life stages are considered good.
Completeness	For the data collected from the manufacturers (A2 and A3 stages), each parameter was checked in comparison of the weighted average. Manufacturer's data represented annual operations inclusive of seasonal and other normal annual fluctuations in operations. All relevant and specific processes were considered and modeled to represent the specified products. The completeness of the data used for A1-A3 is considered high.
Representativeness	The representativeness is good overall. See time-related, geography and technology coverages parameters above.
Consistency	All primary data were collected with the same level of detail (i.e., using consistent data collection templates), while all background data were sourced from the GaBi and Ecoinvent databases. Allocation and other methodological choices were made consistently throughout the model.
Reproducibility	Reproducibility is supported as much as possible through the disclosure of the weighted average inventory, datasets choices, and modeling approaches in this report.

4.3 Allocation

Steel production generates several co-products from coke ovens, the blast furnace, basic oxygen furnace and Electric Arc Furnace (EAF) that are sold to and used by other industries. These include slags, process gases and organic products from coke making. The processes that produce these co-products cannot be further sub-divided into sub-processes related to each co-product, so allocation is required. The allocation method used for this study was developed by the world steel association and EUROFER to be in line with EN 15804 and ISO 21930:2017

standards. The methodology is based on physical allocation and takes account of the manner in which changes in inputs and outputs affect the production of co-products and material flows that carry specific inherent properties. The method is deemed to provide the most representative partitioning of the processes involved.

4.4 Recycling and Disposal

Steel is recyclable and can be recycled repeatedly. In building and construction, steel scrap has a recycling rate of 92% (AISC, n.d). The remaining 8% is sent to landfill (EPA, 2023).

Table 7 Recycling and disposal

Name	Value
Deconstruction	-
Waste processing	-
Disposal to landfill	8%
Recycling rate of the product	92%
Removals of biogenic carbon	n/a

4.5 Life cycle impact assessment - Results

LCIA Results for 1 metric ton (mt) of AD series steel siding are presented in Table 8 to Table 13. LCIA Results for AD series steel sidings are reported separately based on the locations of manufacturing in Ontario (Tables 8-10) and Alberta (Tables 11-13)

Table 8 Results for the environmental impacts for 1 metric ton of AD series steel siding production in Ontario

Environmental Impacts								
Module	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global Warming Potential 100a (IPCC 2013-AR5)								
GWP100 [IPCC 2013]	1.39 E+003	7.92 E+000	2.43 E+001	6.08 E-001	2.15 E+001	2.46 E-001	1.19 E+000	-2.20 E+002
Environmental Impact Indicators (TRACI 2.1)								
AP [kg SO_2 eq]	3.22 E+000	2.25 E-002	1.31 E-001	2.53 E-003	4.21 E-002	1.39 E-003	7.80 E-003	-3.39 E-001
EP [kg N eq]	1.60 E-001	2.35 E-003	2.39 E-002	2.25 E-004	5.04 E-003	9.30 E-005	6.76 E-004	-2.16 E-002
ODP [kg CFC11 eq]	1.03 E-008	1.48 E-014	3.62 E-009	1.10 E-015	3.82 E-014	5.64 E-013	2.16 E-011	-7.15 E-013
SFP [kg O_3 eq]	5.67 E+001	5.12 E-001	2.31 E+000	8.47 E-002	9.54 E-001	1.45 E-002	1.50 E-001	-4.70 E+000
ADP fossil [MJ]	2.05 E+003	1.46 E+001	2.18 E+001	1.09 E+000	3.76 E+001	9.28 E-002	1.93 E+000	-1.47 E+001

Comparability: 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. 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.

Module D Considerations: The values in Module D include a recognition of the benefits or impacts related to steel recycling which occur at the end of the product's service life. The rate of steel recycling and related processes will evolve over time. The results included in module D attempt to capture future benefits, or impacts, but are based on a methodology that uses current industry-average data reflecting current processes.

