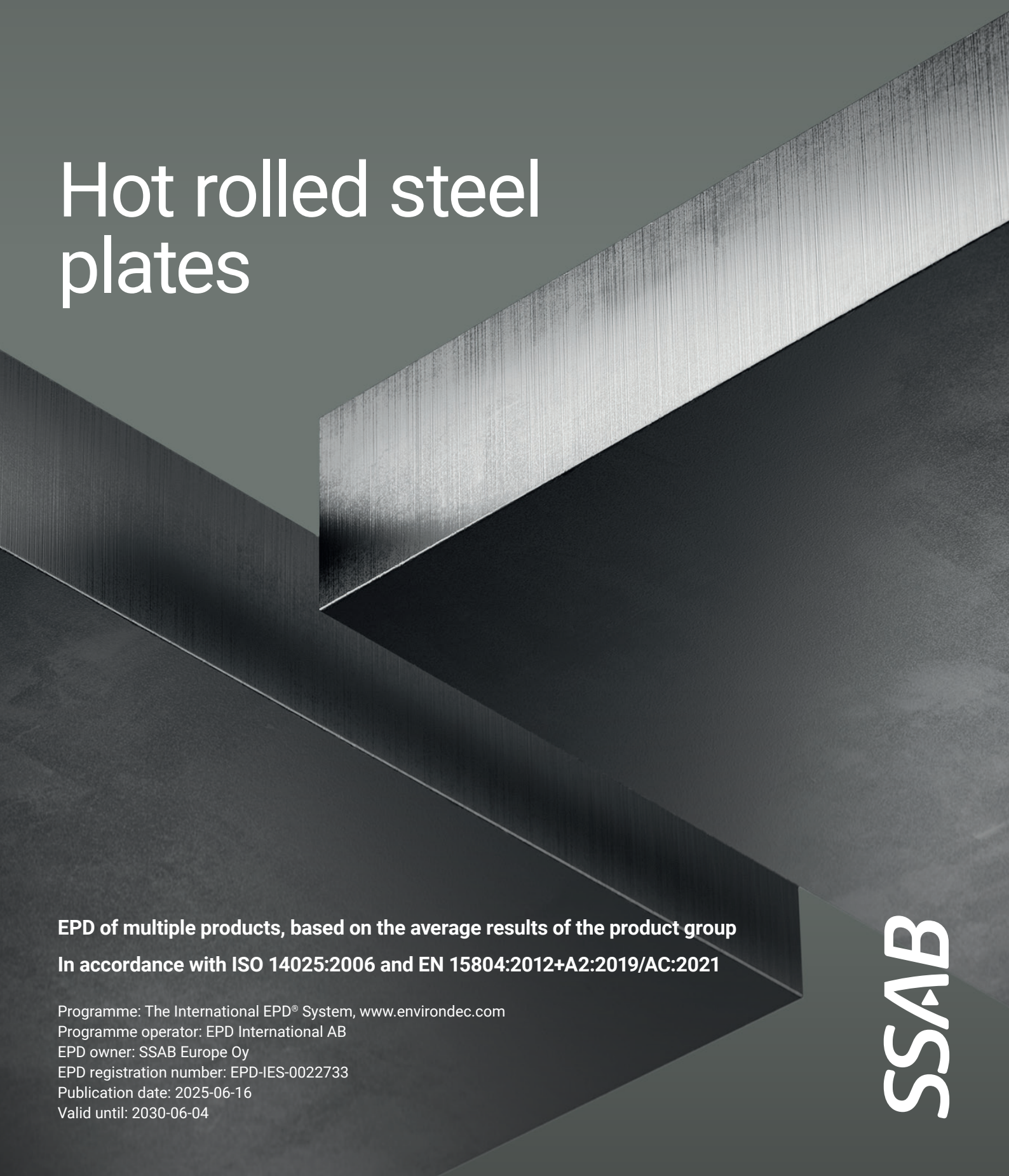
Environmental Product Declaration

Hot rolled steel plates



EPD of multiple products, based on the average results of the product group

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

Programme: The International EPD® System, www.environdec.com
Programme operator: EPD International AB
EPD owner: SSAB Europe Oy
EPD registration number: EPD-IES-0022733
Publication date: 2025-06-16
Valid until: 2030-06-04

