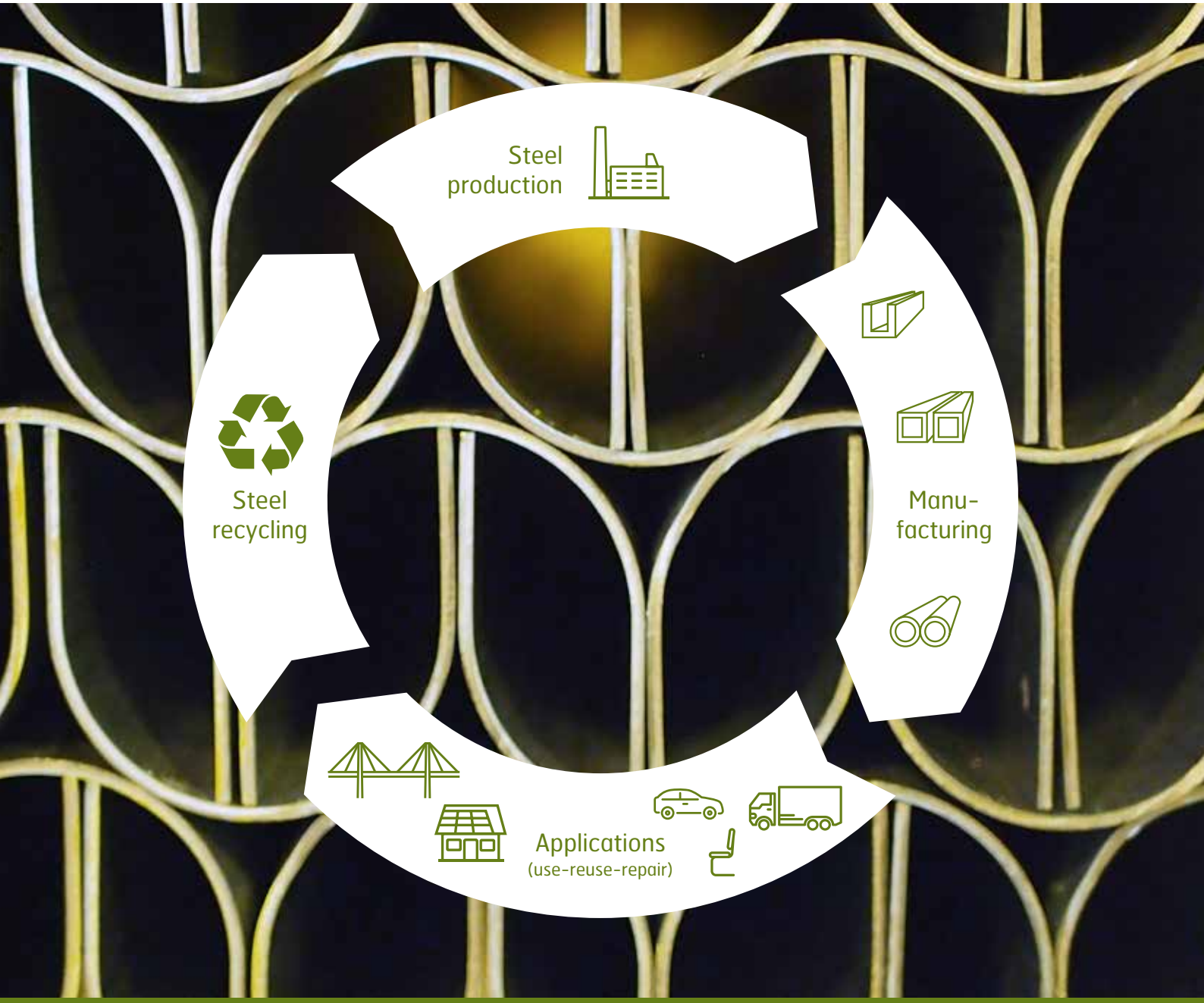


Open sections

Environmental Product Declaration (EPD)
In accordance with ISO 14025 and EN 15804:2012+A2:2019

S-P-04779, version 1.0
UN CPC 412
Programme: The International EPD® System, www.environdec.com
Programme operator: EPD International AB
Publication date: 2021-12-13
Validity date: 2026-10-11

CONTENT

1. SSAB

1.1 DESCRIPTION OF THE ORGANISATION

SSAB is the leading steel tube manufacturer in the Nordic countries with a broad selection of products to meet the needs of the construction, automotive and manufacturing industries. SSAB is also one of the leading suppliers of steel infrastructure products in Europe especially for foundation construction. Extensive range of products include structural hollow sections, precision tubes, open sections, steel piles, retaining walls, safety barriers, trapezoidal sections and water mains. We expertise in high-strength steels and aim at exceeding expectations by continuously developing our operations and products keeping customer's business on focus.