Table 9 Results for resource use of 1 metric ton of AD series steel siding production in Ontario

Resource Use Flows								
Module	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
NRPRe [MJ]	2.35 E+004	1.10 E+002	6.67 E+002	8.22 E+001	2.84 E+002	2.18 E+001	1.60 E+001	-2.20 E+003
RPRe [MJ]	2.55 E+003	4.29 E+000	1.75 E+003	3.20 E-001	1.10 E+001	1.14 E+001	1.57 E+000	1.39 E+002
NRPRm [MJ]	6.98 E-003	4.10 E-008	1.75 E-006	3.05 E-009	1.05 E-007	1.16 E-008		-5.06 E-004
RPRm [MJ, LHV]	6.17 E+001	8.05 E-011	6.78 E-004	5.99 E-012	2.07 E-010			4.10 E-005
NRSF [MJ]	3.21 E-001						5.98 E-002	
RSF [MJ]	2.67 E-002						2.94 E-002	
RE [MJ]								
FW (m^3)	6.;76 E+000	1.04 E-006	5.80 E-003	7.74 E-008	2.67 E-006	1.56 E-007		-1.49 E+001
SM [kg]	7.20 E+002		1.07 E-001					1.33 E+002

Table 10 Results for waste and output flows of 1 metric ton of AD series steel siding production in Ontario

Waste and Output Flows								
Module	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
MR [kg]	1.69 E-004		1.06 E+001			9.19 E+002		
HWD [kg]	1.83 E-003		1.97 E-002					
NHWD [kg]	7.19 E-004		2.21 E-002			8.00 E+001		
HLRW [kg]	2.23 E-003	3.63 E-007	2.00 E-004	2.70 E-008	9.33 E-007	9.46 E-006	3.33 E-007	2.47 E-007
ILLRW [kg]	3.75 E-002	6.62 E-006	3.35 E-003	4.93 E-007	1.70 E-005	1.58 E-004	5.14 E-006	4.53 E-006
CRU [kg]								
MER [kg]								
EE [MJ]								

Table 11 Results for the environmental impacts of 1 metric ton of AD series steel siding production in Alberta

Environmental Impacts								
Module	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global Warming Potential 100a (IPCC 2013-AR5)								
GWP100 [IPCC 2013]	1.41 E+003	2.42 E+002	1.26 E+001	5.97 E-001	2.00 E+001	2.41 E-001	1.17 E+000	-2.16 E+002
Environmental Impact Indicators (TRACI 2.1)								
AP [kg SO_2 eq]	3.29 E+000	1.13 E+000	1.25 E-001	2.48 E-003	4.13 E-002	1.36 E-003	7.65 E-003	-3.33 E-001
EP [kg N eq]	1.63 E-001	1.00 E-001	4.39 E-002	2.20 E-004	4.95 E-003	9.13 E-005	6.63 E-004	-2.12 E-002
ODP [kg CFC11eq]	1.05 E-008	4.52 E-013	7.28 E-009	1.08 E-015	3.74 E-014	5.54 E-013	2.12 E-011	-7.01 E-013
SFP [kg O_3 eq]	5.68 E+001	2.60 E+001	1.06 E+000	8.31 E-002	9.36 E-001	1.43 E-002	1.47 E-001	-4.62 E+000
ADP fossil [MJ]	2.09 E+003	4.46 E+002	1.04 E+001	1.07 E+000	3.69 E+001	9.11 E-002	1.89 E+000	-1.44 E+001

Table 12 Result for resource use of 1 metric ton of AD series steel siding production in Alberta

Resource Use Flows								
Module	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
NRPRe [MJ]	2.39 E+004	3.37 E+003	1.38 E+002	8.06 E+000	2.79 E+002	2.14 E+001	1.57 E+001	-2.16 E+003
RPRe [MJ]	2.60 E+003	1.31 E+002	6.17 E+002	3.14 E-001	1.08 E+001	1.11 E+001	1.55 E+000	1.36 E+002
NRPRm [MJ]	7.12 E-003	1.25 E-006	6.22 E-007	2.99 E-009	1.03 E-007	1.14 E-008		-4.96 E-004
RPRm [MJ, LHV]	6.30 E+001	2.45 E-009	1.37 E-003	5.88 E-012	2.03 E-010	-3.24 E-011	3.57 E-011	4.02 E-005
NRSF [MJ]	3.28 E-001						5.87 E-002	
RSF [MJ]	2.73 E-002						2.88 E-002	
RE [MJ]								
FW [m^3]	6.90 E+000	3.17 E-005	1.17 E-002	7.59 E-008	2.62 E-006	1.53 E-007		-1.46 E+001
SM [kg]	7.35 E+002		2.15 E-001					1.30 E+002

