

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 AND ISO 21930:2017

SmartEPD-2025-063-0473-01

HSS Tube and Pipe



Date of Issue:	Expiration:	Last updated:
Apr 23, 2025	Apr 23, 2030	Aug 25, 2026

Refer to the EPD Library at www.smartepd.com for the latest EPD listing information



General Information

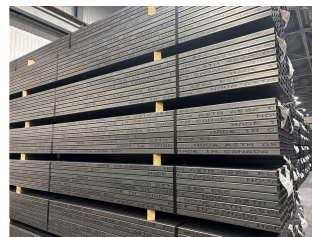
Nova Tube, Inc.

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🌐 novasteel.ca



Product Name:	HSS Tube and Pipe
Declared Unit:	1 metric ton of steel construction product
Declaration Number:	SmartEPD-2025-063-0473-01
Date of Issue:	April 23, 2025
Expiration:	April 23, 2030
Last updated:	August 25, 2026
EPD Scope:	Cradle to gate A1 - A3
Market(s) of Applicability:	North America

General Organization Information

Nova Tube, Inc. (Nova Tube) is a supplier of hollow structural steel (HSS) tube and pipe products, that are used in industrial buildings, construction, infrastructure applications, fire protection, plumbing, water well casing, and fluid lines.

Further information can be found at: <https://novasteel.ca/structural-tube-and-pipe/>

Limitations, Liability and Ownership

Comparison of the environmental performance of construction works and construction products using EPD information shall be based on the product's use and impacts at the construction works level. In general, EPDs may not be used for comparability purposes when not considered in a construction works context. Given this PCR ensures products meet the same functional requirements, comparability is permissible provided the information given for such comparison is transparent and the limitations of comparability explained. When comparing EPDs created using this PCR, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to different results for upstream or downstream of the life cycle stages declared.

Reference Standards

Standard(s):	ISO 14025:2006 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: Designated Steel Construction Products v.2 Date of issue: December 31, 2020 Valid until: December 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:

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Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:

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External

Independent external verification of EPD, according to ISO 14025 and reference PCR(s):

 Lucas Pedro Berman |  Senda - Consultoria Ambiental & Energetica
 info@sendaconsultorias.com

External

Product Information

Declared Unit:

1 metric ton of steel construction product

Mass:

1000 kg

Product Specificity:

 Product Average
 Product Specific

Product Description

The HSS tube and pipe products analyzed in this study are made of mainly carbon steel with a small percentage of alloy elements and paints included. The product has a density of approximately 7,850 kg/m³. Nova Tube's HSS tube and pipe products are typically produced by cold-forming and welding processes to form round, square, or rectangular shapes with various dimensions and lengths. HSS are typically used in buildings, and other structures.

Further information can be found at: <https://novasteel.ca/structural-tube-and-pipe/>

Product Specifications

Product Classification Codes:

UNSPSC - 30104000
EC3 - Steel -> StructuralSteel -> HollowSections

Form Factor:

Steel >> StructuralSteel >> HollowSections

Steel Type:

Carbon

Material Composition

Material/Component Category	Origin	% Mass
Steel	North America	95-99
Alloy	North America	1-5

Packaging Material	Origin	kg Mass
Wood Dunnage	North America	0.21489
Plastic Sheeting	North America	0.19193
Steel Strapping	North America	2.11843
Strapping Seals	North America	0.07623

Biogenic Carbon Content	kg C per metric ton
Biogenic carbon content in product	0
Biogenic carbon content in accompanying packaging	None

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

- Primary Data Year:2023
- Manufacturing Specificity:

✗ Industry Average

✓ Manufacturer Average

✓ Facility Specific

Averaging:
This product-specific EPD was developed based on primary annual manufacturing data for Nova Tube HSS tube and pipe products. The EPD presents facility-specific results for three separate facilities. No averaging across facilities was required. Production-weighted average results are also presented based on calendar year 2023 production percentages (St. Patrick 45.3%, Baie-d'Urfè 27.3%, Ohio 27.4%).

