



# ENVIRONMENTAL PRODUCT DECLARATION

## SPECIAL STEEL - SBQ BARS



### Based on PCR

PCR 2019:14  
Construction products  
v 1.11, 2021-02-05

EN:15804:2012+A2:2019

ISO 14025

### Certification N°

S-P:XXXX

### CPC Code

41

### Issue date

YYYY-MM-DD

### Revision date

YYYY-MM-DD

### Programme:

The International  
EPD System  
[www.environdec.com](http://www.environdec.com)

### Valid until

YYYY-MM-DD

### Programme operator:

EPD International AB

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](http://www.environdec.com)

# GENERAL INFORMATION

## EPD REFERENCES

**EPD OWNER:** DONALAM SRL, STR. PRELUNGIREA BUCURESTI NR 162, 910001, CALARASI - ROMANIA

**PROGRAM OPERATOR:** EPD INTERNATIONAL AB, BOX 21060, SE-100 31 STOCKHOLM, SWEDEN; INFO@ENVIRONDEC.COM

## INDEPENDENT VERIFICATION

This declaration has been developed referring to the International EPD System, following the General Programme Instructions v 4.0; further information and the document itself are available at: [www.environdec.com](http://www.environdec.com). EPD document valid within the following geographical area: Italy and other countries worldwide according to sales market conditions.

ISO standard ISO 21930 and CEN standard EN 15804:2012+A2:2019 served as the core PCR  
 PCR 2019:14 Construction products, Version 1.11, 2021-02-05  
 PCR review was conducted by: The Technical Committee of the International EPD® System. See [www.environdec.com/TC](http://www.environdec.com/TC) 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](http://www.environdec.com/contact).

Independent verification of the declaration and data, according to EN ISO 14025 : 2010

**Third party verifier:** ICMQ SpA, via De Castilla, 10 20124 Milano ([www.icmq.it](http://www.icmq.it))  EPD process certification (Internal)  EPD verification (External)

**Accredited by:** Accredia  YES  NO  
 Procedure for follow-up during EPD validity involves third party verifier

Environmental declarations published within the same product category, but from different programmes may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804. EPD owner has the sole ownership, liability and responsibility of the EPD.

## CONTACTS

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Technical support to Beltrame Group was provided by Life Cycle Engineering, Italy.  
 ([info@studiolce.it](mailto:info@studiolce.it), [www.lceengineering.eu](http://www.lceengineering.eu)).



# THE COMPANY

The AFV Beltrame Group has operated in the steel industry for over a century, producing rolled sections for use in construction, shipyards, and excavators.

