



Declaration Owner

Algoma Steel Inc.
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Product

Cold Rolled Coil

Declared Unit

The declared unit is one metric ton of cold rolled steel coil

EPD Number and Period of Validity

SCS-EPD-10486
EPD Valid August 26, 2025 through August 25, 2030

Product Category Rule


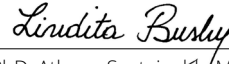
PCR Guidance for Version 4.0. UL Environment. March 2022

PCR Guidance for Building-Related Products and Services. Part B:
Designated Steel Construction Product EPD Requirements. UL
Environment. V.2. August 2020.

Program Operator

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Address:	105 West Street, Sault Ste. Marie, ON P6A 7B4
Declaration Number:	SCS-EPD-10486
Declaration Validity Period:	EPD Valid August 26, 2025 through August 25, 2030
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LCA Practitioner:	Tess Garvey, Ph.D., SCS Global Services
LCA Software and LCI database:	OpenLCA v2.5.0 software and the Ecoinvent v3.11 database
Product RSL:	n/a
Markets of Applicability:	Global
EPD Type:	Product-Specific
EPD Scope:	Cradle-to-Gate
LCIA Method and Version:	TRACI 2.1 and IPCC AR5
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
LCA Reviewer:	 Lindita Bushi, PhD, Athena Sustainable Materials Institute
Part A Product Category Rule:	PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. UL Environment. Version 4.0. March 2022.
PCR Review conducted by:	Lindita Bushi, PhD (Chair); Hugues Imbeault-Tétreault, ing., M.Sc.A.; Jack Geibig
Part B Product Category Rule:	PCR Guidance for Building-Related Products and Services. Part B: Designated Steel Construction Product EPD Requirements. UL Environment. V.2. August 2020.
PCR Review conducted by:	Thomas Gloria, PhD; Brandie Sebastian, James Littlefield
Independent verification of the declaration and data, according to ISO 14025 and the PCR	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
EPD Verifier:	 Lindita Bushi, PhD, Athena Sustainable Materials Institute
Declaration Contents:	<ul style="list-style-type: none"> 1. Algoma 2 2. Product 2 3. LCA: Calculation Rules 6 4. LCA: Scenarios and Additional Technical Information 11 5. LCA: Results 12 6. LCA: Interpretation 15 7. References 16
<p>Disclaimers: <i>This EPD conforms to ISO 14025, 14040, 14044, and ISO 21930.</i></p> <p>Scope of Results Reported: <i>The PCR requirements limit the scope of the LCA metrics such that the results exclude environmental and social performance benchmarks and thresholds, and exclude impacts from the depletion of natural resources, land use ecological impacts, ocean impacts related to greenhouse gas emissions, risks from hazardous wastes and impacts linked to hazardous chemical emissions.</i></p> <p>Accuracy of Results: <i>Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.</i></p> <p>Comparability: <i>The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.</i></p> <p><i>In accordance with ISO 21930:2017, EPDs are comparable only if they comply with the core PCR, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works.</i></p> <p><i>The owner of the declaration shall be liable for the underlying information and evidence; SCS shall not be liable with respect to manufacturer information, life cycle assessment data, and evidence supplied or made available to SCS.</i></p>	

1. Algoma Steel, Inc

With over a century of experience, Algoma Steel has established itself as a trusted partner with their long-running commitment to innovation by investing in the latest technologies in steel production. A proud supplier of high-quality, Canadian-made steel, Algoma's Sault Ste Marie, Ontario facility supports local jobs and infrastructure with durability tailored to North America's climate. The location's fully integrated production of hot and cold-rolled steel sheet and plate products enables responsive and customer-driven product solutions for a wide range of industries including automotive, construction, energy, and defense.

2. Product

2.1 PRODUCT DESCRIPTION

Algoma's cold rolled steel coils are produced by processing hot-rolled sheets through a cold reduction mill which enhances surface finish, dimensional accuracy, and mechanical properties. This makes it ideal for applications demanding precision, smooth surfaces, and tight tolerances. Algoma's coils are available in various thicknesses, sizes and finishes to suit a customer's needs. Surface finish options include matte, bright and brushed finishes.

Table 1. Declared unit for Algoma Cold Rolled Steel Coil and the approximate density.

Parameter	Value
Declared Unit	1 metric ton
Density	7,850 kg/m ³



Figure 1. Algoma Cold Rolled Steel Coils being loaded.

2.2 PRODUCT FLOW DIAGRAM

The flow diagram below illustrates the production processes, and the life cycle phases included in the scope of the EPD.