Table 13 Results for waste and output flows of 1 metric ton of AD series steel siding production in Alberta

Waste and Output Flows								
Module	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
MR [kg]	1.72 E-004		3.09 E+001			9.22 E+002		
HWD [kg]	1.87 E-003		3.97 E-002					
NHWD [kg]	7.34 E-004		4.46 E-002			8.03 E+001		
HLRW [kg]	2.28 E-003	1.11 E-005	3.90 E-006	2.65 E-008	9.16 E-007	9.28 E-006	3.27 E-007	2.42 E-007
ILLRW [kg]	3.83 E-002	2.02 E-004	6.69 E-005	4.84 E-007	1.67 E-005	1.55 E-004	5.04 E-006	4.45 E-006
CRU [kg]								
MER [kg]								
EE [MJ]								

Disclaimer: This Environmental Product Declaration (EPD) conforms to ISO 14025, 14040, ISO 14044, and ISO 21930. These results are only applicable to AD series steel siding produced using ArcelorMittal Dofasco XCarb™ RRP steel.

Scope of results reported: The PCR requires the reporting of a limited set of LCA metrics; therefore, there may be relevant environmental impacts beyond those disclosed by this EPD. The EPD does not indicate that any environmental or social performance benchmarks are met nor thresholds exceeded.

Accuracy of results: This EPD has been developed in accordance with the PCR applicable for the identified product following the principles, requirements and guidelines of the ISO 14040, ISO 14044, ISO 14025 and ISO 21930 standards. The results in this EPD are estimations of potential impacts. The accuracy of results in different EPDs may vary as a result of value choices, background data assumptions and quality of data collected.

Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate and could lead to the erroneous selection of materials or products which are higher impact, at least in some impact categories. Any comparison of EPDs shall be subject to the requirements of ISO 21930. For comparison of EPDs which report different module scopes, such that one EPD includes module D and the other does not, the comparison shall only be made

based on modules A1, A2, and A3. Additionally, when module D is included in the EPDs being compared, all EPDs must use the same methodology for calculation of Module D values.

Statistical distribution of results was not provided in this study because the primary data collection accounted for very small portion of the overall results. The impact results are dominated by secondary datasets, primarily the production of hot dip galvanized coil.

4.6 End of Life Recycling

End of life recycling is one of the most important sustainability attributes for the steel industry and it is essential that the benefits associated with recycling at the end of life be recognized. As a result of a global scrap shortage in the industry, all scrap that is recovered at the end life will offset primary BOF steel production which has significantly larger environmental footprint than secondary EAF steel production route.

Table 14 End of life assumptions for AD series steel siding production

Assumption	Value
End of life recycling rate	92%
Recycled content	77.57%
Reuse at end of life	0%

4.7 Life cycle impact assessment – Interpretation

Global Warming Potential (GWP):

The global warming potential indicator is dominated by the hot dip galvanized steel coil production in which around 90% of the CO_2 emission is associated to the Blast Furnace and by energy production and use all along the production steps. Methane also contributes to a lower extent (6%) to GWP from coal mining and coke making operations.

Acidification Potential (AP):

Sulphur dioxide and nitrogen oxides together contribute most to the acidification potential indicator (90%). They arise primarily from electricity production and transportation.

Eutrophication Potential (EP):

The EP for steel products is dominated by emissions to air, which contribute 94% to this impact. The main contributor is nitrogen oxides (90%). Emissions to water that contribute to this impact are from nitrogen containing substances, e.g. nitrate, ammonia.

Ozone Depletion Potential (ODP):

Ozone layer depletion indicator value is mainly determined by electricity production for high grade zinc refining.

Smog Formation Potential (SFP):

The smog formation potential for steel products is dominated by carbon monoxide coming from the iron ore preparation process which accounts for over 60% of the contribution to this impact. All other major substances contributing to this impact are sulfur dioxide and nitrogen oxides.

ADP fossil:

This indicator is dominated using natural gas and the use of hard coal at the Blast Furnace. The balance is accounted for by the use of crude oil and lignite.

5. Additional environmental information

The electricity used in the steelmaking process is independently verified, with a 'Guarantee of Origin' given that it is from renewable sources. This is ensured by the purchasing of Renewable Energy Certificates (RECs), a market-based offering that certifies the bearer owns a specific amount (in megawatt-hours) of electricity generated from a renewable energy resource. However, to conform with the UL Part A PCR requirements, the environmental benefit associated with the use of RECs is not captured in this EPD.