SSAB

Contents

1. General information

PROGRAM INFORMATION

Program:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
Email:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
Core product category rules: CEN standard EN 15804 serves as the core PCR.
Product category rules: PCR 2019:14 Construction products. Version 1.3.4. Date 2024-04-30.
Product group classification: UN CPC 412.
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: Lisa Hallberg, IVL Swedish Environmental Research Institute.
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: David Althoff Palm, Dalemarken AB. Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No [Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programs, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

1.1 SSAB'S VISION – A STRONGER, LIGHTER AND MORE SUSTAINABLE WORLD

SSAB is a global steel company with a leading position in high-strength steels and related services. The company is a frontrunner in the green transformation of the steel industry and aims to largely eliminate carbon dioxide emissions from its operations and together with suppliers and customers create a fossil-free value chain.

SSAB's production sites are in Sweden, Finland and the USA and have an annual crude steel production capacity of 8.8 million tonnes. SSAB Europe is responsible for sales of strip, heavy plate, and tubular products in Europe as well as for the global business in the Automotive customer segment. SSAB Special Steels has global responsibility for sales of SSAB's quenched and tempered (Q&T) steels and advanced high-strength steels (AHSS). SSAB Americas is the largest heavy plate producer in North America and has a strong position based on cost efficiency and quality.

1.2 COMPANY INFORMATION

EPD owner:
SSAB Europe Oy, Kaisa Ahvonen, Harvialantie 420, 13300 Hämeenlinna, Finland.

Description of the organizations:
- SSAB Europe is responsible for strip, heavy plate, and tubular products in Europe as well as for the global business in the Automotive customer segment. SSAB Europe is also responsible for color coated products.
- SSAB Special steels is responsible for SSAB's quenched and tempered steels and advanced high-strength steels.

Name and location of production sites:
- SSAB Europe Oy (Raahe, Finland): Rautaruukintie 155, 92100 Raahe (Finland).
- SSAB EMEA AB (Oxelösund, Sweden): Aspleden 1, 613 80 Oxelösund (Sweden).

Certifications:
Certificates applicable to SSAB sites are ISO 14001 and ISO 9001.

Contact:
EPDssab@ssab.com.

2. Product information

2.1 PRODUCT TECHNICAL INFORMATION AND APPLICATIONS

SSAB specializes in materials for demanding applications where high strength and formability are needed for weight savings and increased durability. Hot rolled steel plates are used in many industries and applications such as construction, mining, lifting, shipbuilding, defence, heavy machinery, pressure equipment, and other different metal structures.

SSAB offers a comprehensive selection of hot rolled steel plates that includes structural steels, wear-resistant, protection, engineering and tool steels as well as surface pressure-resistant steels.

Hot rolled plates can be produced in a thickness range from 3.2 up to 160 mm, a width range from 1 000 up to 3 350 mm, and a maximum length up to 22 200 mm.

The products are often customized to meet national and/or international standards as well as customer-specific or other Original Equipment Manufacturer (OEM) standards. Besides standardized steel grades, SSAB's hot rolled plate product portfolio also includes products unique to SSAB and which in some cases may be patented.

For more detailed information about technical product properties and the product portfolio, please visit www.ssab.com.

2.2 PRODUCT DESCRIPTION

The scope of this EPD is SSAB hot rolled blast furnace-based steel plates, excluding prefabricated plates which are hot rolled steel plates that have undergone additional processing, such as painting, bending and/or bevelling.

The steel is an alloy of mainly iron and carbon, with small amounts of alloying and trace elements. Alloying elements improve the chemical and physical properties of steel, such as strength, ductility, durability, and corrosion resistance.

The exact composition of the steel manufactured by SSAB depends on product requirements, either based on national and/or international standards, such as EN 10025 or EN 10225, or on customer-specific and/or other OEM standards. SSAB's unique products also have their own specific requirements.

Content declaration and average chemical composition is presented in section 4.2. More detailed information on the different steel compositions is available from national and international standards, and on www.ssab.com.

2.3 LABELING AND PACKAGING

SSAB products are labeled to be easily identifiable and traceable. The packaging and protection are determined when ordering.