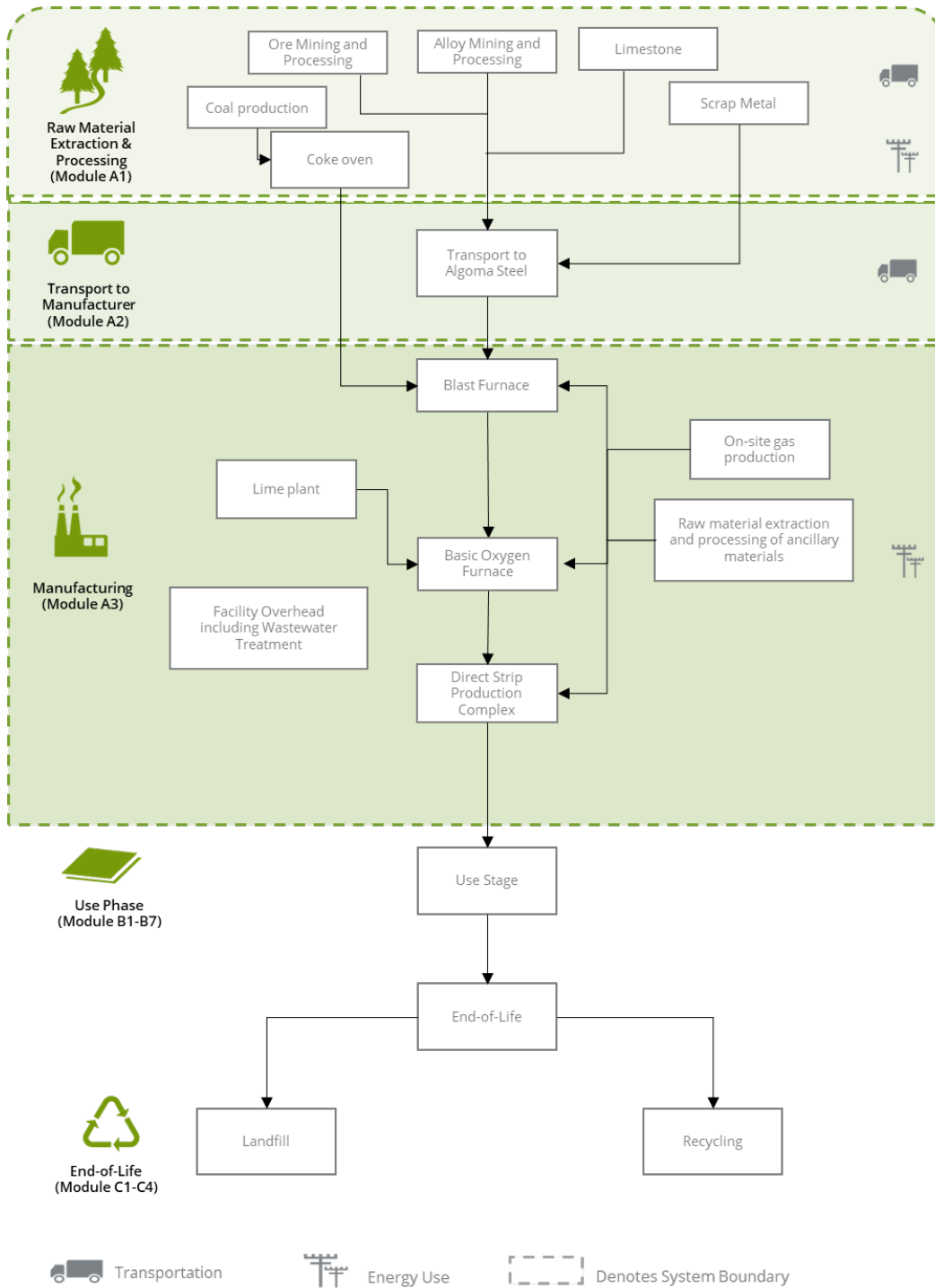


Figure 2. Flow diagram for the life cycle of Algoma Cold Rolled Steel Coil.

2.3 INTENDED APPLICATION

Algoma's cold rolled steel coils can be used for a variety of intended applications, including appliance and consumer goods, furniture, automotive and construction. Examples of uses have included, among others, producing office equipment and roofs.

2.4 DECLARATION OF METHODOLOGICAL FRAMEWORK

The scope of the EPD is cradle-to-gate, including raw material extraction and processing, transportation, and product manufacture. The life cycle phases included in the product system boundary are shown below. Cut-off and allocation procedures are described below and conform to the PCR and ISO standards.

Table 2. Life cycle phases included in the product system boundary.

Product			Construction Process		Use							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material extraction and processing	Transport to manufacturer	Manufacturing	Transport	Construction - installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery and/or recycling potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X = Module Included | MND = Module Not Declared

2.5 TECHNICAL DATA

A summary of technical specifications for the cold rolled steel coils included in scope are listed in Table 3.