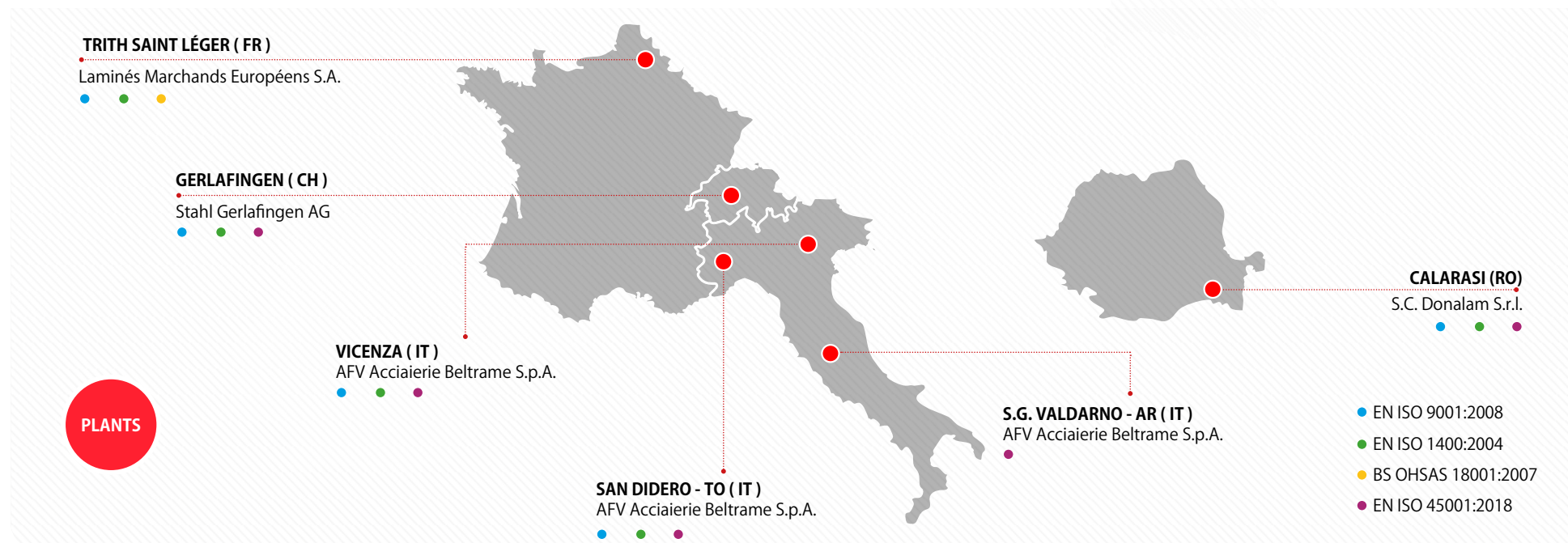
The facilities, which have a production capacity of approximately **3,2 million tons**, include three electric furnaces and ten rolling mills. These are scattered in six plants located in **Italy, France, Switzerland, and Romania.**

Their geographical distribution is very advantageous given the areas where the products are consumed and those where raw materials are purchased.

The AFV Beltrame Group is commercially present in all European markets as well as in the Mediterranean region through shares in local companies, agents, or the internal sales force. All employees, amounting to approximately **2,000 people**, are strongly committed

and motivated to satisfy the customers' needs through constant improvements in production, organization and level of service.

In order to support the principles in the code of ethics and the policy regarding **Quality, Health and Safety**, and the **Environment** (QHSE), all production plants have adopted an Integrated Management System.



# SCOPE AND TYPE OF EPD®

THE APPROACH USED IN THIS EPD IS “CRADLE TO GATE WITH OPTIONS” ONE

## TABLE OF MODULES

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
	Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	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
Module declared	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	RO	RO	RO	WLD	-	-	-	-	-	-	-	-	WLD	WLD	WLD	WLD	WLD
Specific data used	> 90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-products	< 10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-sites	NOT RELEVANT			-	-	-	-	-	-	-	-	-	-	-	-	-	-

**TYPE OF EPD® :** Product EPD®

**REPORT LCA:** Life Cycle Assessment (LCA) applied to Special steel - SBQ bars

**REFERENCE PERIOD:** 2020

**GEOGRAPHICAL SCOPE OF THE EPD:** World according to sales market conditions.

**AVERAGING:** Weighted on the plant production.

**SOFTWARE:** SimaPro ver. 9.2.0.1 (www.pre.nl)

**MAIN DATABASE:** Ecoinvent 3.6

Environmental declarations published within the same product category, though originating from different programs, may not be comparable.

# DETAILED PRODUCT DESCRIPTION

This EPD refers to special steel - SBQ bars, with and without thermal treatment, produced at **Calarasi (RO)** plant, with rolling mill process, starting from steel ingots acquired by external supplier varying steel grades, e.g. S355, C45, 42CrMo4 etc. This EPD covers 88'241 tons of SBQ bars production.

