FERALPI SIDERURGICA

FERGreen.

Environmental Product Declaration

FERGreen.SPOOLER

REINFORCING STEEL IN COILS, HOT ROLLED AND DIRECTLY SPOOLED

EPD OF A PRODUCT RECENTLY ON THE MARKET WITH LIMITED DATA COLLECTION

Pogram Operator:
EPDItaly

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In accordance with ISO 14025 and EN 15804:2012+A2:2019

FERALPI SIDERURGICA SPA - FERALPI GROUP, VIA NICOLA PASINI 11, 25017 LONATO, BRESCIA - ITALY

EPD ITALY

ECO PLATFORM EPD VERIFIED

General information

EPD OWNER

NAME OF THE COMPANY: FERALPI SIDERURGICA SPA - FERALPI GROUP, Via Nicola Pasini 11, 25017 Lonato, Brescia - Italy

REGISTERED OFFICE: FERALPI SIDERURGICA SPA - FERALPI GROUP, Via Nicola Pasini 11, 25017 Lonato, Brescia - Italy. Manufacturing plant is located in the same site

PROGRAM OPERATOR: EPDITALY, Via Gaetano De Castillia 10, 20124 Milano - ITALIA

INFORMATION ON THE EPD

PRODUCT NAME: FERGreen Spooler - Reinforcing steel in coils, hot rolled and directly spooled

SITE(S): Via Nicola Pasini 11, 25017 Lonato, Brescia

SHORT DESCRIPTION AND TECHNICAL INFORMATION OF THE PRODUCT: FERGreen.SPOOLER is a reinforcing steel in coils, hot-rolled and directly spooled. The product is produced at Feralpi plant in Lonato del Garda (BS).

FIELD OF APPLICATION OF THE PRODUCT: Reinforcing steel for the reinforcement of concrete in the construction sector.

CPC CODE: 412

INFORMATION VERIFICATION

PCR: PCR ICMQ001/15 for construction products (Rev. 3.1, 12/11/2024)

EPDItaly Regulation: Rev. 6.0, 30/10/2023 - Annex 5 EPD of a product recently on the market with limited data collection

PROJECT REPORT LCA: Life Cycle Assesment (LCA) applied to steel products for EPD purposes of a new product on the market with limited data collection Rev. 03 29/04/2025

INDIPENDENT VERIFICATION:

CEN standard EN 15804 served as the core PCR.
Independent verification of the declaration and data, carried out according to ISO 14025: 2010.

☐ EPD process certification (Internal)

☑ EPD verification (External)

Third party verification carried out by: ICMQ S.p.A., via Gaetano De Castillia n° 10 - 20124 Milano, Italia.
Accredited by Accredia

COMPARABILITY: Environmental statements published within the same product category, but from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN15804:2012+A2:2019.

LIABILITY: The EPD Owner releases EPDItaly from any noncompliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence. EPDItaly disclaims any responsibility for the information, data and results provided by the EPD Owner for life cycle assessment.