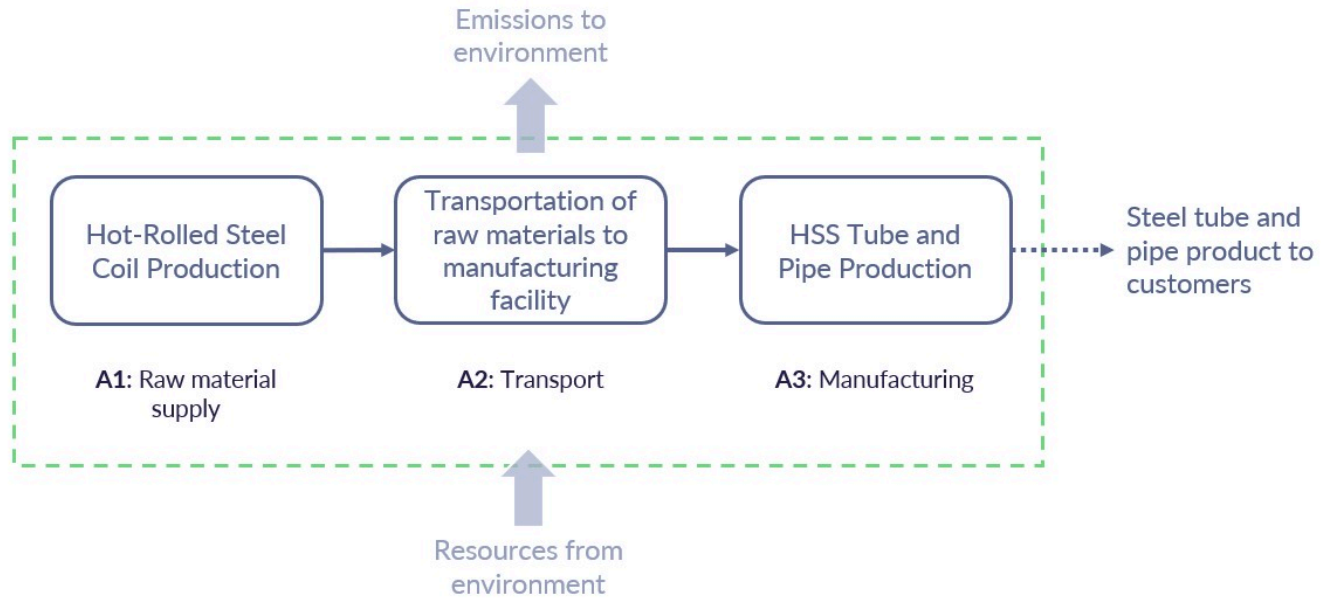
System Boundary

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

Note:

ND = Module not declared

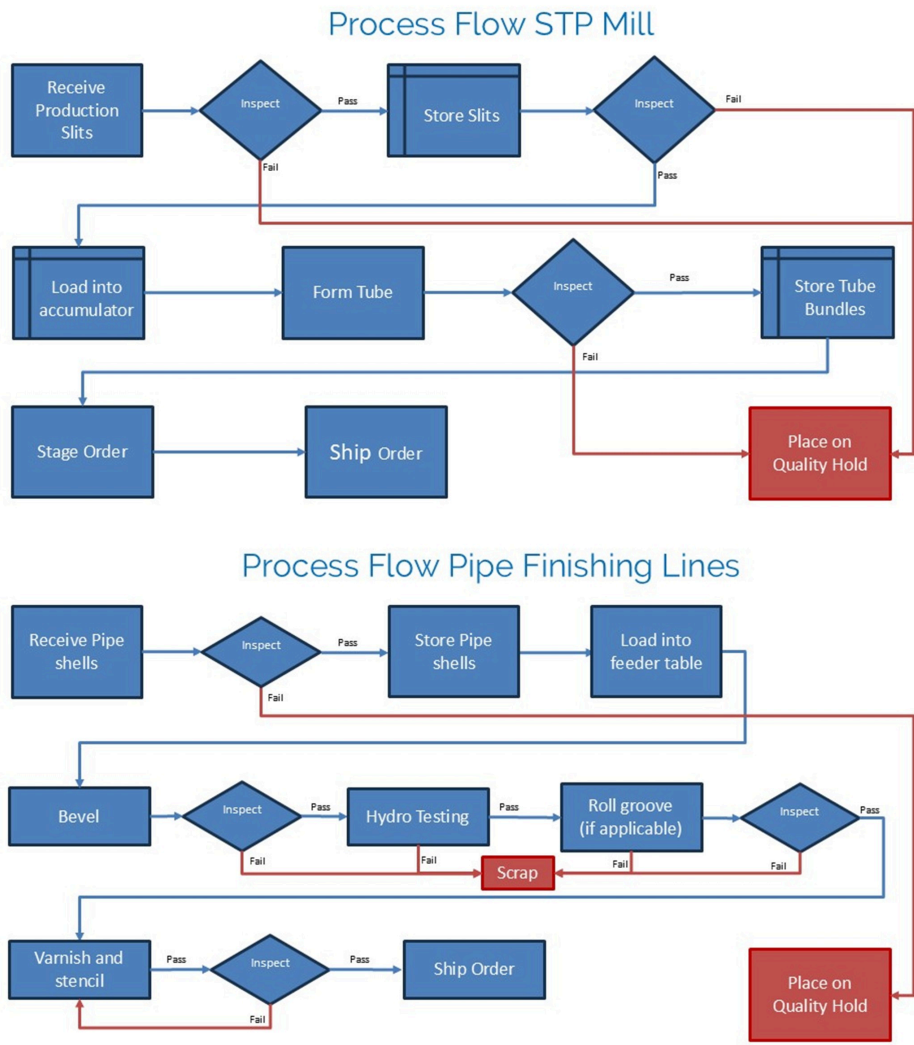
Product Composition Diagram



Plants

-  St. Patrick 5870 Saint-Patrick St., Montreal, Quebec H4E 1S8, Canada
-  Baie-D'Urfe 19460 Clark Graham Ave, Baie-D'Urfe, Quebec H9X 3R8, Canada
-  Delta, Ohio 8641 Co Rd H, Delta, OH 43515, USA

Product Flow Diagram



Software And Database

LCA Software:

LCI Foreground Database(s):

LCI Background Database(s):

 openLCA v. 2.0

 Ecoinvent v. 3.10

 Ecoinvent v. 3.10

 North America, Row, Global

 North America, Row, Global

 Cut-off system models

 Cut-off system models

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

The key requirement for data quality is that data be as accurate and representative as possible. Data quality evaluations are conducted based on the ISO 14044:2006 standard. To fulfill these requirements and to ensure reliable results, primary data in combination with representative, secondary literature and consistent background LCI information from ecoinvent (v3.10) were used.

Life Cycle Module Description

A1 represents the hot-rolled steel coil raw material (including the electricity demand for slitting the coils at the Baie-d'Urfè and St. Patrick facilities), A2 represents the transport of raw materials to the manufacturing facilities, and A3 represents the HSS and pipe manufacturing processes.

LCA Discussion

Allocation Procedure

No multi-output allocation was required in the foreground system, as no co-products are produced. Regarding the steel scrap generated at the A3 stage, the cut-off method was used, assigning no burden or credits to the recycled scrap. Upstream data sources, including supplier-specific EPDs and AISI data, applied a physical allocation approach for steel coil input. No end-of-life allocation was defined as end-of-life treatment is outside of the system boundary. Background data for the study used a cut-off approach for end-of-life allocation.

Cut-off Procedure

No cut-off criteria were defined for this analysis. All known energy and material flow data were included in accordance with the system boundary.

Renewable Electricity

Energy Attribute Certificates (EACs) such as ✗ No
Renewable Energy Certificates (RECs) or Power
Purchase Agreements (PPAs) are included in the
baseline reported results:

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 1 metric ton of product of steel construction product.

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

Baie-d'Urfè

Impact Category	Unit	Method	A1	A2	A3	A1 - A3
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	1.53e+3	9.48e+1	4.06e+0	1.63e+3
ODP	kg CFC 11 eq	TRACI 2.1	2.48e-11	1.38e-6	5.62e-8	1.44e-6
AP	kg SO2 eq	TRACI 2.1	3.29e+0	4.61e-1	1.08e-2	3.76e+0
EP	kg N eq	TRACI 2.1	1.61e-1	1.27e-1	1.50e-2	3.03e-1
POCP	kg O3 eq	TRACI 2.1	5.55e+1	1.29e+1	1.89e-1	6.86e+1
ADP-fossil	MJ	TRACI 2.1	2.51e+4	1.28e+3	8.04e+1	2.65e+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:

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 = Particular 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.