6. Project Photos





7. Glossary

7.1 Acronyms

AISI – American Iron and Steel Institute

BF – Blast Furnace

BOF – Blast Oxygen Furnace

CSA – Canadian Standard Association

CSI – Construction Specifications Institute

CSSBI – Canadian Sheet Steel Building Institute

EAF – Electric Arc Furnace

EPD - Environmental Product Declaration

GHG – Greenhouse Gas

GWP – Global Warming Potential

HDG – Hot Dip Galvanized

ISO - International Organization for Standardization

IPCC – Intergovernmental Panel on Climate Change

LCA – Life cycle assessment

LCI – Life cycle inventory

LCIA – Life Cycle Impact Assessment

PCR – Product Category Rule

PVDF – Polyvinylidene Difluoride

REC – Renewable Energy Certificate

RRP – Recycled and Renewably Produced

UNSPSC – United Nations Standard Products and Services Code

US EPA – United States Environmental Protection Agency

VOC – Volatile Organic Compounds

7.2 Environmental impact categories and parameters assessed.

Acidification potential (kg SO_2 equivalent): This impact category is expressed in sulphur dioxide equivalents and refers to the change in acidity in soil or water due to the addition of certain

substances (e.g., nitric acid, sulfuric acid and ammonia) which can build or release hydrogen ions (H+) through interactions with the local environment (US EPA, 2012).

Abiotic resource depletion of non-renewable (fossil) energy resources (MJ, net calorific value): This indicator measures the reduction of raw natural resources (e.g., minerals) due to their extraction. It is expressed in units of kg of antimony equivalents according to concentration reserves and rate of de-accumulation. This indicator also refers to the reduction of fossil fuels due to their extraction for consumption and is expressed in megajoules (PRé, 2021).

Eutrophication (kg N equivalent): This impact category measures the enrichment of an ecosystem (i.e., aquatic or terrestrial) due to the release of nutrients (e.g., nitrates, phosphates) which increases biological activity. In an aquatic environment, this activity results in the growth of algae which consume dissolved oxygen present in water when they degrade and thus affect species sensitive to the concentration of dissolved oxygen. This category is expressed in nitrogen equivalents (US EPA, 2012).

Global warming (kg CO_2 equivalent): This indicator refers to the impact of a temperature increase on the global climate patterns due to the release of greenhouse gases (GHG) (e.g., carbon dioxide and methane). GHG emissions contribute to the increase in the absorption of radiation from the sun at the earth's surface. Global warming impact is expressed in units of kg of carbon dioxide equivalents (US EPA, 2012).

Ozone depletion (kg CFC 11 equivalent): This indicator measures the potential of stratospheric ozone level reduction and thus the increase in ultraviolet (UV) radiation causing higher risks to human health (e.g., skin cancers and cataracts). Pollutants that are responsible for this impact are often released by cooling systems (e.g., refrigerants such as chlorofluorocarbons). It is expressed in kg of trichlorofluoromethane equivalents (US EPA, 2012).

Smog (kg O_3 equivalent): This impact category covers the emissions of pollutants such as nitrogen oxides and volatile organic compounds (VOCs) at the ground level ozone. When reacting with the sunlight, these pollutants create smog. It is expressed in kg of ozone equivalents (US EPA, 2012).

Recovered energy (MJ, net calorific value): Energy recovered from disposal of waste in previous systems, such as energy recovery from combustion of landfill gas or energy recovered from other systems using energy sources.

Renewable/non-renewable primary energy (MJ, net calorific value): This parameter refers to the use of energy from renewable resources (e.g., wind, solar, hydro) and non-renewable resources (e.g., natural gas, coal, petroleum).

Renewable/non-renewable secondary fuels (MJ, net calorific value): Inventory of renewable or non-renewable secondary fuels.

Secondary material (kg): Recycled material used to produce a product (ISO, 2020b)

Use of net freshwater resources (m^3): This parameter includes water that is consumed by a system. However, it does not refer to water that is used but returned to the original source (e.g., water for hydroelectric turbines, for cooling or river transportation), or to water lost from a natural system (e.g., due to evaporation of rainwater) (EPD International, 2015).

8. References

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