OTHER INFORMATION

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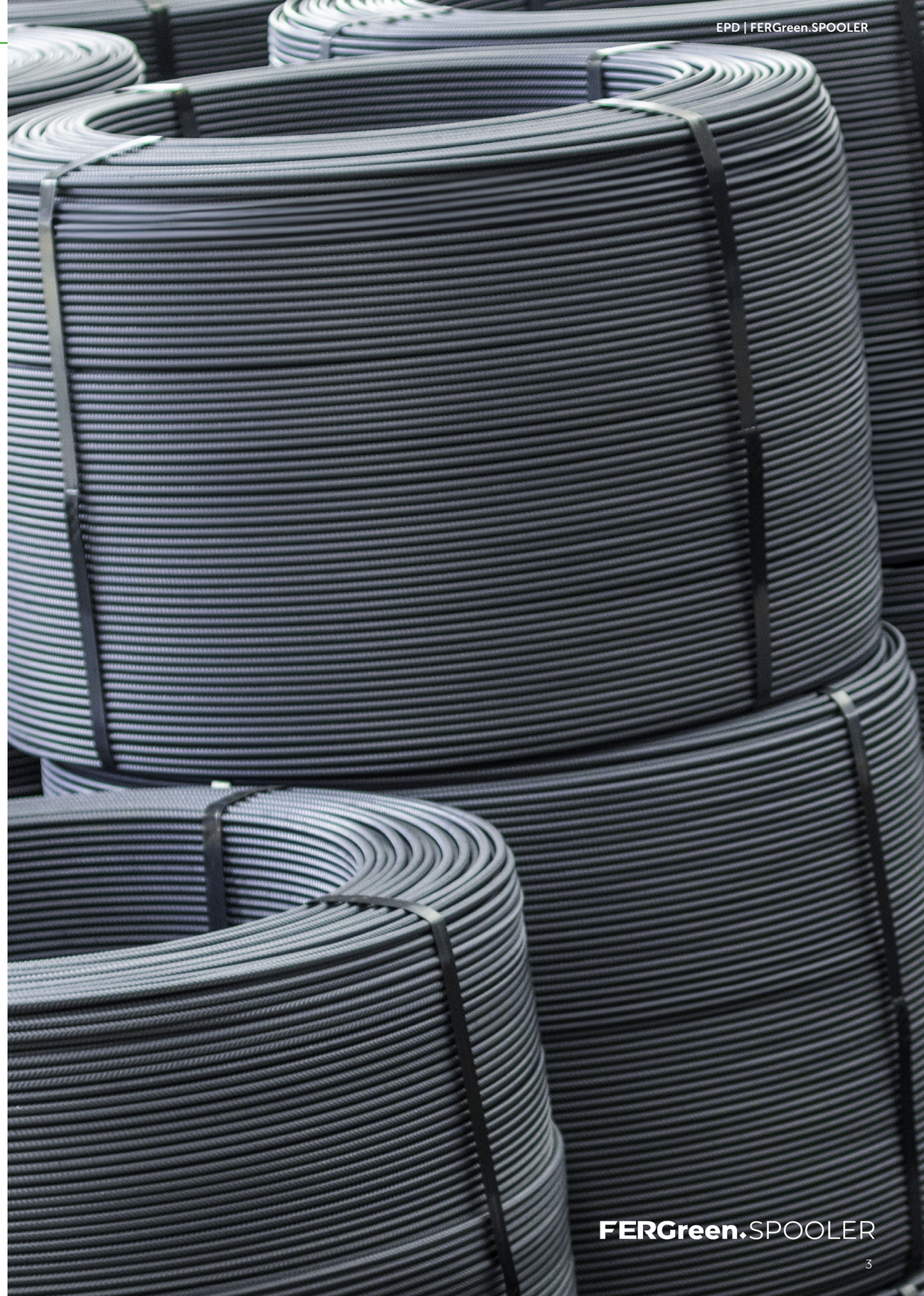
Technical support to Feralpi Group was provided by Life Cycle Engineering, Italy.
(info@lcengineering.eu, www.lcengineering.eu).



Company profile

THE FERALPI GROUP is one of Europe's leading manufacturers of steels for use in building construction.

The parent company Feralpi Siderurgica, which was set up in 1968 in Lonato del Garda, near Brescia, has developed steadily over the years to form a group of industries that currently more than 2.5 million tonnes of steel and rolled products a year, and has a workforce of more than 1900 permanent employees in Italy, Europe and North Africa.

In over fifty years of business, the company has branched out to foreign markets and have been able to face the challenge of an increasingly globalized steel industry. Starting from its lengthy tradition in steel manufacturing, the Group has developed according to a strategy of diversification into new products and markets, which has involved not only the internal organisation but also external transactions thanks to the acquisition of numerous enterprises operating in this industry. The Feralpi Group also operates in the field of special steels.

Since its very origins, Feralpi has focused not only on producing the best steel grades for building construction but also on doing it in the most sustainable possible way, which has involved reducing energy consumption and emissions by using the latest technology available or developing in-house new solutions covered by patents as a result of intensive innovation and research.