Steel bands or strappings, wood props, paper or plastic film, corner protection and other accessories supporting packaging are used as appropriate, depending on the protection needed.

Hot rolled steel plates are packed and, depending on product size, strapped to an appropriate pallet or packed in crates suitable for that purpose.

3. Production and transportation

3.1 PRODUCTION SITES

Blast furnace-based steel slabs used for hot rolled steel plates are manufactured at SSAB Raahe in Finland and at SSAB Oxelösund in Sweden. Slabs are produced using iron ore pellets and, as an energy source and reducing agent, coke from coal, and injection carbon. These raw materials are charged into a blast furnace to produce molten hot metal, pig iron.

Steel scrap and alloying elements are then added to the hot metal along with slag forming burnt lime, and oxygen is blown through the mixture to convert it into liquid steel in the basic oxygen furnace (BOF). The liquid crude steel is then cast into slabs on a continuous casting line.

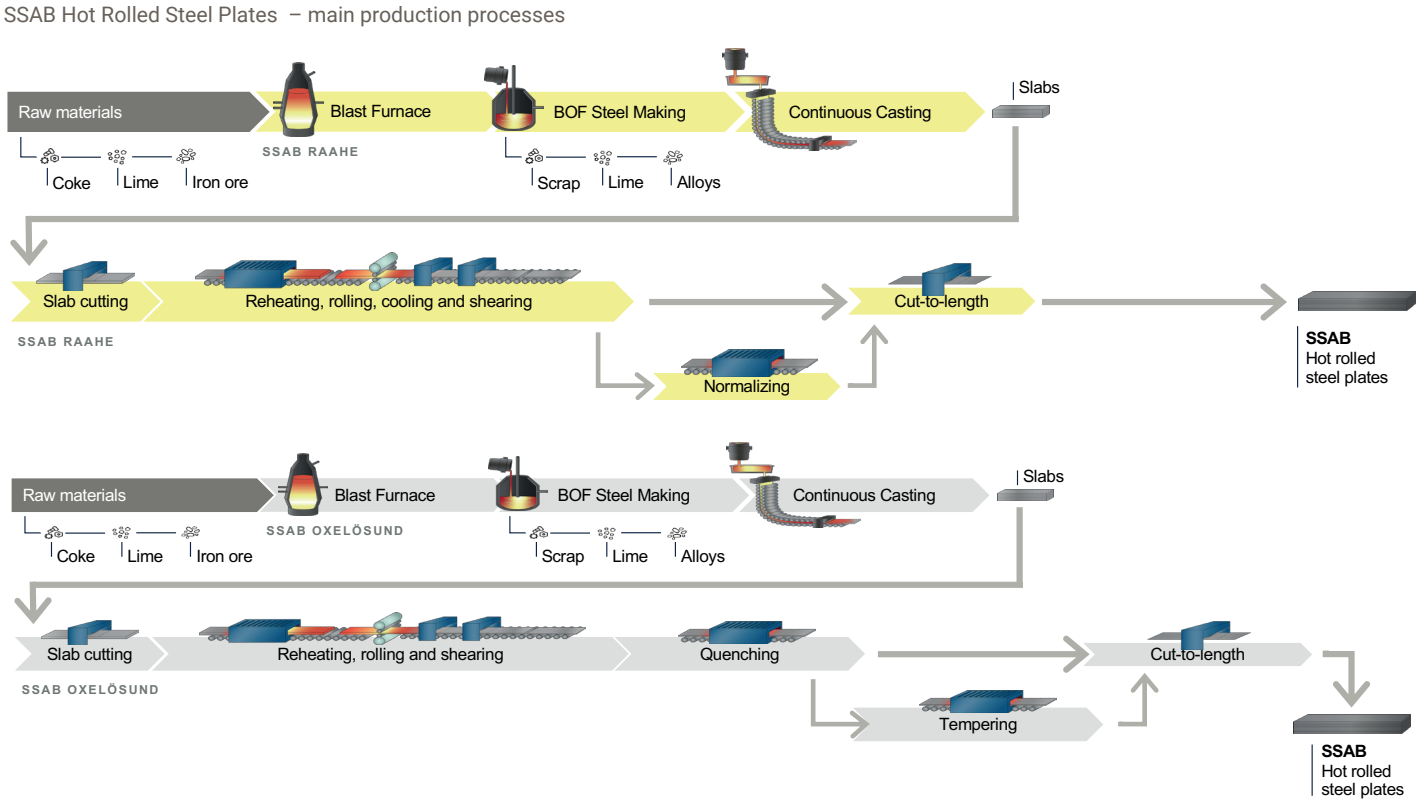
Blast furnace-based steel slabs are cut, reheated, rolled, cooled, sheared, normalized, and cut to length at SSAB Raahe, or cut, reheated, rolled, cooled, sheared, quenched, tempered, and cut to length at SSAB Oxelösund.

