FERALPI STAHL

FERGreen.

Environmental Product Declaration

FERGreen.SPOOLER

REINFORCING STEEL IN COILS, HOT ROLLED AND DIRECTLY SPOOLED

EPD OF A PRODUCT RECENTLY ON THE MARKET

Pogram Operator:
EPDItaly

Declaration N°:
ESF_001

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2025-04-30

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

ESF ELBE-STAHLWERKE FERALPI GMBH, GRÖBAER STRASSE 3, 01591 RIESA

EPD ITALY

ECO PLATFORM EPD VERIFIED

General information

EPD OWNER

NAME OF THE COMPANY: ESF ELBE-STAHLWERKE FERALPI GMBH, GRÖBAER STRASSE 3, 01591 RIESA

REGISTERED OFFICE: ESF ELBE-STAHLWERKE FERALPI GMBH, GRÖBAER STRASSE 3, 01591 RIESA
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): GRÖBAER STRASSE 3, 01591 RIESA

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 ESF Elbe-Stahlwerke Feralpi GmbH in the new rolling mill B, where it is hot-rolled, heat-treated from the rolling heat and directly spooled.

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

PRODUCT REFERENCE STANDARD: DIN 488

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

PROJECT REPORT LCA: Life Cycle Assesment (LCA) applied to FERGreen Spooler - Reinforcing steel in coils, hot rolled and directly spooled (Rev. 01, 10/04/2025)

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 Stahl 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 infrastructure and construction.

The German site of the Feralpi Group, **ESF ELBE-STAHLWERKE FERALPI GMBH** (ESF), has developed into a company with a wide range of products in the field of reinforcement steel since it was founded in 1992. Through constant modernisation of our facilities, our products guarantee a high standard of quality parameters so that we can meet the requirements of our customers. ESF is continuously monitoring developments in the reinforcement steel sector in the future and incorporate them into innovative technologies and production processes. This serves not least to strive for and fulfill the goal of continuously improving our efficiency in terms of processes and resources - and thus the environmental performance of our business activities. In addition to the production areas of steelworks, rolling mill A, rolling mill B and wire processing, there is also the plant logistics department (including the connecting railway), which is responsible for all internal and external loading processes.

The steel produced by ESF Elbe-Stahlwerke Feralpi GmbH is made exclusively from scrap with the EAF route. Utilising scrap as a raw material for steel production makes an important contribution to conserving natural resources.

The management systems implemented at the entire company site have been merged into an Integrated Management System (IMS) since 2015. The IMS includes the requirements of the standards DIN EN ISO 9001, DIN EN ISO 14001, EMAS III, and DIN EN ISO 50001 as well as the monitoring of the specialised waste management company in accordance with Sections 56 and 57 KrWG and, in addition to ESF, also includes Feralpi Stahlhandel GmbH and Feralpi-Logistik GmbH.

Environmental protection, energy efficiency and the circular economy determine the production processes. New technologies, environmental protection and energy efficiency measures are consistently implemented. The basis for the continuous improvement of environmental performance is a functioning environmental and energy management system that integrates all processes and stakeholders: from waste avoidance to reducing energy consumption.

For EPD purposes: ISO standard ISO 21930 compliance has been included in order to allow the selling outside Europe.

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 (DE & ABROAD)

*all the data refer to the entire Feralpi Group

>80% — STRATEGIC INVESTMENTS WITH ESG SHARE

Riesa

ESF Elbe-Stahlwerke Feralpi GmbH
established in **1992**

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	DE	DE	DE	EU	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU

SOFTWARE: SimaPro ver. 10.1.0.3
MAIN DATABASE: Ecoinvent 3.10
REPORT LCA: Life Cycle Assesment (LCA) applied to FERGreen Spooler - Reinforcing steel in coils, hot rolled and directly spooled (Rev. 01, 10/04/2025)
GEOGRAPHICAL SCOPE OF THE EPD: Europe according to sales market conditions
TYPE OF EPD: EPD of a product recently on the market based on multiple products with average results for product group

The product

The FERGreen.SPOOLER is a reinforcing steel in coils, hot-rolled and directly spooled. The product is produced at ESF Elbe-Stahlwerke Feralpi GmbH in the new rolling mill B, where it is hot-rolled, heat-treated from the rolling heat and directly spooled.