FERALPI GROUP | KEY FIGURES 2023*

2.4 million tons — STEEL PRODUCTION

>215 million euros — TOTAL GROSS VALUE ADDED 2023

78.3 million euros — EBITDA

>168 million euros — TECHNICAL INVESTMENTS BY THE GROUP

1,724.2 million euros — REVENUES 2023

>1 900 — EMPLOYEES (IT & ABROAD)

*all the data refer to the entire Feralpi Group

>80% — STRATEGIC INVESTMENTS WITH ESG SHARE

Lonato del Garda

Feralpi Siderurgica,
set up in
1968

Scope and Type of EPD

THE APPROACH USED IN THIS EPD IS "CRADLE-TO-GATE WITH OPTIONS", MODULES C1–C4, MODULE D AND WITH OPTIONAL MODULES (A4).
THE DATABASE USED IS CONSIDERED REPRESENTATIVE ON THE BASIS OF THE REPRESENTATIVENESS ANALYSIS CARRIED OUT WITH RESPECT TO THE DATA OF A REFERENCE PRODUCT OF THE EPD OWNER.

Table of modules

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		UTILISATION STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction 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	✓	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓	✓
geography	IT	IT	IT	EU	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU

SOFTWARE: SimaPro ver. 10.2.0.0
MAIN DATABASE: Ecoinvent 3.10
REPORT LCA: Life Cycle Assesment (LCA) applied to steel products for EPD purposes of a product recently on the market with limited data collection Rev. 03 29/04/2025
GEOGRAPHICAL SCOPE OF THE EPD: Europe according to sales market conditions
TYPE OF EPD: EPD of a product recently on the market with limited data collection based on multiple products

The product

The FERGreen.SPOOLER is a reinforcing steel in coils, hot-rolled and directly spooled. The product is produced at Feralpi plant in Lonato del Garda (BS), where it is hot-rolled, heat-treated from the rolling heat and directly spooled.

This is a new product, which is hot-rolled using process and induction heating. This enables a hot rolling process in which there is no need to heat the input material (Billets) to the required rolling temperature using natural gas. This makes the rolling process innovative, resource-saving and emission-free in Scope 1.

The main materials of the final product are: iron > 96%; alloy elements 2% c.a.; other elements complementary to 100%; for (post-consumer) recycled content see section Other optional additional environmental information.

Declared unit for the study is one tonne of FERGreen.Spooler - Reinforcing steel in coils, hot-rolled and directly spooled.

SVHC Information: The product does not contain any hazardous substance according to REACH Regulation.

INFORMATION	DESCRIPTION
PRODUCT IDENTIFICATION	Reinforcing Steel Coil
PRODUCT FEATURES	Weldable steel for reinforced concrete called SPOOLER: Diameters from 10 mm to 20 mm
PRODUCT PROPERTIES (ACCORDING TO EN 10080)	Weight from 3200 up to 5000 tons Adherence and surface geometry - for Ø 10 mm ≥ 0.052 - for Ø 12 mm to 20 mm ≥ 0.056
	Weldability: C_{eq} < 0.52
	Typical yield stress: Re or Rp0.2 > 450 MPa
	Elongation: Agt > 2,5%
	Successful in bend and rebend test
	Successful in Tensile strength test and Fatigue strength test
PLANT FEATURES	Period of production referred to 2023 for billets and february 2025 for new spooler VCC hot rolling mill
	On-site air emission control system
	On-site system to recycle process water
	On-site system to recycle water used in process
	In/out materials/products and melting process monitored to prevent nuclear radiation
	In house photovoltaic plant of 625 kW peak capacity operating since 2011