## CONTENT DECLARATION

MATERIAL	MASS SHARE
IRON	96 %
ALLOY ELEMENTS	2 %
OTHER ELEMENTS	2 %

- No packaging is required for functional unit delivery and distribution, and no renewable material is contained in functional unit

## PRODUCT DIMENSIONS AND SPECIFIC STANDARDS:

- » EN ISO 683-1:2018    » EN ISO 683-2:2018
- » EN 10025-2:2005    » Attestation of conformity system 2+ (CE marking)



PRODUCT	STANDARD	DIAMETER (mm)		SIZE (mm)	
		from	to	from	to
Round bars	EN 10060:2003	80	300	-	-
Square bars	EN 10059:2003	-	-	100	250

# ENVIRONMENTAL PERFORMANCE

The detailed environmental performance (in terms of potential environmental impacts, use of resources 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). Construction installation (A5) and use phase (B1 - B7) are modules not declared (MND).

**DECLARED UNIT (D.U.)** The declared unit is 1 tonne (1 000 kg) of special steel - SBQ bar

The following tables show the environmental performance of the two types of product identified as follows:

- SBQ BARS (without thermal treatment)
- SBQ TRT BARS (with thermal treatment)



# DONALAM - AFV BELTRAME GROUP - SBQ BARS

**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

**GWP,ghg** Global warming potential, excluding biogenic uptake, emission and storage

**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

**ADPE** Abiotic depletion potential minerals & metals\*









**ADPF** Abiotic depletion potential fossil fuels\*

**WDP** Water use deprivation potential\*

\*: The results of these environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Additional environmental impact indicators are computed in the LCA report but not reported in the EPD.









## ENVIRONMENTAL IMPACTS PER DECLARED UNIT

POTENTIAL ENVIRONMENTAL IMPACTS	UNITS / D.U.	UPSTREAM	CORE			DOWNSTREAM				TOTAL*	D
		A1 	A2 	A3 	A4 	C1 	C2 	C3 	C4 		
GWP	kg CO <sub>2</sub> eq	2,11E+03	3,99E+01	1,52E+02	2,38E+02	5,11E+01	2,60E+01	1,43E+01	1,26E-01	<b>2,63E+03</b>	-1,29E+03
GWP,f	kg CO <sub>2</sub> eq	2,11E+03	3,99E+01	1,52E+02	2,38E+02	5,11E+01	2,60E+01	1,43E+01	1,26E-01	<b>2,63E+03</b>	-1,29E+03
GWP,b	kg CO <sub>2</sub> eq	5,94E-02	2,11E-03	1,22E-02	1,29E-02	3,44E-03	1,41E-03	2,14E-02	1,67E-05	<b>1,13E-01</b>	-2,75E-01
GWP,luluc	kg CO <sub>2</sub> eq	1,29E-02	3,06E-04	1,12E-02	1,82E-03	7,48E-04	1,99E-04	8,14E-03	3,11E-06	<b>3,53E-02</b>	-1,32E-01
GWP,ghg	kg CO <sub>2</sub> eq	2,11E+03	3,99E+01	1,52E+02	2,38E+02	5,11E+01	2,60E+01	1,43E+01	1,26E-01	<b>2,63E+03</b>	-1,29E+03
ODP	kg CFC11 eq	1,53E-04	8,93E-06	1,04E-06	5,57E-05	1,15E-05	6,08E-06	2,53E-06	2,63E-08	<b>2,39E-04</b>	-3,99E-05
AP	mol H+ eq	1,84E+00	5,17E-01	1,86E-01	1,11E+00	5,52E-01	1,21E-01	1,23E-01	1,30E-03	<b>4,45E+00</b>	-4,85E+00
EP,f	kg P eq	8,83E-02	2,16E-05	2,97E-04	1,31E-04	3,82E-05	1,43E-05	4,23E-04	4,55E-07	<b>8,92E-02</b>	-5,46E-02
EP,m	kg N eq	3,37E-01	2,42E-01	8,12E-02	4,13E-01	2,47E-01	4,52E-02	4,80E-02	5,65E-04	<b>1,41E+00</b>	-9,89E-01
EP,t	mol N eq	3,69E+00	2,65E+00	8,94E-01	4,54E+00	2,71E+00	4,96E-01	5,27E-01	6,20E-03	<b>1,55E+01</b>	-1,08E+01
POCP	kg NMVOC eq	9,97E-01	7,01E-01	2,26E-01	1,18E+00	7,42E-01	1,29E-01	1,43E-01	1,73E-03	<b>4,12E+00</b>	-5,75E+00
ADPE	kg Sb eq	7,24E-02	1,61E-06	4,24E-06	1,02E-05	2,54E-06	1,11E-06	6,75E-07	5,83E-09	<b>7,24E-02</b>	-2,01E-02
ADPF	MJ	1,51E+04	5,45E+02	9,51E+01	3,40E+03	7,07E+02	3,71E+02	2,25E+02	1,68E+00	<b>2,05E+04</b>	-1,06E+04
WDP	m <sup>3</sup>	8,77E+02	-1,51E-01	2,98E+01	-7,24E-01	1,44E-01	-7,92E-02	8,08E-01	5,89E-04	<b>9,07E+02</b>	-1,13E+02