Table 3. Technical specifications for Cold Rolled Steel coils

Product	ASTM Standards	Sub-Product	Range of Nominal Gauges in (mm)	Standard Widths in (mm)
Cold Rolled Coil	A1008	SAE 1006/1008 Commercial Steel	0.02 (0.51) – 0.133 (3.37)	30 (762), 36 (915), 42 (1,067), 48 (1,219), 54 (1,372), 60 (1,524), 66 (1,676), 72 (1,828)
Cold Rolled Coil	A1008	SAE 1006/1008 Drawing Steel & Severe Forming Application	0.02 (0.51) – 0.115 (2.91)	30 (762), 36 (915), 42 (1,067), 48 (1,219), 54 (1,372), 60 (1,524), 66 (1,676), 72 (1,828)
Cold Rolled Coil	A1008	SAE 1010/1017 Commercial Steel	0.02 (0.51) – 0.121 (3.06)	30 (762), 36 (915), 42 (1,067), 48 (1,219), 54 (1,372), 60 (1,524), 66 (1,676), 72 (1,828)
Cold Rolled Coil	A1008	SAE 1018/1022 Drawing Commercial Steel	0.025 (0.64) – 0.064 (1.62)	30 (762), 36 (915), 42 (1,067), 48 (1,219), 51 (1,295)

2.6 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

Algoma cold rolled steel coils are custom-made for every project and are delivered in a variety of sizes-widths. Table 3 above covers sizing specifications for the Algoma Steel cold rolled coil products.

2.7 MATERIAL COMPOSITION

The steel is made from virgin iron ore, secondary materials, and an alloy content lower than 5%. The material composition in the year of data modeled were 73.6% primary iron, 8.4% external recycled material, 13.3% internally-produced scrap and secondary material, 3.1% cold pig iron, and 1.6% alloy materials.

Under normal conditions Algoma cold rolled steel coils do not present inhalation, ingestion, or contact health hazards including but not limited to indoor air emissions, gamma or ionizing radiation emissions, or chemicals released to air or leached to water or soil. However, operations such as welding, grinding, sawing and burning, which may cause airborne particulates or fume formation, may present a health hazard.

In conformance with the PCR, product materials were reviewed for the presence of any toxic or hazardous chemicals. Based on a review of the product components provided by the manufacturer, no regulated chemicals are expected to be released to the environment.

2.8 MANUFACTURING

The processes in scope for this study at the Algoma facility consist of one blast furnace, a basic oxygen furnace, and a direct strip production complex and a cold mill complex. Electricity and steam are produced on-site and are used throughout the Algoma facilities. A lime plant operates to process limestone into high quality lime products used within the steelmaking operations. Additionally, wastewater treatment operations occur on-site. Primary data was collected from Algoma for all production processes from a collection period spanning January 1st, 2022, to December 31, 2022.

The electricity mix for each of the Algoma Steel operations and facilities are modeled using the data collected for the powerhouse, which produces steam and electricity from blast furnace gas, coke oven gas, grid electricity and natural gas. The grid electricity used in the powerhouse is modeled using the province-specific Ecoinvent electricity grid for Canada (Ontario). No CO2 certificates are included in this LCA.

2.9 FURTHER INFORMATION

Further information on the product can be found on the manufacturer's website: www.algoma.com



Figure 3. Algoma Steel Coils.

3. LCA: Calculation Rules

3.1 DECLARED UNIT

The declared unit used in the study is one (1) metric ton of cold rolled steel coils, consistent with the PCR.

The cold rolled steel coils produced by Algoma are custom-made products for specific projects, and therefore the raw material composition may change depending on the project. An average product is modeled, representing one metric ton of cold rolled steel coils.

3.2 SYSTEM BOUNDARY

The scope of the EPD is cradle-to-gate, including raw material extraction and processing, transportation, and product manufacture. The construction process stage, use stage, end-of-life stage, and Module D of the product are excluded from the system boundaries of this study. Additional elements that are excluded from the study are capital equipment and infrastructure. The life cycle phases included in the EPD scope are described in Table 4.