Co-products, such as slag, mill scale and iron oxide, generated in SSAB's steel production processes are recycled as industrial raw materials or materials to replace virgin resources. A high percentage of the baghouse dust originating in various processes is recycled to reduce waste and improve efficiency.

3.2 TRANSPORTATION

Each production facility carries out both steel slab manufacturing and processing to produce SSAB hot rolled steel plates. There is no internal transportation between sites.

FIGURE 1. SSAB production sites and main process steps for blast furnace-based hot rolled plates.



4. LCA

4.1 LCA INFORMATION

Declared unit:
1 kg of product

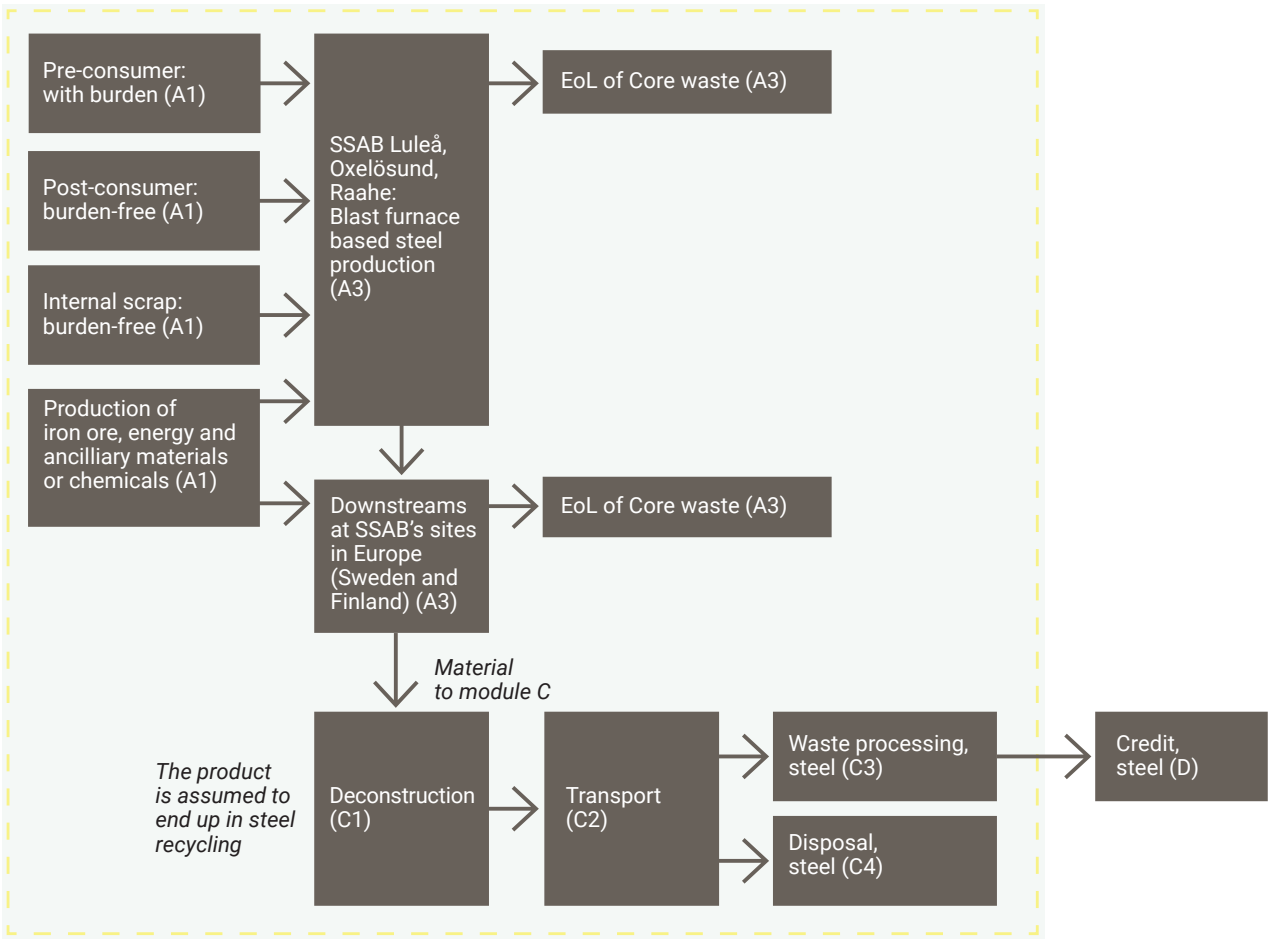
Reference service life:
Not applicable.