This is a new product, which is hot-rolled in the new rolling mill B 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 DESCRIPTION	Reinforcing steel in coils, hot rolled and directly spooled. The product can be used as an alternative to reinforcing steel in bars and can be cut and bent to the required length.
STEEL GRADE	B500B and B500SP
TENSILE STRENGTH	≥ 500 MPa
RATIO RM/RE	min. 1,08 (B500B); min. 1,15 (B500SP)
PRODUCTION ROUTE	EAF
STANDARD	DIN 488 and other international standards
DIAMETER RANGE	B500SP: 12 mm, 14 mm, 16 mm, 20 mm

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 German Supplier mix 2023 and renewable energy with Guarantees of Origin related network losses and transformation. The impact of the electricity mix used in module A3 expressed through the GWP-GHG indicator is 0.116 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	2.96E+02	2.94E+01	5.88E+01	1.73E+01	2.16E+00	4.07E-01	1.75E+02
GWP,f	kg CO_2 eq	2.95E+02	2.94E+01	5.88E+01	1.73E+01	2.16E+00	4.07E-01	1.75E+02
GWP,b	kg CO_2 eq	2.99E-01	2.11E-03	2.29E-03	5.97E-04	1.81E-03	3.02E-05	3.09E-03
GWP,luluc	kg CO_2 eq	1.24E-01	1.16E-03	2.02E-03	4.29E-04	3.51E-03	1.67E-05	-4.46E-03
ODP	kg CFC-11 eq	3.01E-06	6.11E-07	9.25E-07	3.57E-07	1.45E-08	6.04E-09	7.28E-07
AP	mol H+ eq	1.03E+00	4.66E-02	5.49E-01	3.31E-02	1.05E-02	3.70E-03	6.45E-01
EP,f	kg P eq	9.93E-03	5.55E-05	5.55E-05	1.47E-05	1.04E-04	1.46E-06	7.36E-03
EP,m	kg N eq	2.50E-01	1.38E-02	2.58E-01	1.12E-02	2.02E-03	1.68E-03	1.31E-01
EP,t	mol N eq	2.80E+00	1.51E-01	2.83E+00	1.23E-01	2.23E-02	1.84E-02	1.53E+00
POCP	kgNMVOCeq	9.12E-01	9.14E-02	8.42E-01	6.16E-02	6.79E-03	5.57E-03	5.33E-01
ADP,e*	kg Sb eq	2.27E-04	9.99E-07	2.46E-06	5.77E-07	6.05E-08	1.61E-08	1.51E-03
ADP,f*	MJ	3.38E+03	3.98E+02	7.74E+02	2.31E+02	2.92E+01	5.23E+00	1.60E+03
WDP*	m^3	6.55E+01	1.74E-01	6.11E-01	9.81E-02	3.61E-01	4.74E-03	1.35E+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	2.35E+03	2.17E+00	1.70E+00	8.02E-01	4.25E+00	2.30E-02	8.64E+01
PERM	MJ	1.32E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.35E+03	2.17E+00	1.70E+00	8.02E-01	4.25E+00	2.30E-02	8.64E+01
PENRE	MJ	3.38E+03	3.98E+02	7.74E+02	2.31E+02	2.92E+01	5.23E+00	1.60E+03
PENRM	MJ	2.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.38E+03	3.98E+02	7.74E+02	2.31E+02	2.92E+01	5.23E+00	1.60E+03
SM	kg	1.05E+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	m^3	1.61E+01	1.15E-02	2.42E-02	5.92E-03	1.52E-02	1.81E-04	3.39E-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