1.2 PRODUCT-RELATED OR MANAGEMENT SYSTEM-RELATED CERTIFICATIONS

Quality management system certification (ISO 9001:2015 9 1 6 59-2011-AQ-FIN-FINAS) and Environmental management system certifications ISO 14001:2015 (9 1 6 60-2011-AE-FIN-FINAS).

1.3 NAME AND LOCATION OF PRODUCTION SITE(S)

Open sections are manufactured at SSAB's production site in Toijala, Finland. Hot rolled steel for the production of open sections is manufactured at SSAB's mill in Raahe.

SSAB Europe Oy, Toijala Works, Hämeentie 100, FI-37800 Toijala, Finland.

2. Product information

2.1 PRODUCT NAME

Open section

2.2 PRODUCT IDENTIFICATION

Cold rolled steel sections according to standard EN 10162. SSAB Domex Sections meet standards EN 10149-2, EN 10025-2 or EN 10346 depending on selected product. SSAB Domex Sections tolerances meet or exceed, when applicable, the requirements of EN 10162.

SSAB Weathering Sections tolerances of the SSAB Weathering Sections meet or exceed, when applicable, the requirements of EN 10162.

Strenx® Sections meet or exceed the requirements of EN 10149-2. Tolerances of the Strenx® Sections meet or exceed, when applicable, the requirements of EN 10162.

2.3 PRODUCT DESCRIPTION

SSAB Domex Sections are suitable for practically any kind of steel structure for buildings, machines and appliances. SSAB Weathering Section is an open section with anti-corrosive properties, which minimize the need for maintenance and corrosion-prevention treatment. For Strenx® Sections typical applications include demanding load-bearing structures in the lifting, handling and transportation segments.

2.4 UN CPC CODE

4128

3. LCA information

- **Functional unit / declared unit:** 1 ton open section
- **Reference service life:** If properly installed and maintained, the service lifetime of the open sections is equal to the lifetime of the building, and 50 years as a default.
- **Time representativeness:** The data is collected from year 2019. The database data is from 2019.
- **Database(s) and LCA software used:** SimaPro (release 9.1.0.11). Databases ecoinvent 3.6 and Industry data 2.0.
- **Description of system boundaries:** Cradle to gate with options, modules C1 – C4, and module D (A1 – A3, C, D and additional modules). The additional module is A4.

  Modules A5 and B1 – B5 are not assessed. B6 and B7 are not relevant. In B1 – B5, only minimal maintenance is required. The excluded modules are very dependent on particular scenarios for a specific building or construction work.