A1 is the most contributory life cycle stage to all LCIA impact categories excluding ODP, representing 53% - 95% of the total cradle-to-gate result for the product produced in the Baie-d'Urfè site. A2 is the most contributory life cycle stage to ODP, representing 96% of the total cradle-to-gate result. A3 is an insignificant contributor to all LCIA impact categories excluding EP, representing <4% for GWP, ODP, AP, SFP, and ADP_{fossil}, and 5% of the total EP cradle-to-gate result.

St. Patrick

Impact Category	Unit	Method	A1	A2	A3	A1 - A3
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	1.53e+3	1.17e+2	3.07e+1	1.68e+3
ODP	kg CFC 11 eq	TRACI 2.1	2.48e-11	1.77e-6	4.35e-7	2.21e-6
AP	kg SO2 eq	TRACI 2.1	3.29e+0	4.80e-1	1.04e-1	3.87e+0
EP	kg N eq	TRACI 2.1	1.61e-1	1.33e-1	1.79e-1	4.73e-1
POCP	kg O3 eq	TRACI 2.1	5.55e+1	1.34e+1	1.73e+0	7.06e+1
ADP-fossil	MJ	TRACI 2.1	2.51e+4	1.62e+3	5.48e+2	2.73e+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:

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 = Particular 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.

A1 is the most contributory life cycle stage to GWP, AP, SFP, and ADP_{fossil} for the product produced at the St. Patrick site, representing 79% - 92% of the total cradle-to-gate result. A2 is the most contributory life cycle stage to ODP, representing 78% of the total cradle-to-gate result. A3 is the most contributory life cycle stage to EP, representing 38% of the total cradle-to-gate result.

Delta, Ohio

Impact Category	Unit	Method	A1	A2	A3	A1 - A3
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	1.76e+3	1.08e+1	3.40e+1	1.80e+3
ODP	kg CFC 11 eq	TRACI 2.1	2.72e-5	1.58e-7	3.74e-7	2.77e-5
AP	kg SO2 eq	TRACI 2.1	4.08e+0	5.00e-2	1.05e-1	4.24e+0
EP	kg N eq	TRACI 2.1	4.86e+0	1.38e-2	1.24e-1	5.00e+0
POCP	kg O3 eq	TRACI 2.1	6.94e+1	1.40e+0	1.59e+0	7.24e+1
ADP-fossil	MJ	TRACI 2.1	2.21e+4	1.46e+2	2.27e+4	4.49e+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:

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 = Particular 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.

A1 is the most contributory life cycle stage to all LCIA impact categories for the product produced in the Ohio site, representing 96% - 98% of the total cradle-to-gate result. A2 and A3 are both insignificant contributors to all LCIA impact categories, representing <1% and <4% of the total cradle-to-gate result respectively.

Production-Weighted Average

Impact Category	Unit	Method	A1	A2	A3	A1 - A3
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	1.59e+3	8.16e+1	2.44e+1	1.70e+3
ODP	kg CFC 11 eq	TRACI 2.1	7.47e-6	1.22e-6	3.15e-7	9.00e-6
AP	kg SO2 eq	TRACI 2.1	3.51e+0	3.57e-1	7.92e-2	3.95e+0
EP	kg N eq	TRACI 2.1	1.45e+0	9.87e-2	1.19e-1	1.67e+0
POCP	kg O3 eq	TRACI 2.1	5.93e+1	9.95e+0	1.27e+0	7.05e+1
ADP-fossil	MJ	TRACI 2.1	2.42e+4	1.12e+3	4.04e+2	2.57e+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:

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 = Particular 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.

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. 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 Indicator

per 1 metric ton of product of steel construction product.

Baie-d'Urfè

Indicator	Unit	A1	A2	A3	A1 - A3
RPRE	MJ	1.01e+3	2.60e+1	1.69e+2	1.21e+3
RPRM	MJ	0	0	0	0
NRPRE	MJ	2.54e+4	1.30e+3	8.59e+1	2.68e+4
NRPRM	MJ	0	0	0	0
SM	kg	4.68e+2	ND	ND	4.68e+2
RSF	MJ	0	0	0	0
NRSF	MJ	0	0	0	0
RE	MJ	0	0	0	0
FW	m3	4.65e+0	1.09e-1	4.71e-2	4.81e+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:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRM 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.