# DONALAM - AFV BELTRAME GROUP

## SBQ TRT BARS

### ENVIRONMENTAL IMPACTS PER DECLARED UNIT









POTENTIAL ENVIRONMENTAL IMPACTS	UNITS / D.U.	UPSTREAM	CORE			DOWNSTREAM				TOTAL*	D
		A1 	A2 	A3 	A4 	C1 	C2 	C3 	C4 		
GWP	kg CO <sub>2</sub> eq	2,22E+03	3,99E+01	1,52E+02	2,38E+02	5,11E+01	2,60E+01	1,43E+01	1,26E-04	<b>2,75E+03</b>	-1,29E+00
GWP,f	kg CO <sub>2</sub> eq	2,22E+03	3,99E+01	1,52E+02	2,38E+02	5,11E+01	2,60E+01	1,43E+01	1,26E-04	<b>2,75E+03</b>	-1,29E+00
GWP,b	kg CO <sub>2</sub> eq	9,81E-02	2,11E-03	1,22E-02	1,29E-02	3,44E-03	1,41E-03	2,14E-02	1,67E-08	<b>1,52E-01</b>	-2,75E-04
GWP,luluc	kg CO <sub>2</sub> eq	1,91E-02	3,06E-04	1,12E-02	1,82E-03	7,48E-04	1,99E-04	8,14E-03	3,11E-09	<b>4,14E-02</b>	-1,32E-04
GWP,ghg	kg CO <sub>2</sub> eq	2,22E+03	3,99E+01	1,52E+02	2,38E+02	5,11E+01	2,60E+01	1,43E+01	1,26E-04	<b>2,75E+03</b>	-1,29E+00
ODP	kg CFC11 eq	1,75E-04	8,93E-06	1,04E-06	5,57E-05	1,15E-05	6,08E-06	2,53E-06	2,63E-11	<b>2,61E-04</b>	-3,99E-08
AP	mol H+ eq	2,22E+00	5,17E-01	2,47E-01	1,11E+00	5,52E-01	1,21E-01	1,23E-01	1,30E-06	<b>4,89E+00</b>	-4,85E-03
EP,f	kg P eq	9,14E-02	2,16E-05	2,97E-04	1,31E-04	3,82E-05	1,43E-05	4,23E-04	4,55E-10	<b>9,24E-02</b>	-5,46E-05
EP,m	kg N eq	3,94E-01	2,42E-01	1,09E-01	4,13E-01	2,47E-01	4,52E-02	4,80E-02	5,65E-07	<b>1,50E+00</b>	-9,89E-04
EP,t	mol N eq	4,32E+00	2,65E+00	1,20E+00	4,54E+00	2,71E+00	4,96E-01	5,27E-01	6,20E-06	<b>1,64E+01</b>	-1,08E-02
POCP	kg NMVOC eq	1,19E+00	7,01E-01	3,00E-01	1,18E+00	7,42E-01	1,29E-01	1,43E-01	1,73E-06	<b>4,39E+00</b>	-5,75E-03
ADPE	kg Sb eq	7,24E-02	1,61E-06	4,24E-06	1,02E-05	2,54E-06	1,11E-06	6,75E-07	5,83E-12	<b>7,24E-02</b>	-2,01E-05
ADPF	MJ	1,80E+04	5,45E+02	9,51E+01	3,40E+03	7,07E+02	3,71E+02	2,25E+02	1,68E-03	<b>2,34E+04</b>	-1,06E+01
WDP	m <sup>3</sup>	8,93E+02	-1,51E-01	2,98E+01	-7,24E-01	1,44E-01	-7,92E-02	8,08E-01	5,89E-07	<b>9,23E+02</b>	-1,13E-01