Table 4. *The modules and unit processes included in the scope for Cold Rolled Steel Coils.*

Module	Module Description	Unit Processes Included in Scope
A1	Extraction and processing of raw materials; any reuse of products or materials from previous product systems; processing of secondary materials; generation of electricity from primary energy resources; energy, or other, recovery processes from secondary fuels	Raw material extraction and processing for the raw materials upstream of the Algoma facility. Ore mining and processing, alloy mining and processing, limestone processing and coal production are included in scope of this study.
A2	Transport (to the manufacturer)	Transportation of component materials from upstream manufacture to the Algoma facility in Sault Ste Marie, Ontario.
A3	Manufacturing, including packaging and ancillary material production	Manufacture and fabrication at the Algoma facility in Sault Ste Marie, Ontario for the cold rolled steel coils, ancillary materials, lime production, on-site electricity production and waste water treatment.
A4	Transport (to the building site)	Module Not Declared
A5	Construction-installation process	Module Not Declared
B1	Product use	Module Not Declared
B2	Product maintenance	Module Not Declared
B3	Product repair	Module Not Declared
B4	Product replacement	Module Not Declared
B5	Product refurbishment	Module Not Declared
B6	Operational energy use by technical building systems	Module Not Declared
B7	Operational water uses by technical building systems	Module Not Declared
C1	Deconstruction, demolition	Module Not Declared
C2	Transport (to waste processing)	Module Not Declared
C3	Waste processing for reuse, recovery and/or recycling	Module Not Declared
C4	Disposal	Module Not Declared
D	Reuse-recovery-recycling potential	Module Not Declared

3.3 UNITS

All data and results are presented using SI units.

3.4 ESTIMATES AND ASSUMPTIONS

The assessment relied on several assumptions. The major assumptions used in the assessment are described below.

- Compressed air production is produced on-site, and electricity used by compressors is modeled and allocated to compressed air used within the steel mills.
- A third-party operates gas production (argon, nitrogen and oxygen) on-site at Algoma. The electricity use for gas production was provided, as well as the the production and distribution of gases within the Algoma processes. Electricity use was allocated to the gas production based on volume.
- Water use and Wastewater treatment was allocated to the overhead of the facility, as it was not possible to separate out between processes on-site.
- For purchased electricity from the grid, the Ecoinvent dataset for electricity from the respective Canadian province, Ontario, was selected and use. This grid mix is based upon statistics from the Government of Canada - Statistics Canada (StatCAN) for 2022.
- Disposal of some manufacturing wastes were modeled within overhead.

3.5 CUT-OFF RULES

According to the PCR, processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No data gaps were allowed which were expected to significantly affect the outcome of the indicator results. No known flows are deliberately excluded from this EPD.

3.6 DATA SOURCES

Primary data were provided by Algoma for their manufacturing facility in Sault Ste Marie, Ontario. The sources of secondary LCI data are the Ecoinvent database.

Table 5. LCI datasets and associated databases used to model raw material processing, transport and product manufacturing for the Algoma Cold Rolled Steel Coils.