MORE INFORMATION

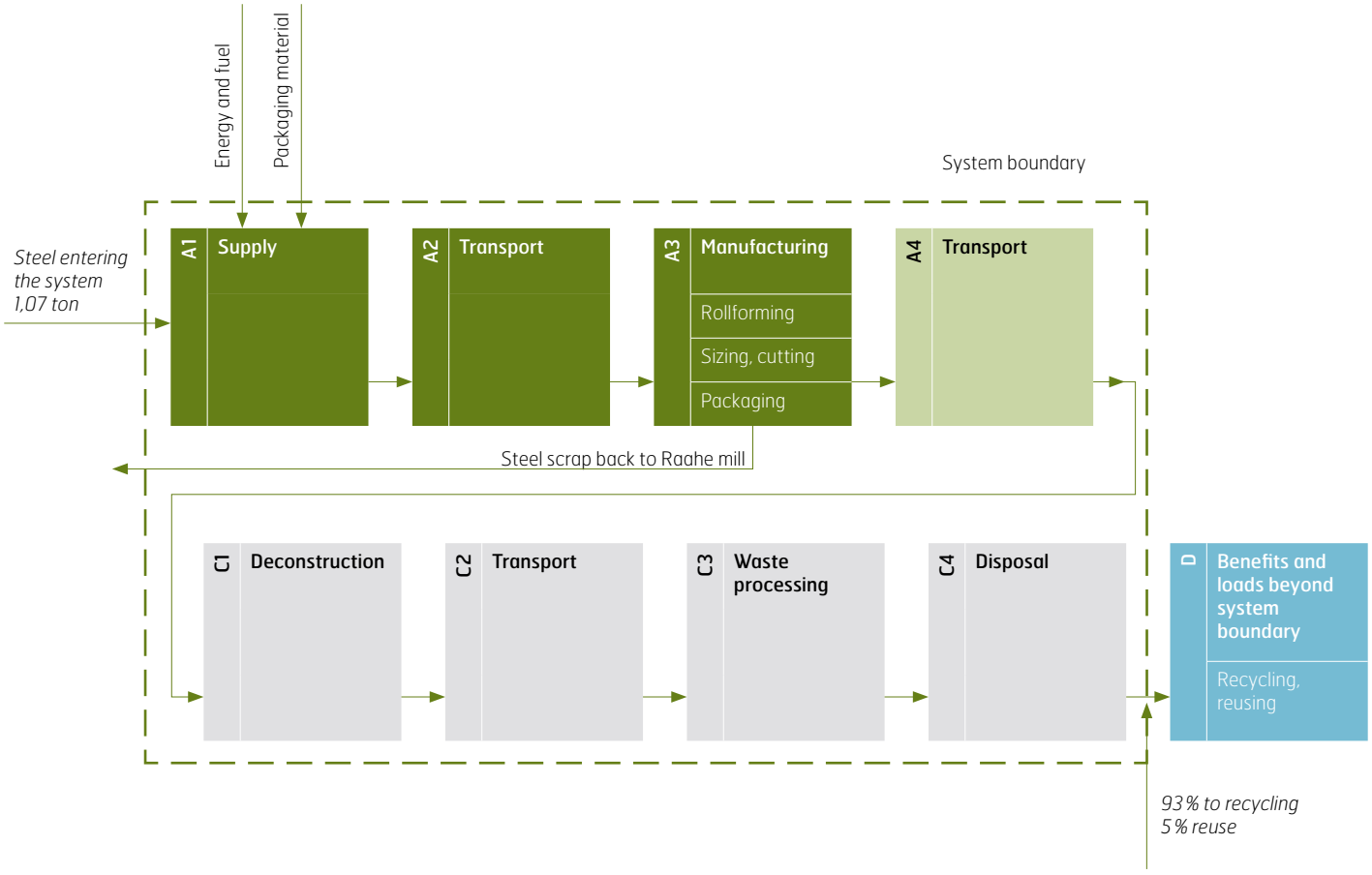
- **LCA practitioner:** Ecobio Oy, info@ecobio.fi
  Electricity in module A3 covers more than 30 % of the total energy in modules A1 – A3. Therefore, the energy sources and climate impacts as g CO_2 eq./kWh. must be informed.
- **Energy sources for electricity:** Market priced electricity with the following energy sources: 20 % renewable, 51 % nuclear and 29 % fossil fuels and peat.
- **Climate change impact of electricity:** 265 g CO_2 eq./kWh.
- **Cut-off rule:** 1 % cut-off rule was applied for input flows in the inventory. The material used is as up-to-date as possible and at most five years old for producer specific data and at most ten years old for generic data.
- **Allocation:** Steel scrap produced in module A3 is treated as co-product and environmental impacts are allocated for it based on economic values.
- **Use of secondary material:** Steel production is based on the use of iron ore as a raw material. However, SSAB uses approximately 20 % of scrap steel in conjunction with steel production in the Nordics. The use of raw materials and energy has been optimized in steel production.
- **Alternative raw materials:** Open sections can also be manufactured from stainless steel, galvanized steel or cold rolled steel. These are not included to the calculation of environmental impacts of the product as open sections manufactured from stainless steel and galvanized steel exceed the required 10 % difference in GWP-GHG impact category in modules A1-A3 for average product. Cold rolled steel is not included as its share from the total production volume of open sections is fairly small.

  The effect of alternative raw materials on GWP-GHG impacts of open sections for modules A1-A3 are presented below. This enables use of the results as part of carbon footprint calculations of buildings.