Description of system boundaries:
The system boundaries are cradle-to-gate with modules C1– C4 and module D.

Time representativeness:
2021 for the steel slab and plate production at SSAB Raahe,
2023 for the steel slab production at SSAB Oxelösund,
2022 for the plate production at SSAB Oxelösund.

Database(s) and LCA software used:
The LCA was modelled using the LCA software LCA for Experts and corresponding database (version 2024.1) provided by Sphera.

System diagram:



- Module A1: Production of raw materials and production of fuels
- Module A2: Transportation of raw materials to SSAB's manufacturing site
- Module A3: Manufacturing of steel products and management of production waste
- Module C1: Deconstruction of the product
- Module C2: Transport to waste processing and disposal
- Module C3: Waste processing of the product, to be sent to steel recycling
- Module C4: Disposal of the remaining part of the product in a landfill
- Module D: Benefits from recycling the steel.

Allocation:
Pre-consumer scrap is used in the production of steel. The environmental burden from the use of this scrap is allocated based on economic value by making a conservative assumption equal to 5% of virgin (blast furnace-based) steel. This corresponds to a value of 0.1 kg CO_2eq per kg of pre-consumer scrap.

Co-products from blast furnace and coke making operations have been allocated based on economic value as per PCR 2019:14. Similarly, impact associated with internal energy generation have been allocated based on economic value.

Cut-off criteria:
The maximum cut-off criteria established by the PCR and EN 15804:2012+A2:2019 standard is 1% of all material and energy flows to a single unit process and 5% of total inflows (mass and energy) to the upstream and core module. No cut-offs exceeding this limit have been made.

Inclusion of infrastructure and capital goods:
Infrastructure and capital goods are not included in any of the modules covered in this EPD. For the electricity sources of renewable origin (within the residual mix), the infrastructure of the power plant is included.

Electricity information:
At SSAB Oxelösund and SSAB Raahe, some of the electricity used is produced internally (corresponding to a GWP-GHG impact of 0.62 and 2.03 kg CO_2eq per kWh, respectively). For external electricity, the residual electricity mix for Sweden and for Finland has been applied (corresponding to a GWP-GHG impact of 0.07 kg CO_2eq per kWh, and 0.5 kg CO_2eq per kWh, respectively).

Scenario for module C1:
The product is being deconstructed by a machine powered by diesel.

Scenario for module C2:
The waste is transported 150 km by truck to waste processing (C3) and disposal (C4).

Scenario for module C3:
98% of the product is assumed to be processed in order to be sent for recycling.

Scenario for module C4:
2% of the product is assumed to be disposed of as waste at a landfill.

Scenario for module D:
The environmental benefit of the recycled steel is gained through the avoided production of primary steel. This benefit corresponds to -1.7 kg CO_2eq per kg of scrap in module D. The net flow of the recycled steel being credited in module D corresponds to 0.86 kg and is based on an assumed recycling rate of 98% and as well as on an assumption of yield losses in the steel recycling process.