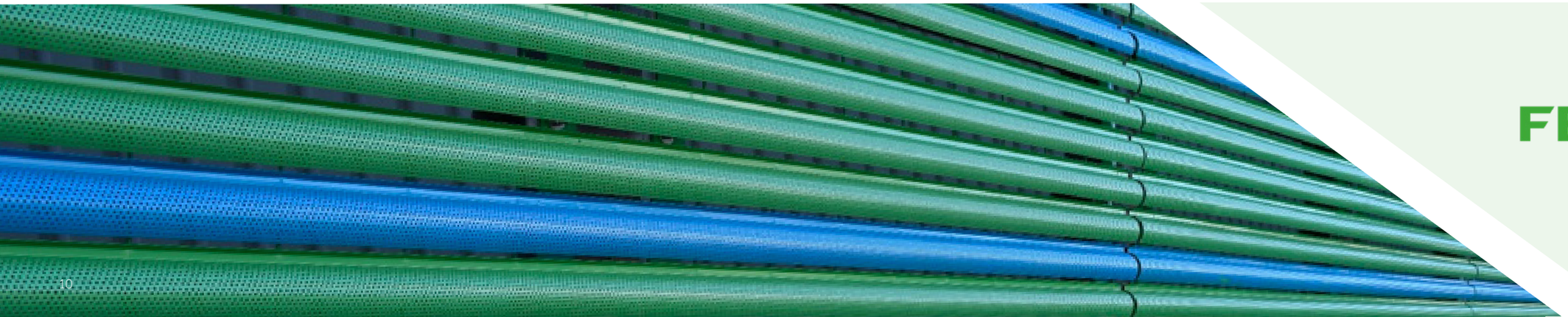
PENRT Total use of non-renewable primary energy resources
SM Use of secondary raw materials
RSF Use of renewable secondary fuels
NRSF Use of non-renewable secondary fuels
FW Use of net fresh water

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	3.77E+01	8.92E-03	4.08E-02	4.75E-03	7.51E-02	7.51E-04	4.39E+01
NHWD	kg	1.14E+02	5.92E-01	7.74E-01	3.34E-01	1.05E-01	1.50E+02	1.52E+02
RWD	kg	3.76E-03	5.24E-05	3.95E-05	2.17E-05	8.25E-05	3.20E-07	-1.85E-03
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	3.11E+02	0.00E+00	0.00E+00	0.00E+00	8.50E+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 (Elbe-Stahlwerke Feralpi GmbH, Gröbaer Straße 3, 01591 Riesa) during January 2025 (January 1, to January 31) for the refining and steelshop departments, and from March 1 to March 18, 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 Wire Rod, that has its own EPD, produced in the hot rolling mill A at ESF Feralpi Stahl.