  If hot rolled coil is substituted by SSAB Europe Oy's metal coated cold rolled strip, GWP-GHG value for A1-A3 increases by 13,92 %.

  If stainless steel is used instead of hot rolled coil, GWP-GHG value for A1-A3 increases by 17,77 %.

  If SSAB Europe Oy's cold rolled annealed strip is used instead of hot rolled coil, GWP-GHG value for A1-A3 increases by 8,99 %.



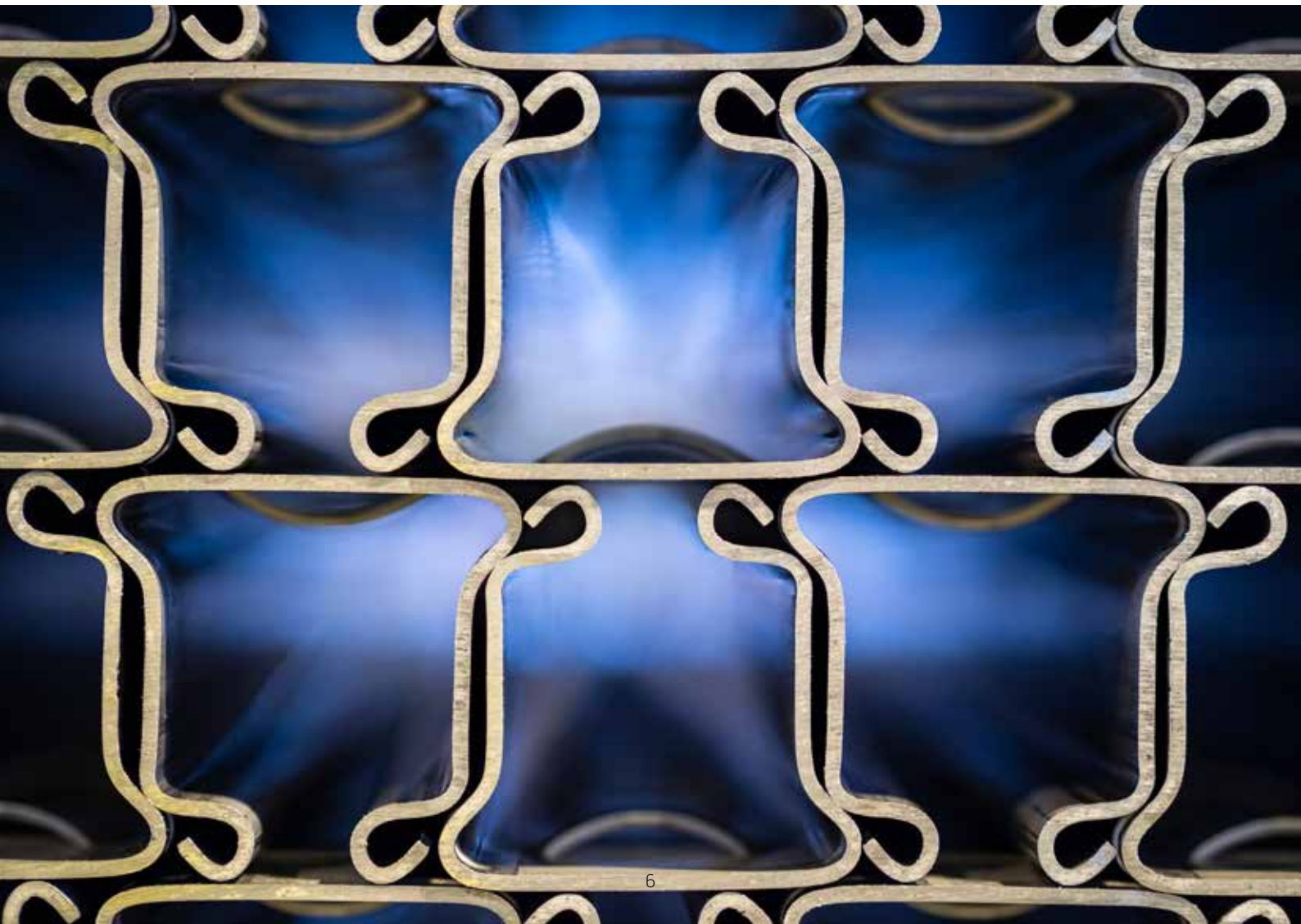
MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG INDICATOR) AND DATA VARIATION