Environmental performance

The detailed environmental performance (in terms of use of resources, pollutant emissions and waste generation) is presented for the three phases **Upstream, Core and Downstream** and related sub-phases (A1-A2-A3-A4-C1-C2-C3-C4-D). The numbers reported in the following tables are the outcome of rounding. For this reason total results could slightly differ from the sum of contributions of the different phases.
The energy sources behind the electricity grid used in manufacturing is a mix between italian residual mix 2022 and 2023 and renewable energy with Guarantees of Origin related network losses and transformation. Final emission factor is 0,13 kg CO_2 eq./kWh.
The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Environmental impacts per declared unit

	UNITS	UPSTREAM - CORE PROCESS	DOWNSTREAM					
		A1:A3	A4	C1	C2	C3	C4	D
GWP	kg CO_2 eq	3,48E+02	4,54E+01	5,29E+01	1,81E+01	2,29E+00	2,72E-01	7,10E+01
GWP,f	kg CO_2 eq	3,47E+02	4,53E+01	5,29E+01	1,81E+01	2,28E+00	2,72E-01	7,11E+01
GWP,b	kg CO_2 eq	4,71E-01	4,29E-03	2,06E-03	6,24E-04	1,91E-03	2,01E-05	-8,11E-02
GWP,luluc	kg CO_2 eq	1,10E+00	4,91E-03	1,82E-03	4,49E-04	3,72E-03	1,11E-05	-1,03E-03
ODP	kg CFC-11 eq	4,74E-06	9,10E-07	8,32E-07	3,73E-07	1,54E-08	4,02E-09	1,05E-07
AP	mol H+ eq	1,20E+00	2,27E-01	4,95E-01	3,46E-02	1,11E-02	2,47E-03	2,34E-01
EP,f	kg P eq	8,87E-03	1,54E-04	5,00E-05	1,53E-05	1,10E-04	9,77E-07	-7,74E-03
EP,m	kg N eq	2,82E-01	5,91E-02	2,33E-01	1,17E-02	2,14E-03	1,12E-03	2,96E-02
EP,t	mol N eq	3,12E+00	6,53E-01	2,55E+00	1,28E-01	2,36E-02	1,23E-02	6,23E-01
POCP	kg NMVOC eq	1,19E+00	2,43E-01	7,58E-01	6,44E-02	7,18E-03	3,72E-03	1,82E-01
ADP,e*	kg Sb eq	2,04E-04	1,45E-06	2,21E-06	6,04E-07	6,41E-08	1,07E-08	1,03E-03
ADP,f*	MJ	4,23E+03	6,19E+02	6,97E+02	2,41E+02	3,09E+01	3,49E+00	5,68E+02
WDP*	m³	3,98E+02	5,64E-01	5,50E-01	1,03E-01	3,82E-01	3,16E-03	-1,03E+01

GWP Global warming potential, total
GWP,f Global warming potential, fossil
GWP,b Global warming potential, biogenic
GWP,luluc Global warming potential, land use & land use change
ODP Ozone depletion potential

AP Acidification potential
EP,f Eutrophication potential, freshwater
EP,m Eutrophication potential, marine
EP,t Eutrophication potential, terrestrial
POCP Photochemical ozone creation potential

ADP,e Abiotic depletion potential minerals & metals*
ADP,f Abiotic depletion potential fossil fuels*
WDP Water use deprivation potential*

Environmental performance

>>Produce and grow with respect for the people and the environment.<<

Carlo N. Pasini | Founder of the Feralpi Group

Resource use per declared unit

	UNITS	UPSTREAM - CORE PROCESS	DOWNSTREAM					
		A1:A3	A4	C1	C2	C3	C4	D
PERE	MJ	2,32E+03	8,64E+00	1,53E+00	8,38E-01	4,50E+00	1,54E-02	8,09E+01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,32E+03	8,64E+00	1,53E+00	8,38E-01	4,50E+00	1,54E-02	8,09E+01
PENRE	MJ	4,21E+03	6,19E+02	6,97E+02	2,41E+02	3,09E+01	3,49E+00	5,68E+02
PENRM	MJ	1,33E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,23E+03	6,19E+02	6,97E+02	2,41E+02	3,09E+01	3,49E+00	5,68E+02
SM	kg	1,10E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m³	1,05E+01	3,88E-02	2,18E-02	6,19E-03	1,61E-02	1,21E-04	-4,42E-01

Additional environmental impact indicators are computed in the LCA report but not reported in the EPD.
*The results of this enviromental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

It is not recommended to use results of modules A1-A3 without considering also module C.