Weighted average for the EPD:
The results represent a weighted average based on the production volumes for the product group.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation

Life cycle stage	Module		Modules declared	Geography	Specific data used	Variation - products	Variation - sites
Product stage	Raw material supply	A1	X	EU, SE & FI	79%	+5% -2%	<10%
	Transport	A2	X	EU, SE & FI			
	Manufacturing	A3	X	SE & FI			
Construction process stage	Transport	A4	ND	-	-	-	-
	Construction installation	A5	ND	-	-	-	-
Use stage	Use	B1	ND	-	-	-	-
	Maintenance	B2	ND	-	-	-	-
	Repair	B3	ND	-	-	-	-
	Replacement	B4	ND	-	-	-	-
	Refurbishment	B5	ND	-	-	-	-
	Operational energy use	B6	ND	-	-	-	-
	Operational water use	B7	ND	-	-	-	-
End of life stage	De-construction demolition	C1	X	EU	-	-	-
	Transport	C2	X	EU	-	-	-
	Waste processing	C3	X	EU	-	-	-
	Disposal	C4	X	EU	-	-	-
Resource recovery stage	Reuse-Recovery-Recycling-potential	D	X	EU	-	-	-

X: Module Declared
ND: Module not declared

4.2 PRODUCT CONTENT DECLARATION

Pre- and post-consumer scrap content is 3.2%. Recycled material content with internal scrap is 20.9%.

Content declaration and average chemical composition of hot rolled steel plates per kg produced is:

Product Composition	Weight (%)	Weight (kg)	Biogenic carbon, weight (%)	Biogenic carbon, weight (kg)
Pre-consumer scrap	1.3%	0.013	0%	0
Post-consumer scrap	1.9%	0.019	0%	0
Internal scrap	17.7%	0.177	0%	0
Primary steel	79.1%	0.791	0%	0
Average chemical composition*				
Iron (Fe)	> 97%			
Manganese (Mn)	1.3%			
Silicon (Si)	0.3%			
Carbon (C)	0.2%			
Other	< 1.5%			

** The figures provided represent the best estimate at the time of publication.*

Content Declaration of renewable packaging material	Weight (kg)	Weight % (of product)	Biogenic carbon, weight (kg/declared unit)
Wood	0.0042	0.42%	0.0018

The production of the packaging materials has been omitted since it falls under the cut-off limit. The content of biogenic material in the packaging is 0.0018 kg per kg of steel.

Hot rolled steel plates do not contain any of the substances of very high concern (SVHC) regulated by Regulation (EC) No 1907/2006 (REACH) or Regulation (EC) No 1272/2008 of the European Parliament and of the Council.

4.3 ENVIRONMENTAL PERFORMANCE INDICATORS RESULTS

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Usage of results from A1–A3 without considering the results of module C is not encouraged.

Potential environmental impact – mandatory indicators according to EN 15804+A2 (version EF 3.1)

Results per declared unit: 1 kg of product								
Indicator		**Unit**	**A1 – A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential (GWP)	Climate Change - fossil	kg CO_2 eq	2.22	4.39E-04	1.01E-02	2.71E-03	2.99E-04	-1.49
	Climate Change - biogenic	kg CO_2 eq	1.07E-03	1.34E-06	2.68E-05	1.01E-05	9.52E-07	3.16E-04
	Climate Change - land use and land use change (LULUC)	kg CO_2 eq	4.91E-04	7.31E-06	8.61E-05	3.66E-05	1.80E-06	-1.98E-04
	Climate Change - total	kg CO_2 eq	**2.22**	4.47E-04	1.03E-02	2.76E-03	3.02E-04	-1.49
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC-11 eq	1.50E-11	4.39E-17	1.34E-18	4.89E-15	8.08E-16	2.00E-12
Acidification potential (AP)		mole H+ eq	7.12E-03	3.01E-06	1.18E-05	1.36E-05	2.13E-06	-3.64E-03
Eutrophication potential (EP)	Freshwater	kg P eq	8.78E-07	1.86E-09	3.12E-08	1.05E-08	6.80E-10	-3.47E-07
	Marine	kg N eq	1.53E-03	1.49E-06	3.93E-06	6.24E-06	5.47E-07	-5.85E-04
	Terestrial	mole N eq	1.66E-02	1.65E-05	4.74E-05	6.90E-05	6.03E-06	-5.24E-03
Formation potential of tropospheric ozone (POCP)		kg NMVOC eq	1.05E-02	2.89E-06	1.01E-05	1.73E-05	1.67E-06	-2.38E-03
Abiotic depletion potential (ADP)	Minerals and metals*	kg Sb eq	2.85E-05	3.71E-11	8.05E-10	2.84E-09	1.94E-11	-8.43E-06
	Fossil resources*	MJ	28.1	5.68E-03	0.140	5.07E-02	3.95E-03	-14.8
Water scarcity potential (WDP)*		m^3	0.602	6.48E-06	9.13E-05	5.18E-04	3.43E-05	-0.100