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	EU27	EU27	EU27	EU27	-	-	-	-	-	-	-	-	EU27	EU27	EU27	EU27	EU27
Specific data	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	not relevant					-	-	-	-	-	-	-	-	-	-	-	-

4. Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Hot rolled steel	1000	2,6 %	0
TOTAL	**1000**	**2,6 %**	**0**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Wood	3,51	0,35	
Plastic film	0,03	0,0003	
Cardboard	0,03	0,0003	
Steel straps	0,63	0,06	
TOTAL	**4,2**	**0,42**	

The product does not contain substances which exceed the limits for registration with the European Chemicals Agency regarding the “Candidate List of Substances of Very High Concern for authorization”.



5. Environmental information

POTENTIAL ENVIRONMENTAL IMPACT – MANDATORY INDICATORS ACCORDING TO EN 15804

Indicator	Unit	Results per 1 ton of open sections									
		A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	2,29E+03	1,83E+01	4,62E+01	2,35E+03	1,13E+02	9,63E-02	8,30E+00	2,32E+01	1,05E-01	-1,64E+03
GWP-biogenic	kg CO_2 eq.	1,91E-01	5,31E-01	-8,40E+00	-7,68E+00	1,93E-01	2,90E-03	1,99E-02	-1,40E+00	3,25E-04	-1,11E+00
GWP-luluc	kg CO_2 eq.	5,66E-01	2,98E-02	2,47E-01	8,42E-01	4,91E-02	1,06E-04	2,79E-03	2,48E-02	2,85E-05	2,00E-01
GWP-total	kg CO_2 eq.	2,29E+03	1,88E+01	3,81E+01	2,34E+03	1,13E+02	9,93E-02	8,32E+00	2,19E+01	1,05E-01	-1,64E+03
ODP	kg CFC 11 eq.	1,20E-10	1,55E-06	6,03E-06	7,58E-06	2,48E-05	2,68E-09	1,88E-06	3,15E-06	4,33E-08	-8,58E-13
AP	mol H^+ eq.	6,30E+00	1,18E-01	1,98E-01	6,62E+00	1,41E+00	2,79E-04	3,32E-02	1,99E-01	9,91E-04	-3,04E+00
EP-freshwater	kg P eq.	1,64E-03	1,11E-02	8,33E-03	2,10E-02	6,32E-03	5,05E-05	5,57E-04	1,51E-02	9,80E-06	-3,51E-04
EP-freshwater	kg PO_4^{3-}	6,08E-04	4,09E-03	3,08E-03	7,78E-03	2,34E-03	1,87E-05	2,06E-04	5,60E-03	3,63E-06	-1,30E-04
EP-marine	kg N eq.	1,60E+00	3,29E-02	3,07E-02	1,67E+00	3,44E-01	5,01E-05	1,02E-02	6,33E-02	3,46E-04	-4,70E-01
EP-terrestrial	mol N eq.	1,73E+01	3,38E-01	3,25E-01	1,79E+01	3,81E+00	4,45E-04	1,11E-01	7,09E-01	3,79E-03	-4,63E+00
POCP	kg NMVOC eq.	4,74E+00	9,45E-02	9,92E-02	4,94E+00	1,04E+00	1,72E-04	3,39E-02	1,90E-01	1,10E-03	-2,31E+00
ADP-minerals &metals*	kg Sb eq.	3,71E-03	9,89E-05	1,10E-04	3,92E-03	3,25E-04	3,03E-07	2,99E-05	2,90E-03	2,35E-07	-3,28E-03
ADP-fossil*	MJ	2,52E+04	2,95E+02	1,00E+03	2,65E+04	1,63E+03	1,07E+00	1,26E+02	3,22E+02	2,94E+00	-1,44E+04
WDP	m^3	-1,42E+02	3,27E+00	8,88E+00	-1,30E+02	3,81E+00	8,88E-02	3,43E-01	4,07E+00	1,32E-01	-2,02E+02
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption										

* 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.