Flow	Dataset	Data Source	Publication Date
Raw Materials			
Coke oven			
External coal	hard coal mine operation and hard coal preparation hard coal Cutoff, U - RNA	Ecoinvent 3.11	2024
Blast furnace			
Internal Coke	Algoma coke oven model	--	--
External coke	coke production coke Cutoff, U - US	Ecoinvent 3.11	2024
Iron pellet	iron pellet production iron pellet Cutoff, U - RoW	Ecoinvent 3.11	2024
Limestone (external)	market for limestone, milled, loose limestone, milled, loose Cutoff, U - RoW	Ecoinvent 3.11	2024
Natural gas (raw material)	market for natural gas, high pressure natural gas, high pressure Cutoff, U - CA	Ecoinvent 3.11	2024
Basic oxygen furnace/ Alloys			
Copper	market for copper, cathode copper, cathode Cutoff, U - GLO	Ecoinvent 3.11	2024
Ferroboron	boric oxide production boric oxide Cutoff, U - GLO	Ecoinvent 3.11	2024
Ferrochrome	ferrochromium production, high-carbon, 68% Cr ferrochromium, high-carbon, 68% Cr Cutoff, U - RoW	Ecoinvent 3.11	2024
Ferromanganese	ferromanganese production, high-coal, 74.5% Mn ferromanganese, high-coal, 74.5% Mn Cutoff, U - RER	Ecoinvent 3.11	2024
Manganese	manganese production manganese Cutoff, U - RER	Ecoinvent 3.11	2024
Ferroniobium	market for ferroniobium, 66% Nb ferroniobium, 66% Nb Cutoff, U - GLO	Ecoinvent 3.11	2024
Ferrosilicon	market for ferrosilicon ferrosilicon Cutoff, U - GLO	Ecoinvent 3.11	2024
Ferromolybdenum	market for molybdenum trioxide molybdenum trioxide Cutoff, U - GLO	Ecoinvent 3.11	2024
Nickel	market for nickel, class 1 nickel, class 1 Cutoff, U - GLO	Ecoinvent 3.11	2024
Ferrotitanium	titanium production titanium Cutoff, U - GLO	Ecoinvent 3.11	2024
Primary aluminum	market for aluminium, primary, ingot aluminium, primary, ingot Cutoff, U - IAI Area, North America	Ecoinvent 3.11	2024
Calcium carbide	calcium carbide production, technical grade calcium carbide, technical grade Cutoff, U - RER	Ecoinvent 3.11	2024
External scrap	sorting and pressing of iron scrap iron scrap, sorted, pressed Cutoff, U - RER	Ecoinvent 3.11	2024
Ferrophosphorus	market for phosphoric acid, fertiliser grade, without water, in 70% solution state phosphoric acid, fertiliser grade, without water, in 70% solution state Cutoff, U - RoW	Ecoinvent 3.11	2024
Quicklime	market for quicklime, milled, loose quicklime, milled, loose Cutoff, U - RoW	Ecoinvent 3.11	2024
Dolomitic lime	dolomite production dolomite Cutoff, U - RER	Ecoinvent 3.11	2024
Lime plant			
Dolomitic limestone	dolomite production dolomite Cutoff, U - RER	Ecoinvent 3.11	2024
Limestone	market for limestone, crushed, washed limestone, crushed, washed Cutoff, U - CH	Ecoinvent 3.11	2024
Rock salt	sodium chloride production, brine solution sodium chloride, brine solution Cutoff, U - RER	Ecoinvent 3.11	2024
<i>Additional ancillary materials as below</i>			
Ancillary – Across Products			
Gases- argon, nitrogen and oxygen	<i>Primary data : electricity production allocated to gas production</i>	--	--
Compressed air	Electricity use allocated to air compression		
Refractory materials	market for refractory, basic, packed refractory, basic, packed Cutoff, U - GLO	Ecoinvent 3.11	2024
	market for refractory, high aluminium oxide, packed refractory, high aluminium oxide, packed Cutoff, U - GLO		
Lubricating oils	lubricating oil production lubricating oil Cutoff, U - RER	Ecoinvent 3.11	2024
Various materials and chemicals based on SDS	sodium chloride production, brine solution sodium chloride, brine solution Cutoff, U - RER	Ecoinvent 3.11	2024
	market for silica sand silica sand Cutoff, U - GLO	Ecoinvent 3.11	2024
	market for sand sand Cutoff, U - RoW		
	market for sodium hydroxide, without water, in 50% solution state sodium hydroxide, without water, in 50% solution state Cutoff, U - RER	Ecoinvent 3.11	2024
	market for bleach bleach Cutoff, U - RER	Ecoinvent 3.11	2024