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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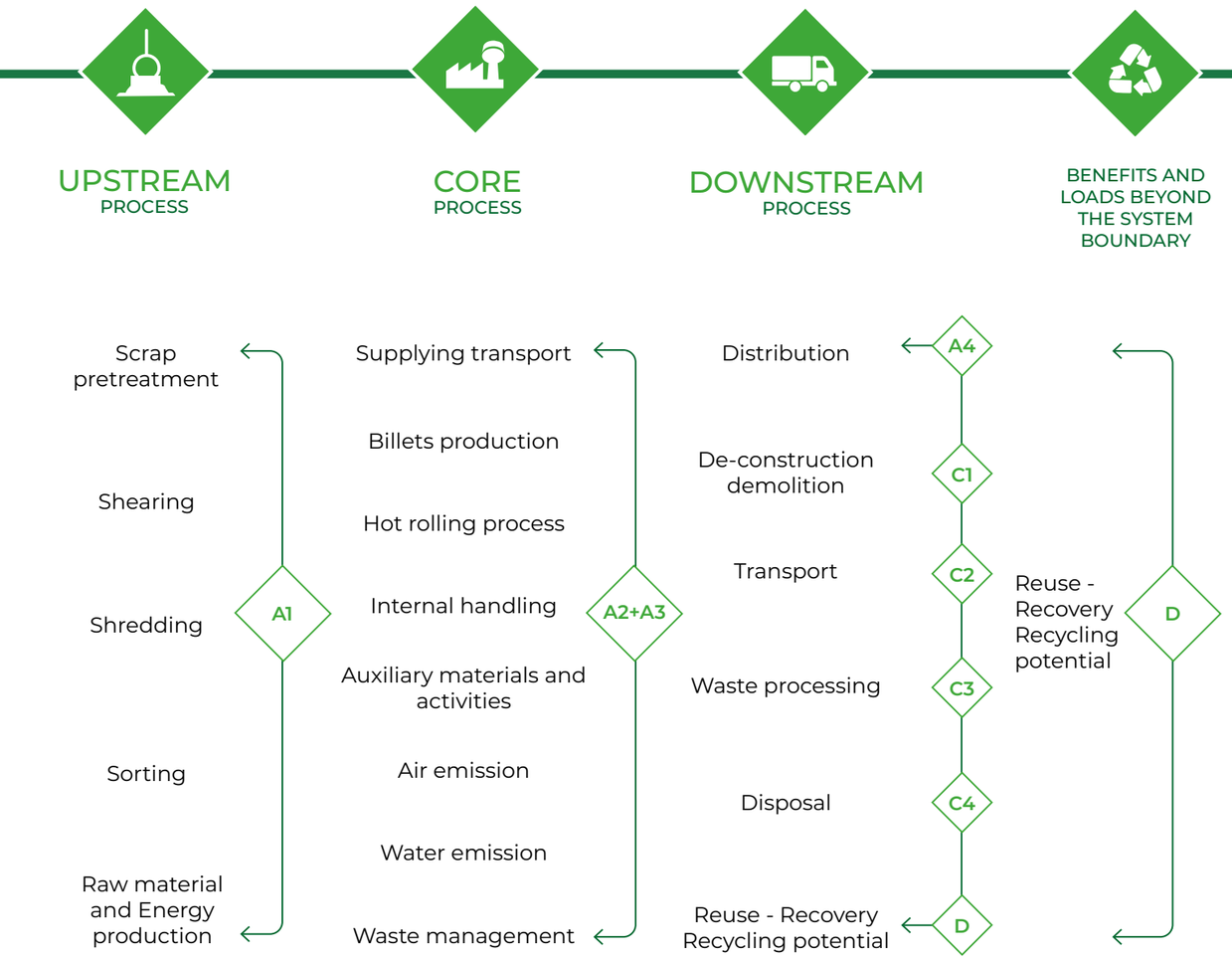
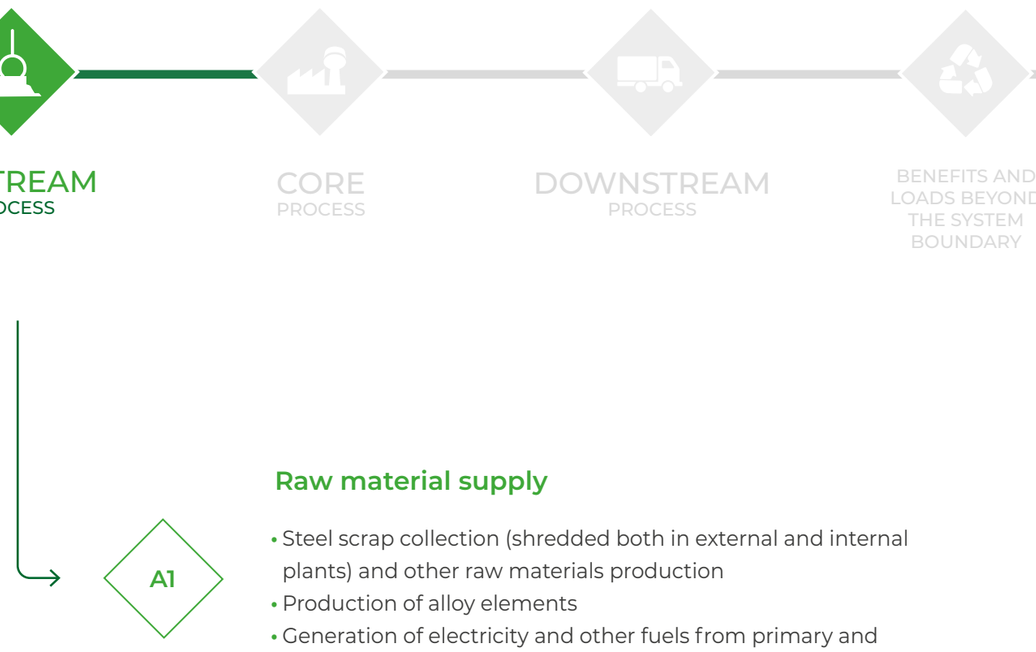
Scenarios and additional technical information



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 ESF Elbe-Stahlwerke Feralpi GmbH 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: 85% (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