POTENTIAL ENVIRONMENTAL IMPACT – ADDITIONAL MANDATORY AND VOLUNTARY INDICATORS

Indicator	Unit	Results per 1 ton of open sections									
		A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	2,29E+03	1,81E+01	4,61E+01	2,35E+03	1,12E+02	9,56E-02	8,23E+00	2,30E+01	1,03E-01	-1,58E+03
Particulate matter emissions	Disease incidence	5,89E-05	9,13E-07	1,45E-06	6,13E-05	5,91E-06	4,68E-08	5,75E-07	3,46E-06	1,94E-08	-5,01E-05
Ionising radiation, human health	kBq U235 eq	1,83E+01	5,36E+00	3,59E+01	5,96E+01	8,20E+00	2,82E-02	6,55E-01	3,33E+00	1,31E-02	4,03E+01
Ecotoxicity (freshwater)	CTUe	4,14E+03	2,87E+02	5,82E+02	5,01E+03	1,17E+03	8,17E-01	9,59E+01	1,18E+03	1,85E+00	9,07E+00
Human toxicity, cancer effects	CTUh	1,95E-07	2,89E-08	1,91E-08	2,43E-07	5,41E-08	3,40E-09	3,42E-09	3,59E-08	5,50E-11	4,14E-07
Human toxicity, noncancer effects	CTUh	1,20E-05	2,29E-07	2,91E-07	1,25E-05	1,04E-06	1,20E-09	9,74E-08	9,14E-07	1,15E-09	-2,18E-05
Land use related impacts / soil quality	Pt	1,33E+03	2,06E+02	1,05E+03	2,59E+03	8,75E+02	1,65E-01	8,64E+01	6,15E+02	6,18E+00	3,11E+02

1. The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

USE OF RESOURCES

Results per 1 ton of open sections											
Indicator	Unit	A1	A2	A3	Tot. A1–A3	A4	C1	C2	C3	C4	D
PERE	MJ	7,39E+02	3,43E+01	3,31E+02	1,10E+03	1,86E+01	1,68E-01	1,69E+00	5,25E+01	2,37E-02	1,02E+02
PERM	MJ	0	0	5,46E-02	5,46E-02	0	0	0	0	0	0
PERT	MJ	7,39E+02	3,43E+01	3,31E+02	1,10E+03	1,86E+01	1,68E-01	1,69E+00	5,25E+01	2,37E-02	1,02E+02
PENRE	MJ	2,52E+04	3,50E+02	1,05E+03	2,66E+04	1,63E+03	1,28E+00	1,26E+02	3,60E+02	2,96E+00	-1,44E+04
PENRM	MJ.	0	0	6,12E-04	6,12E-04	0	0	0	0	0	0
PENRT	MJ	2,52E+04	3,50E+02	1,05E+03	2,66E+04	1,63E+03	1,28E+00	1,26E+02	3,60E+02	2,96E+00	-1,44E+04
SM	kg	2,60E+00	0	0	2,60E+00	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m^3	-1,75E+00	1,91E-01	6,86E-01	-8,72E-01	1,39E-01	2,68E-03	1,26E-02	1,62E-01	3,13E-03	-2,88E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water										

5.1 WASTE PRODUCTION AND OUTPUT FLOWS

WASTE PRODUCTION

Results per 1 ton of open sections											
Indicator	Unit	A1	A2	A3	Tot. A1–A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,98E-05	3,78E-04	1,13E+00	1,13E+00	3,42E-03	4,32E-07	3,27E-04	8,90E-04	4,34E-06	0,00E+00
Nonhazar-dous waste disposed	kg	6,42E+01	4,42E+00	7,39E+01	1,42E+02	5,75E+01	4,18E-03	6,01E+00	9,67E+00	2,00E+01	0,00E+00
Radioactive waste disposed	kg	1,72E-01	1,80E-03	9,60E-03	1,83E-01	1,12E-02	7,60E-06	8,59E-04	1,91E-03	1,93E-05	0,00E+00

OUTPUT FLOWS

Results per 1 ton of open sections											
Indicator	Unit	A1	A2	A3	Tot. A1–A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	50	0	0
Material for recycling	kg	0	0	72	72	0	0	0	930	0	0
Materials for energy recovery	kg	0	0	0,9	0,9	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0

INFORMATION ON BIOGENIC CARBON CONTENT

Results per 1 ton of open sections		
Biogenic carbon content	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0,002