St. Patrick

Indicator	Unit	A1	A2	A3	A1 - A3
RPRE	MJ	1.01e+3	2.29e+1	4.70e+2	1.50e+3
RPRM	MJ	0	0	0	0
NRPRE	MJ	2.54e+4	1.63e+3	5.80e+2	2.76e+4
NRPRM	MJ	0	0	0	0
SM	kg	4.68e+2	ND	ND	4.68e+2
RSF	MJ	0	0	0	0
NRSF	MJ	0	0	0	0
RE	MJ	0	0	0	0
FW	m3	4.65e+0	1.13e-1	1.58e+0	6.34e+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:

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 PENRM = 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.

Delta, Ohio

Indicator	Unit	A1	A2	A3	A1 - A3
RPRE	MJ	6.33e+2	2.71e+0	2.17e+1	6.57e+2
RPRM	MJ	0	0	0	0
NRPRE	MJ	1.62e+4	1.48e+2	6.41e+2	1.70e+4
NRPRM	MJ	0	0	0	0
SM	kg	5.33e+2	ND	ND	5.33e+2
RSF	MJ	0	0	0	0
NRSF	MJ	0	0	0	0
RE	MJ	0	0	0	0
FW	m3	1.06e+1	1.18e-2	1.70e-1	1.08e+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:

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 PENRM = 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.

Product-Weighted Average

Indicator	Unit	A1	A2	A3	A1 - A3
RPRE	MJ	9.08e+2	1.82e+1	2.65e+2	1.19e+3
RPRM	MJ	0	0	0	0
NRPRE	MJ	2.29e+4	1.13e+3	4.62e+2	2.45e+4
NRPRM	MJ	0	0	0	0
SM	kg	4.86e+2	ND	ND	4.86e+2
RSF	MJ	0	0	0	0
NRSF	MJ	0	0	0	0
RE	MJ	0	0	0	0
FW	m3	6.28e+0	8.39e-2	7.76e-1	7.14e+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:

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 PENRM = 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 metric ton of product of steel construction product.

Baie-d'Urfè

Indicator	Unit	A1	A2	A3	A1 - A3
HWD	kg	5.51e+0	8.65e-3	5.60e-4	5.52e+0
NHWD	kg	9.99e+0	6.70e+1	5.96e-1	7.76e+1
HLRW	kg	0	0	0	0
ILLRW	kg	0	0	0	0
CRU	kg	0	0	0	0
MFR	kg	2.70e+1	ND	ND	2.70e+1
MER	kg	0	0	0	0
EE	MJ, LHV	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.

Data on radioactive waste disposal is not available in ecoinvent as an elementary flow. As such, impacts for HLRW and ILLRW are not reported by ACLCA guidance (ACLCA, 2018).

St. Patrick

Indicator	Unit	A1	A2	A3	A1 - A3
HWD	kg	5.51e+0	1.12e-2	3.03e-3	5.52e+0
NHWD	kg	9.99e+0	9.94e+1	2.85e+0	1.12e+2
HLRW	kg	0	0	0	0
ILLRW	kg	0	0	0	0
CRU	kg	0	0	0	0
MFR	kg	2.70e+1	ND	ND	2.70e+1
MER	kg	0	0	0	0
EE	MJ, LHV	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.

Data on radioactive waste disposal is not available in ecoinvent as an elementary flow. As such, impacts for HLRW and ILLRW are not reported by ACLCA guidance (ACLCA, 2018).

Delta, Ohio

Indicator	Unit	A1	A2	A3	A1 - A3
HWD	kg	7.05e+0	1.00e-3	3.16e-3	7.05e+0
NHWD	kg	1.53e+1	8.06e+0	2.18e+0	2.55e+1
HLRW	kg	0	0	0	0
ILLRW	kg	0	0	0	0
CRU	kg	0	0	0	0
MFR	kg	5.83e+1	ND	1.40e+2	1.98e+2
MER	kg	0	0	0	0
EE	MJ, LHV	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.

Data on radioactive waste disposal is not available in ecoinvent as an elementary flow. As such, impacts for HLRW and ILLRW are not reported by ACLCA guidance (ACLCA, 2018).