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*
Note: Biogenic carbon in packaging is balanced in A1–A3.

Additional mandatory and voluntary impact category indicators

Results per declared unit: 1 kg of product								
Indicator		**Unit**	**A1 – A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential (GWP)	GWP-GHG (1)	kg CO_2 eq	2.22	4.47E-04	1.03E-02	2.76E-03	3.02E-04	-1.49

(1) This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the characterization factor for biogenic CO_2 is set to zero.

Resource use indicators

Results per declared unit: 1 kg of product								
Indicator		**Unit**	**A1 – A3**	**C1**	**C2**	**C3**	**C4**	**D**
Primary energy resources – Renewable	Used as energy carrier (PERE)	MJ	1.55	4.80E-04	7.81E-03	5.41E-03	6.89E-04	0.584
	Used as raw materials (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Total (PERT)	MJ	1.55	4.80E-04	7.81E-03	5.41E-03	6.89E-04	0.584
Primary energy resources – Non-renewable	Used as energy carrier (PENRE)	MJ	28.1	5.68E-03	0.140	5.07E-02	3.95E-03	-14.8
	Used as raw materials (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Total (PENRT)	MJ	28.1	5.68E-03	0.140	5.07E-02	3.95E-03	-14.8
Use of secondary material (SM)		kg	3.66E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)		MJ	4.16E-26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non renewable secondary fuels (NRSF)		MJ	4.89E-25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)		m^3	1.78E-02	5.39E-07	8.94E-06	1.51E-05	1.05E-06	-0.151

Note: Primary energy calculated using PCR option B.

Waste indicators

Results per declared unit: 1 kg of product							
Indicator	**Unit**	**A1 – A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	kg	1.06E-06	1.84E-13	7.06E-12	7.33E-12	9.84E-13	-1.11E-07
Non-hazardous waste disposed (NHWD)	kg	7.23E-02	8.84E-07	2.08E-05	1.39E-05	2.00E-02	0.179
Radioactive waste disposed (RWD)	kg	1.15E-03	7.34E-09	1.70E-07	6.38E-07	4.15E-08	1.62E-06

Output indicators

Results per declared unit: 1 kg of product							
Indicator	**Unit**	**A1 – A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	0.00E+00	0.00E+00	0.00E+00	0.980	0.00E+00	0.00E+00
Material for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Disclaimer

ILCD classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Variation in environmental indicators

The table below shows the variation for modules A–C where the difference between products is greater than 10%.

Hot rolled steel plates	
Environmental impact indicator	**Difference (%)**
GWP-biogenic	58%
GWP-LUC	14%
ODP	86%
AP	42%
EP-fresh	56%
EP-marine	22%
EP-terrest	24%
POCP	78%
ADP-elements	91%
ADP-fossil	18%
Water scarcity	39%

5. References

- General Programme Instructions of the International EPD® System. Version 4.0
- PCR 2019:14 Construction products. Version 1.3.4 (2024-04-30)
- CEN European Committee for Standardisation (2021). EN15804:2012+A2:2019/ AC:2021 (CEN 2021), Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- LCA for experts Software System and database for Life Cycle Engineering, sphera, Leinfelden-Echterdingen, Germany
- Hallberg, L., LCA methodology report – SSAB Blast Furnace steel, as basis for the publication of EPDs within the International EPD® System, June 2025.

SSAB

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