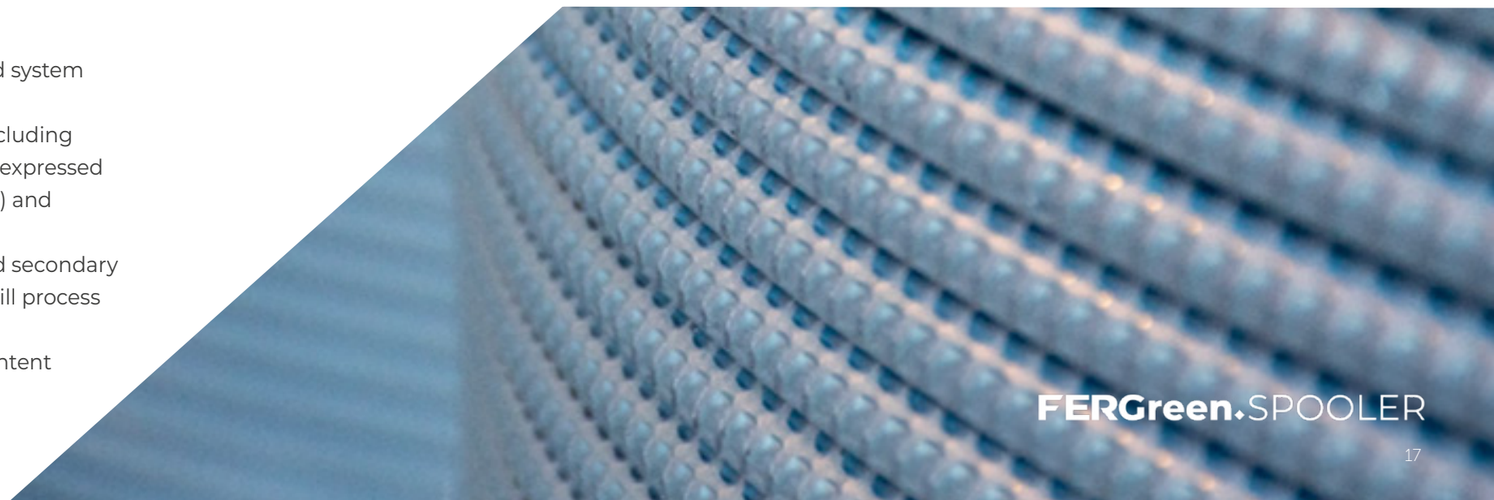
Environmental impacts associated to waste use after the investigated system (including recycling).
In this module impacts arising from steel recycling are accounted, including avoided impacts associated to primary steel production. The result is expressed as net value between direct impact (i.e. recycling steel in EAF furnace) and avoided impact (i.e. producing steel from iron ore in BOF furnace).
The hot-rolling impact has also been considered for both primary and secondary steel. Then calculated by multiplying the steel by the average steel mill process yield (in this case equal to 87%).
The Amount of recovered steel is equal to C3 value while recycled content equal to amount of recycled material in the product is 97,1%.

Other optional additional environmental information

Strategic projects to improve process efficiency and environmental performance: New **resource-saving hot rolling mill** (rolling mill B) with inductive billet heating furnace, new **scrap processing** for more efficient scrap utilisation and production process, new **transformer station** in which the use of the usual sulphur hexafluoride (SF 6) can be completely dispensed, new **logistics concept** for faster and more efficient processing of logistics orders.

MINIMUM CONTENT OF RECYCLED, RECOVERED, BY-PRODUCT MATERIALS								
PRODUCT TYPE	PRODUCT NAME	RECYCLED MATERIAL			RECOVERED MATERIAL	BY-PRODUCT MATERIAL		TOTAL CONTENT OF RECYCLED, RECOVERED, BY-PRODUCT MATERIAL
		Total	Pre-consumer	Post-consumer		Internal	External	
		[%]	[%]	[%]	[%]	[%]	[%]	[%]
REINFORCING STEEL IN COILS, HOT ROLLED AND DIRECTLY SPOOLED	FERGreen Spooler	97,1%	7,4%	89,7%	0	1,6%	0	**98,70%**

Recycled content calculated according to ICMQ CP DOC 262 regulation and according to ISO 14021 referred to 2024 year. Number P605, expiring date 27/04/2026



››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
- UNI EN ISO 14021:2021
- Life Cycle Assesment (LCA) applied to FERGreen Spooler - Reinforcing steel in coils, hot rolled and directly spooled (Rev. 01, 10/04/2025)
- EPDItaly Regulation, Rev. 6.0, 30/10/2023
- PCR ICMQ001/15 for construction products (Rev. 3.1, 12/11/2024)
- JRC EF package v3.1

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