Production-Weighted Average

Indicator	Unit	A1	A2	A3	A1 - A3
HWD	kg	5.94e+0	7.70e-3	2.39e-3	5.95e+0
NHWD	kg	1.14e+1	6.55e+1	2.05e+0	7.90e+1
HLRW	kg	0	0	0	0
ILLRW	kg	0	0	0	0
CRU	kg	0	0	0	0
MFR	kg	3.56e+1	ND	3.83e+1	7.39e+1
MER	kg	0	0	0	0
EE	MJ, LHV	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.

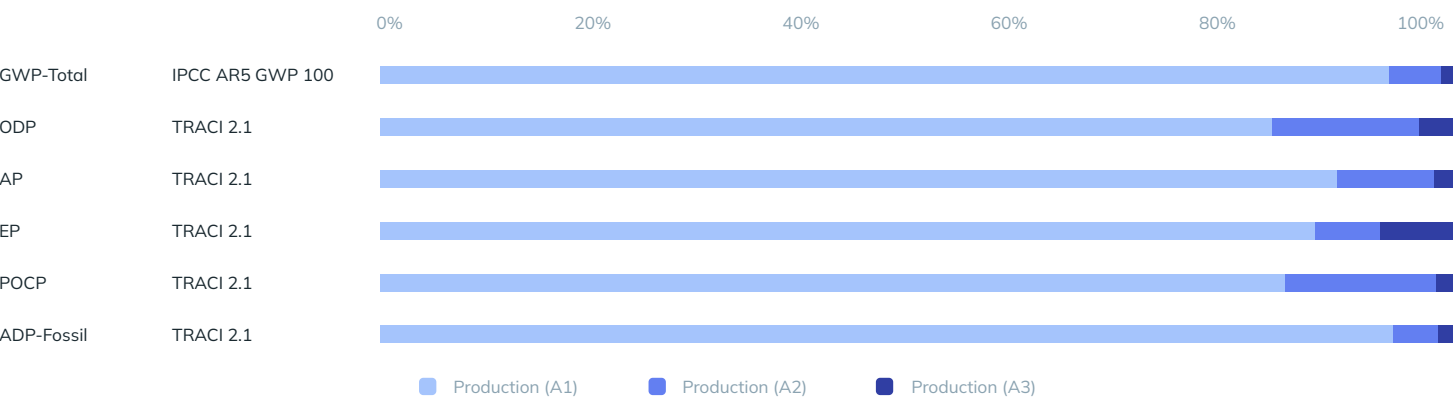
Data on radioactive waste disposal is not available in ecoinvent as an elementary flow. As such, impacts for HLRW and ILLRW are not reported by ACLCA guidance (ACLCA, 2018).

Interpretation

The LCA results indicate that the steel coil input is the largest contributor to the individual site results and the production-weighted average HSS and pipe products across all impact categories for Ohio facility. For the Canadian facilities, St. Patrick and Baie-d'Urfè, steel coil is the dominant contributor in all

categories except for ODP. The HSS and pipe products produced at the Ohio site have a higher GWP footprint (1,802 kgCO₂e/MT) than those of Baie-d'Urfè (1,629 kgCO₂e/MT) and St. Patrick (1,677 kgCO₂e/MT), respectively. At the St. Patrick, Baie-d'Urfè, and Ohio sites, steel inputs represent 91%, 94%, and 98%, respectively, of the total cradle-to-gate GWP footprint. The A1 stage is the highest contributing life cycle stage to GWP, AP, SFP, and ADP_{fossil} for the products produced at St. Patrick. The A1 stage is the highest contributing stage to GWP, AP, EP, SFP, and ADP_{fossil} for the products produced at the Baie-d'Urfè site. The A1 stage is the highest contributing life cycle stage to all LCIA impact categories for the products produced at the Ohio site. The production weighted average HSS and pipe product has a GWP of 1,698 kgCO₂e/MT, and is contributed most significantly by the A1 stage, representing 83% - 94% of each LCIA impact category.

The results of the LCIA indicate that the potential environmental impacts for the HSS products are driven by steel coil raw material input. Inbound transport of raw materials (A2) also have a modest contribution at St. Patrick and Baie-d'Urfè sites. Manufacturing stage (A3) was the second major contributor to all impact categories at the Delta, Ohio site.



Environmental Activities and Certifications

Certification
ISO 9001
NSF 61

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