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 non-renewable primary energy resources used as raw materials

PENRT Total use of non-renewable primary energy resources
SM Use of secondary raw materials
RSF Use of renewable secondary fuels
NRSF Use of non-renewable secondary fuels
FW Use of net fresh water

Environmental performance

Output flows and waste categories per declared unit

	UNITS	UPSTREAM - CORE PROCESS	DOWNSTREAM					
		A1:A3	A4	C1	C2	C3	C4	D
HWD	kg	4,29E+01	3,16E-02	3,67E-02	4,97E-03	7,95E-02	5,01E-04	3,78E+01
NHWD	kg	1,51E+02	9,27E-01	6,97E-01	3,50E-01	1,11E-01	1,00E+02	-1,21E+03
RWD	kg	7,47E-03	2,64E-04	3,56E-05	2,27E-05	8,73E-05	2,14E-07	-2,51E-04
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	1,83E+02	0,00E+00	0,00E+00	0,00E+00	9,00E+02	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD Hazardous waste disposed
NHWD Non-hazardous waste disposed
RWD Radioactive waste disposed
CRU Components for re-use
MFR Materials for recycling
MER Materials for energy recovery
EE Exported energy

Calculation rules

The environmental burden of the product has been calculated according to EN 15804:2012+A2:2019 and PCR ICMQ001/15 for construction products (Rev. 3.1, 12/11/2024).
This declaration is a Cradle-to-Gate with options, modules C1–C4, module D and with optional modules (A4) EPD type, based on the application of Life Cycle Assessment (LCA) methodology to the whole life-cycle system.

In the whole LCA model, infrastructures and production equipments are not taken into account.

FERGreen.SPOOLER is described by using specific data from manufacturing facility (FERALPI GROUP, Via Nicola Pasini 11, 25017 Lonato, Brescia - Italy) during whole year 2023 for the refining and steelshop departments, and from February 2025, for the rolling mill.
Primary data used is considered representative based on the representativeness analysis conducted in comparison to data from similar products of the EPD Owner.

Customized LCA questionnaires were used to gather in-depth information about all aspects of the production system (for example, raw materials contents and specifications, pre-treatments, process efficiencies, air and water emissions, waste management), in order to provide a complete picture of the environmental burden of the system from raw materials supply (A1) to Transport (A2) and Manufacturing (A3). The use phase was not considered according to EN:15804 and PCR ICMQ001/15, while transport to final destination (A4) and end of life (C1-C2-C3-C4-D) were considered. Therefore, in nominal installation and operating conditions, no emissions to air nor to water shall occur.

According to ISO 14040 and 14044, allocation is avoided whenever possible by dividing the system into sub-systems. When allocation cannot be avoided physical properties are used to drive flow analysis. Due to the presence of co-products in steel mill, an economic allocation were used in that phase.

Scrap pre and post consumer has been modeled by adding environmental loads on pre-consumer with an economic allocation method.

The reference product for this study is the Steel Bars, that has its own EPD, produced in the hot rolling mill 1 at FERALPI Plant in Lonato.

Data quality has been assessed and validated during data collection process.
According to EN:15804 the applied cut-off criterion for mass and energy flows is 1%.