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

6. Additional information – scenarios

Transport to construction site (A4)

Parameter	Unit
Vehicle type	Lorry, 16 – 32 metric ton
Load capacity	37 % (ecoinvent 3.6)
Distance	Varies for different transportation countries
Bulk density	1 922 kg/m^3

Parameter	Unit
Vehicle type	Ferry
Load capacity	65 % (LIPASTO)
Distance	Varies for different transportation countries
Bulk density	1 922 kg/m^3

End-of-life (C)

Parameter	Unit
Collection process	Collected separately
Transportation	50 km road
Recovery system	5 % reused, 93 % recycled
Disposal	2 % inert material landfill

Recycling and reuse (D)

Module D is based on Worldsteel Recycling methodology. The methodology is presented more precisely in Worldsteel Association's Life Cycle Inventory methodology report. This is listed in the references at the end of this report.

Reuse of the product is assumed to substitute primary hot rolled steel production.

7. Differences versus previous versions

There are no previous versions of the EPD.

8. Programme information

Program	The International EPD® System. EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. www.environdec.com
EPD registration number	S-P-04779
Published	2021-12-13
Revision date	
Valid until	2026-10-11
Product group classification	UN CPC 4128
Reference year for data	2019
Geographical scope	Europe

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Core product category rules (c-PCR)	CEN standard EN 15804 serves as the Core Product Category Rules (PCR).
Product category rules (PCR)	PCR 2019:14 Construction products. Version 1.11. UN CPC code: 4128
PCR review was conducted by	The Technical Committee of the International EPD® System. Chair: Claudia A. Peña. Contact via info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☐ EPD Process Certification (internal) ◉ EPD Verification (external)
Third party verifier	Hannu Karppi Ramboll Finland Oy
In case of recognised individual verifiers: **Approved by**	The International EPD® System.
Procedure for follow-up of data during EPD validity involves third party verifier	☐ Yes ◉ No

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

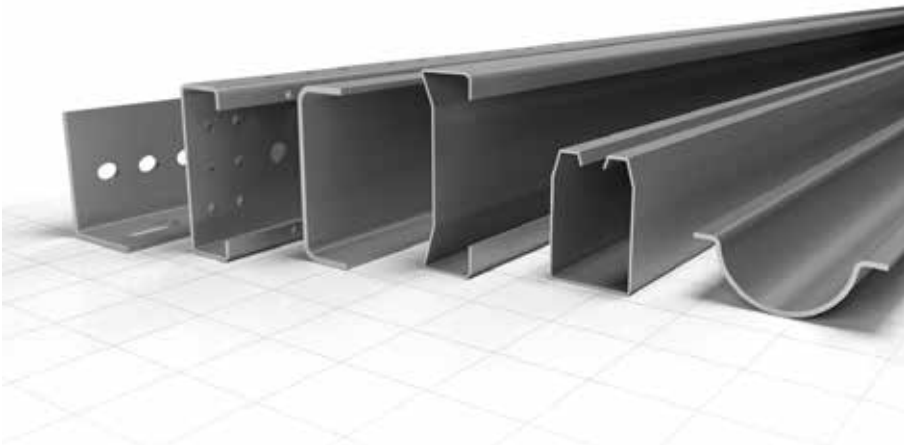
EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

9. References

- General Programme Instructions of the International EPD® System. Version 3.01.
- PCR 2019:14. Construction products. Version 1.11
- Ecobio Oy. 2021. LCA Report – SSAB Europe Oy's open sections and Safety barriers.
- Worldsteel Association. 2017. Life cycle inventory methodology report.

10. Contact information

EPD owner	SSAB Europe Oy Tubular Products FI – 13300 Hämeenlinna Finland www.ssab.com Petteri Steen
LCA author:	Ecobio Oy Malminkatu 16 00100 Helsinki Finland www.ecobio.fi info@ecobio.fi
Program operator	EPD International AB info@environdec.com



SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world. SSAB has employees in over 50 countries. SSAB has production facilities in Sweden, Finland and the US. SSAB is listed on the Nasdaq OMX Nordic Exchange in Stockholm and has a secondary listing on the Nasdaq OMX in Helsinki.

824-en-EPD – Open sections-v1-2022. Confetti.

www.ssab.com

SSAB