Flow	Dataset	Data Source	Publication Date
	market for phosphoric acid, fertiliser grade, without water, in 70% solution state phosphoric acid, fertiliser grade, without water, in 70% solution state Cutoff, U - RoW	Ecoinvent 3.11	2024
	market for rape seed rape seed Cutoff, U - RoW	Ecoinvent 3.11	2024
	hard coal mine operation and hard coal preparation hard coal Cutoff, U - RNA	Ecoinvent 3.11	2024
	market for diethylene glycol diethylene glycol Cutoff, U - RER	Ecoinvent 3.11	2024
	market for organophosphorus-compound, unspecified organophosphorus-compound, unspecified Cutoff, U - GLO	Ecoinvent 3.11	2024
DSPC			
Mold powder	magnesium oxide production magnesium oxide Cutoff, U - RER	Ecoinvent 3.11	2024
Tundish powder	soda production, solvay process soda ash, light Cutoff, U - RER	Ecoinvent 3.11	2024
<i>Refractories, phosphoric acid, sodium hydroxide, lubricating oil, etc. as above</i>			
Cold Mill			
Hydrochloric acid	market for hydrochloric acid, without water, in 30% solution state hydrochloric acid, without water, in 30% solution state Cutoff, U - RER	Ecoinvent 3.11	2024
Soda ash	soda production, solvay process soda ash, light Cutoff, U - RER	Ecoinvent 3.11	2024
	chlorine production, liquid chlorine, liquid Cutoff, U - RER		
Various chemicals, based on SDS	citric acid production citric acid Cutoff, S - RNA	Ecoinvent 3.11	2024
	market for potassium hydroxide potassium hydroxide Cutoff, U - GLO		
<i>Additional ancillary materials as above</i>			
Fuels (Across Operations)			
	market for electricity, medium voltage electricity, medium voltage Cutoff, U - CA-ON		
Electricity and Steam from Powerhouse	market for natural gas, high pressure natural gas, high pressure Cutoff, U - CA <i>Air emissions per primary data.</i> <i>Blast furnace and coke oven gas per primary data</i>	Ecoinvent 3.11	2024
Natural gas	market for natural gas, high pressure natural gas, high pressure Cutoff, U - CA	Ecoinvent 3.11	2024
Diesel	diesel, burned in building machine diesel, burned in building machine Cutoff, U - GLO	Ecoinvent 3.11	2024
Gasoline	petrol, unleaded, burned in machinery petrol, unleaded, burned in machinery Cutoff, U - GLO	Ecoinvent 3.11	2024
Propane	propane, burned in building machine propane, burned in building machine Cutoff, U - GLO	Ecoinvent 3.11	2024
Transportation			
Rail	market for transport, freight, train, fleet average transport, freight, train, fleet average Cutoff, U - US	Ecoinvent 3.11	2024
Road	transport, freight, lorry, 16-32 metric ton, diesel, EURO 4 transport, freight, lorry, 16-32 metric ton, diesel, EURO 4 Cutoff, U - RER	Ecoinvent 3.11	2024
Inland water transport	transport, freight, inland waterways, barge, diesel transport, freight, inland waterways, barge, diesel Cutoff, U - RER	Ecoinvent 3.11	2024
Wastewater treatment - ancillary materials			
Carbon dioxide	market for carbon dioxide, liquid carbon dioxide, liquid Cutoff, U - RER	Ecoinvent 3.11	2024
WWTP - gravel	market for gravel, round gravel, round Cutoff, U - CH	Ecoinvent 3.11	2024
Chemical - Based on SDS	market for isopropanol isopropanol Cutoff, U - RER	Ecoinvent 3.11	2024
	market for naphtha naphtha Cutoff, U - RER	Ecoinvent 3.11	2024
Fine salt	market for salt salt Cutoff, U - GLO	Ecoinvent 3.11	2024
Waste treatment			
Landfill general	process-specific burdens, inert material landfill process-specific burdens, inert material landfill Cutoff, U - RoW	Ecoinvent 3.11	2024
Dust treatment	treatment of basic oxygen furnace dust, residual material landfill basic oxygen furnace dust Cutoff, U - GLO	Ecoinvent 3.11	2024
Sludge treatment	treatment of basic oxygen furnace sludge, residual material landfill basic oxygen furnace sludge Cutoff, U - GLO	Ecoinvent 3.11	2024
Waste pickle liquor	market for waste mineral oil waste mineral oil Cutoff, U - Europe without Switzerland	Ecoinvent 3.11	2024

3.7 DATA QUALITY

The data quality assessment addresses the following parameters: time-related coverage, geographical coverage, technological coverage, precision, completeness, representativeness, consistency, reproducibility, sources of data, and uncertainty.

Table 6. Data quality assessment for the product system.

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	The most recent available data are used, based on other considerations such as data quality and similarity to the actual operations. Typically, these data are less than 10 years old (typically 2019 or more recent). All of the data used represented an average of at least one year's worth of data collection. Manufacturer-supplied data (primary data) is based on a full year of operations at the Algoma facility from January 1, 2022 - December 31, 2022.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Actual processes for upstream operations are primarily North American. Surrogate data used in the assessment are representative of North American operations. Data representative of European operations are considered sufficiently similar to actual processes. Data representing disposal practices are based on regional statistics.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations.
Precision: Measure of the variability of the data values for each data expressed	Precision of results are not quantified due to a lack of data. Data collected for operations were typically averaged for one or more years and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	The LCA model included all known mass and energy flows for the production of cold rolled steel coils. In some instances, surrogate data used to represent upstream and downstream operations may be missing some data which is propagated in the model. No known processes or activities contributing to more than 1% of the total environmental impact for each indicator are excluded.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represent typical or average processes as currently reported from multiple data sources and are therefore generally representative of the range of actual processes and technologies for production of these materials. Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed data collection throughout the supply chain back to resource extraction. For supplier information, the most representative source of data possible was chosen or modeled.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used with a bias towards Ecoinvent v3.11 data. Different portions of the product life cycle are equally considered; however, it must be noted that final disposition of the product is based on assumptions of current average practices in Europe and North America.
Reproducibility: Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	Based on the description of data and assumptions used, this assessment would be reproducible by other practitioners with access to the primary data. All assumptions, models, and data sources are documented.
Sources of the Data: Description of all primary and secondary data sources	Data representing energy use at the Algoma manufacturing facilities represent an annual average and are considered of high quality due to the length of time over which these data are collected, as compared to a snapshot that may not accurately reflect fluctuations in production. The Ecoinvent database is used for secondary LCI datasets. The other EPD data are also considered high quality due to the fact that they similarly span a full calendar year and are representative of the materials.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the products is low. Actual supplier data for upstream operations was not available for all suppliers and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years) but lacked geographical representativeness. Uncertainty related to the impact assessment methods used in the study are high. The impact assessment method required by the PCR includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

3.8 PERIOD UNDER REVIEW

The period of review for the primary data is from January 1st, 2022, to December 31, 2022.