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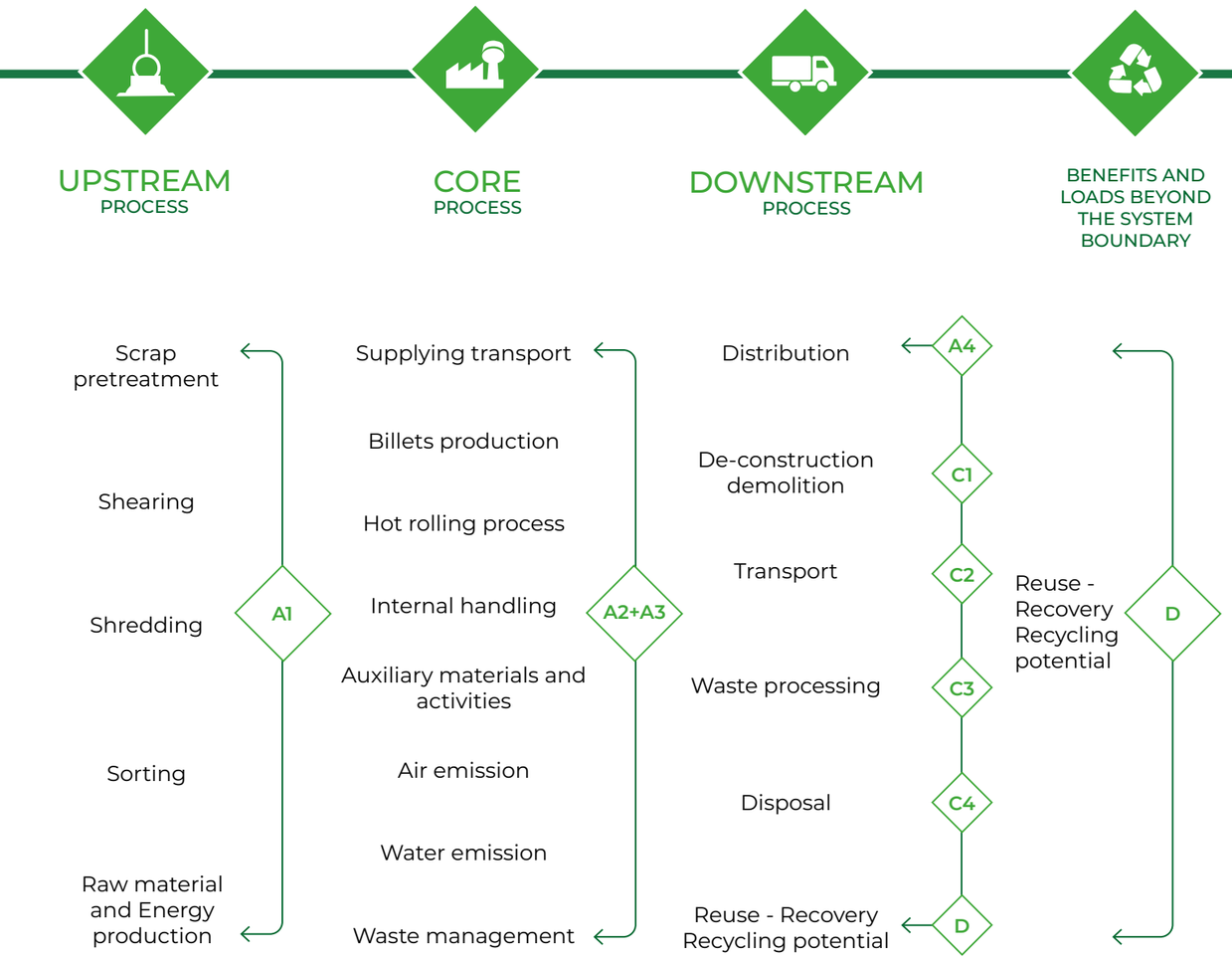
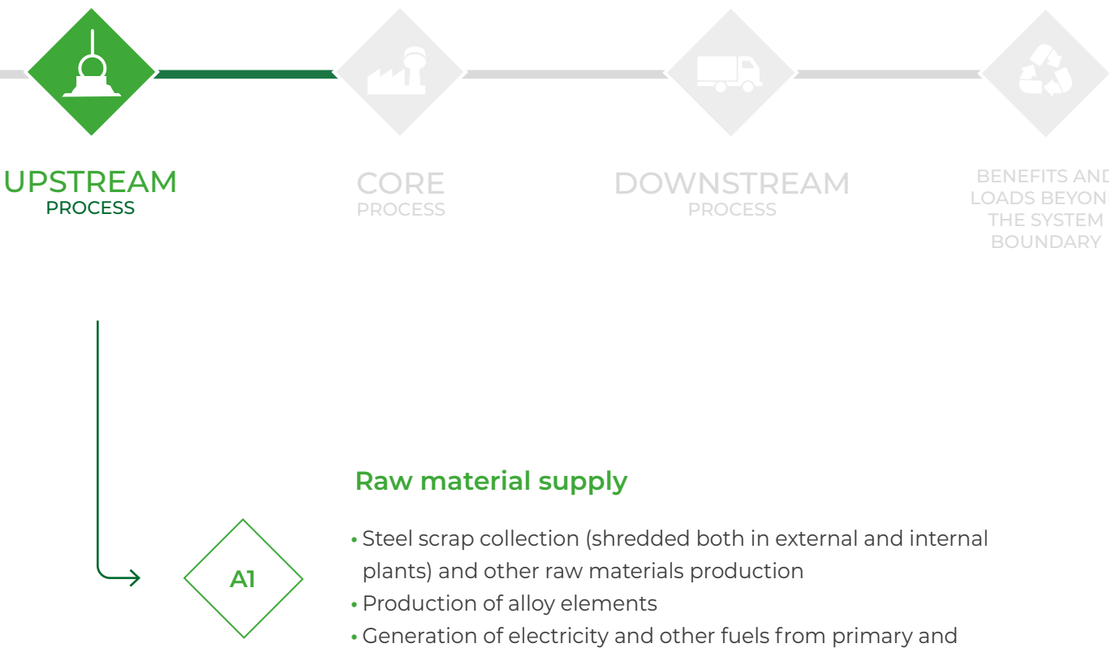
Scenarios and additional technical information



Broad scheme of hot rolled steel production, in which the main activities included in the system boundaries are listed and divided in the three subsystems: **UPSTREAM Process**, **CORE Process** and **DOWNSTREAM Process**.

Upstream process



Raw material supply

- Steel scrap collection (shredded both in external and internal plants) and other raw materials production
- Production of alloy elements
- Generation of electricity and other fuels from primary and secondary energy resources (excluding waste treatments)
- Specific secondary material pre-treatments, where appropriate

Core process

A2

Transportation

- Raw material transportation from production or collection facilities to the production plant

A3

Manufacturing

- Steel mill production, including utilities
- Rolling mill B production, including utilities
- Treatment of waste generated from the manufacturing processes

Downstream process

A4

Distribution

Transport to the customers (general market average).
Distances estimated considering the transported quantities and the distances from Lonato del Garda (BS) plant to the client.

Final products are delivered to many national and international countries.
On average, finished product is transported for 499,6 km by road, for 80,9 km by train and for 530,7 km by ship

C1

Deconstruction/Demolition

Dismantling and demolition operations required to remove the product from the building. Initial onsite sorting of the materials is included as well.
A consumption of diesel has been considered to characterise the dismantling operations.

Downstream process

C2

Transport

Transportation of the discarded product as part of the waste processing (to recycling site or to a final disposal site), 50 km by truck for non-hazardous waste to landfill and 250 km to recycling.
The transportation by truck has been calculated considering a >32 tons range.
The environmental class considered is EURO6.

C3

Waste processing

Waste processing, including collection of waste fraction from deconstruction and waste processing of material flows intended for reuse, recycling and energy recovery.
- Recycling rate: 90% (global steel recovery rate for the construction sector extracted from World Steel 2021 data[1])
- Consequently, the percentage of dumped steel slab is 15%

[1] World Steel, “Fact sheet – Steel and raw materials”, March 2023

C4

Disposal

Waste disposal including physical pre-treatment and management of the disposal site.