3.9 ALLOCATION

This study follows the allocation guidelines of ISO 14044 and allocation rules specified in the PCR and minimizes the use of allocation wherever possible. This LCA follows the attributional LCA approach.

Per the worldsteel allocation guidance, blast furnace slag and basic oxygen furnace slag are considered co-products within their respective processes. All other materials are considered by-products and not allocated any impacts. For the blast furnace and BOF processes, the slag is allocated a portion of the shared materials, resource use (e.g., electricity, natural gas, water), waste/byproducts, and emissions released, on based on the amount of energy required to heat steel and slag. The allocation factors were derived from actual slag production within the Algoma processes using the equations provided in the worldsteel guidance.

Elsewhere, primary data for resource use (e.g., electricity, natural gas, water), waste/byproducts, and emissions released are allocated on a mass basis as a fraction of total annual production of each steel product and co-products.

With respect to the steel scrap, the 100-0 recycled content approach is used in which the recycled material bears only the burden of any processing from waste material.

Transportation from the primary producer of material components to the manufacturing facility is based on primary data provided by Algoma, including modes, distances, and amount of material transported. Transportation was allocated on the basis of the mass and distance the material was transported.

3.10 COMPARABILITY

The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.

4. LCA: Scenarios and Additional Technical Information

Manufacturing

This stage includes all the on-site steelmaking and processing steps including Blast Furnace, Basic Oxygen Furnace (BOF), the Direct Strip Production Complex (DSPC), a continuous casting and rolling mill that produces hot-rolled sheet steel directly from liquid steel, and a cold mill complex where the steel is annealed and cold rolled. Other processes such as lime production and wastewater treatment are also included in scope. Production of capital goods, infrastructure, manufacturing equipment, and personnel-related activities are not included. The grid electricity used in the powerhouse is modeled using the province-specific Ecoinvent electricity grid for Canada (Ontario).

Transportation for waste materials at the manufacturing facility assumes a 20 miles (~32 km) average distance to disposal, consistent with assumptions used in the EPA WARM model. Based on statistics for solid waste generation and disposal in Canada, the model assumes 80% of non-hazardous wastes are disposed in landfill and 20% incinerated.

5. LCA: Results

Results of the Life Cycle Assessment are presented below. The following environmental impact category indicators are reported using characterization factors based on the TRACI 2.1, IPCC AR5 and CML-IA impact assessment methods. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

All LCA results are stated to three significant figures in agreement with the PCR for this product.

Table 7. Nomenclature and reporting units for LCIA impact category indicators.

TRACI 2.1 Impact Category	Unit	IPCC AR5	Unit
Global Warming Potential (GWP)	kg CO ₂ eq	Global Warming Potential (GWP)	kg CO ₂ eq
Ozone Depletion Potential (ODP)	kg CFC 11 eq	CML-IA Impact Category	Unit
Acidification Potential (AP)	kg SO ₂ eq	Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, LHV
Eutrophication Potential (EP)	kg N eq	-	-
Smog Formation Potential (SFP)	kg O ₃ eq	-	-
Fossil Fuel Depletion Potential (FFD)	MJ Surplus, LHV	-	-

The following inventory parameters, specified by the PCR, are also reported.

Table 8. Nomenclature and reporting units for resource use and waste flows.

Parameter	Units
RESOURCES	
Use of renewable primary resources used as an energy carrier (RPR _E)	MJ, LHV
Use of renewable primary resources used as material (RPR _M)	MJ, LHV
Non-renewable primary resources used as an energy carrier (NRPR _E)	MJ, LHV
Non-renewable primary resources used as material (NRPR _M)	MJ, LHV
Secondary materials (SM)	mt
Renewable secondary fuels (RSF)	MJ, LHV
Non-renewable secondary fuels (NRSF)	MJ, LHV
Recovered energy (RE)	MJ, LHV
Use of net freshwater resources (FW)	m ³
WASTES	
Non-hazardous waste disposed (NHWD)	kg
Hazardous waste disposed (NWD)	kg
High-level radioactive waste (HLRW)	kg
Intermediate- and low-level radioactive waste (ILLRW)	kg
Components for re-use (CRU)	kg
Materials for recycling (MR)	kg
Materials for energy recovery (MER)	kg
Recovered energy exported from the product system (EE)	MJ, LHV