Benefits and loads beyond the system boundary

D

Reuse - Recovery - Recycling potential

Environmental impacts associated to waste use after the investigated system (including recycling).
In this module impacts arising from steel recycling are accounted, including avoided impacts associated to primary steel production. The result is expressed as net value between direct impact (i.e. recycling steel in EAF furnace) and avoided impact (i.e. producing steel from iron ore in BOF furnace).
The Amount of recovered steel is equal to C3 value while recycled content equal to amount of recycled material in the product is 99%.

Other optional additional environmental information

Feralpi’s commitment to sustainability is demonstrated by system certifications, which attest to the adoption of environmentally and socially friendly practices and processes, ensuring a systemic integration between economic development and environmental responsibility. Below are the certifications held by the Feralpi Siderurgica plant where the Spooler product is manufactured:

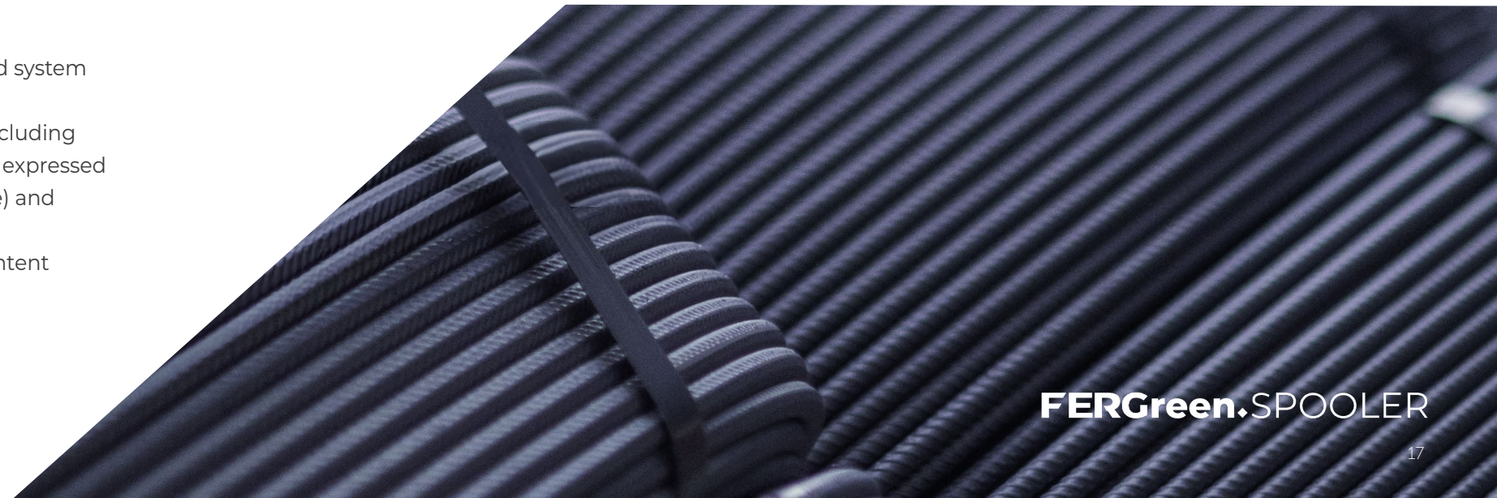
- UNI ISO 14001;

- EMAS;

- UNI ISO 45001;

- UNI ISO 50001.

Concerning the reduction of carbon dioxide emissions, the Feralpi Group has set ambitious decarbonisation objectives by 2030, using the methodologies imposed by SBTi, one of the most prestigious bodies at international level for the reduction of climate-changing emissions using a scientific approach.



››Produce and grow with respect for the people and the environment.‹‹

Carlo N. Pasini | Founder of the Feralpi Group

References

- EN 15804:2012+A2:2019
- ISO 14040 and 14044:2006
- EPDItaly Regulation: Rev. 6.0, 30/10/2023 - Annex 5 EPD of a product recently on the market with limited data collection
- Life Cycle Assesment (LCA) applied to steel products for EPD purposes of a product recently on the market with limited data collection Rev. 03 29/04/2025
- PCR ICMQ001/15 for construction products (Rev. 3.1, 12/11/2024)
- JRC EF package v3.1

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