Table 9. Life Cycle Impact Assessment results by life cycle phase for the declared unit (metric ton) of Cold Rolled Steel Coil. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Total (A1-A3)
IPCC AR5				
Global Warming Potential (kg CO ₂ eq)	596	64.6	2,240	2,900
	21%	2%	77%	100%
TRACI 2.1				
Global Warming Potential (kg CO ₂ eq)	579	63.6	2,230	2,880
	20%	2%	78%	100%
Ozone Depletion Potential (kg CFC-11 eq)	1.77x10 ⁻⁵	1.06x10 ⁻⁶	5.86x10 ⁻⁶	2.47x10 ⁻⁵
	72%	4%	24%	100%
Acidification Potential (kg SO ₂ eq)	2.51	0.476	1.57	4.56
	55%	10%	35%	100%
Eutrophication Potential (kg N eq)	0.662	6.10x10 ⁻³	0.0351	0.703
	94%	1%	5%	100%
Smog Formation Potential (kg O ₃ eq)	34.3	14.4	26.3	74.9
	46%	19%	35%	100%
Fossil Fuel Depletion (MJ surplus)	885	111	1304.7	2,300
	38%	5%	57%	100%
CML-IA				
Abiotic Depletion Potential, FF (MJ)	16,100	797	8,100	25,000
	64%	3%	32%	100%

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.

Table 10. Resource use and waste flows per declared unit (metric ton) of Cold Rolled Steel Coils. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.

Parameter	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Total (A1-A3)
RESOURCES				
Renewable primary resources used as energy carrier (RPR _E) (MJ)	581	20.9	619	1,220
	48%	1.71%	51%	100%
Renewable primary resources used as material (RPR _M) (MJ)	0.00	0.00	0.00	0.00
	N/A	N/A	N/A	N/A
Non-renewable primary resources used as an energy carrier (NRPR _E) (MJ)	4,990	822	10,900	16,800
	30%	4.90%	65%	100%
Non-renewable primary resources used as material (NRPR _M) (MJ)	11,600	0.00	0.00	11,600
	100%	0.00%	0.00%	100%
Secondary materials (SM) (metric ton)	0.253	0.00	0.00	0.253
	100%	0.00%	0.00%	100%
Renewable secondary fuels/ Nonrenewable secondary fuels (RSF/NRSF) (MJ)	0.00	0.00	0.00	0.00
Recovered energy (MJ)	0.00	0.00	0.00	0.00
Use of net freshwater resources (FW) (m ³)	2.97	0.138	62.9	66.0
	4.5%	0.21%	95.3%	100%
WASTES				
Non-hazardous waste disposed (NHWD) (kg)	0.00	0.00	56.3	56.3
	0.0%	0.0%	100%	100%
Hazardous waste disposed (HWD) (kg)	0.00	0.00	15.4	15.4
	0.0%	0.0%	100%	100%
High-level radioactive waste (HLRW) (kg)	0.00	0.00	0.00	0.00
	N/A	N/A	N/A	N/A
Low-level radioactive waste (ILLRW) (kg)	0.00	0.00	0.00	0.00
	N/A	N/A	N/A	N/A
Components for Reuse (CRU) (kg)	0.00	0.00	0.00	0.00
Materials for Recycling (MR) (kg)	0.00	0.00	97.2	97.2
	0.0%	0.0%	100%	100%
Materials for Energy Recovery (MER) (kg)	0.00	0.00	0.00	0.00
Exported Energy (EE) (MJ)	0.00	0.00	0.00	0.00

Additionally, the PCR requires the calculation of carbon emissions and removals. No biogenic materials are used in the product system, and as such carbon emissions and removals associated with each products are 0.0 kg per declared unit.

6. LCA: Interpretation

LCIA results were assessed relative to the production of 1 metric ton of cold rolled steel coils, and the impact category indicator results are presented in Section 5. The indicator results when considered across all life cycle stages indicate that the upstream materials production is the most significant contributor to results (Module A1) for cold rolled steel coils. The exception to this are the Global Warming Potential (GWP) and Fossil Fuel Depletion (FFD) results, which are dominated by the manufacturing stage (A3).

The BF operations contribute 22% of the Total (A1-A3) GHG impacts, while the Cold Mill, BOF and DSPC contribute 17, 15 and 14% of the impacts, respectively. The impacts within the Cold Mill are driven by the production of gases by the third-party vendor.

Limitations

As a result of the choice of study scope and LCIA methodologies used, there are several important study limitations which should be understood to ensure an appropriate interpretation of results, as described below.

Limitations in the Study Scope

Primary data of material components was not available for some raw materials upstream of Algoma. Secondary data consists ofecoinvent datasets.

Comparability of EPDs is limited to those applying a functional unit. 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

7. References

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