# DONALAM AFV BELTRAME GROUP SBQ BARS

- 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

## RESOURCE USE PER DECLARED UNIT

USE OF RESOURCES	UNITS / D.U.	UPSTREAM	CORE			DOWNSTREAM				TOTAL*	D
		A1 	A2 	A3 	A4 	C1 	C2 	C3 	C4 		
PERE	MJ	8,65E+02	7,91E-01	8,56E+01	5,00E+00	1,12E+00	5,46E-01	1,29E+01	6,99E-03	<b>9,71E+02</b>	-9,36E+02
PERM	MJ	0,00E+00	0,00E+00	6,71E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>6,71E+01</b>	0,00E+00
PERT	MJ	8,65E+02	7,91E-01	1,53E+02	5,00E+00	1,12E+00	5,46E-01	1,29E+01	6,99E-03	<b>1,04E+03</b>	-9,36E+02
PENRE	MJ	2,08E+04	5,32E+02	9,67E+01	3,32E+03	6,92E+02	3,63E+02	2,39E+02	1,68E+00	<b>2,61E+04</b>	-1,58E+04
PENRM	MJ	0,00E+00	0,00E+00	5,77E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>5,77E+00</b>	0,00E+00
PENRT	MJ	2,08E+04	5,32E+02	1,02E+02	3,32E+03	6,92E+02	3,63E+02	2,39E+02	1,68E+00	<b>2,61E+04</b>	-1,58E+04
SM	kg	2,48E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>2,48E+02</b>	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	0,00E+00	<b>0,00E+00</b>	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	0,00E+00	<b>0,00E+00</b>	0,00E+00
FW	m <sup>3</sup>	1,99E+01	8,62E-03	7,12E-01	6,74E-02	1,78E-02	7,36E-03	6,89E-02	4,81E-05	<b>2,08E+01</b>	-1,71E+00









\*Totals may not correspond to the sum of the individual contributes due to approximations.

# DONALAM

## AFV BELTRAME GROUP

### SBQ TRT BARS

RESOURCE USE PER DECLARED UNIT









USE OF RESOURCES	UNITS / D.U.	UPSTREAM	CORE			DOWNSTREAM				TOTAL*	D
		A1 	A2 	A3 	A4 	C1 	C2 	C3 	C4 		
PERE	MJ	9,44E+02	7,91E-01	8,56E+01	5,00E+00	1,12E+00	5,46E-01	1,29E+01	6,99E-06	<b>1,05E+03</b>	-9,36E-01
PERM	MJ	0,00E+00	0,00E+00	6,71E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>6,71E+01</b>	0,00E+00
PERT	MJ	9,44E+02	7,91E-01	1,53E+02	5,00E+00	1,12E+00	5,46E-01	1,29E+01	6,99E-06	<b>1,12E+03</b>	-9,36E-01
PENRE	MJ	2,41E+04	5,32E+02	9,67E+01	3,32E+03	6,92E+02	3,63E+02	2,39E+02	1,68E-03	<b>2,94E+04</b>	-1,58E+01
PENRM	MJ	0,00E+00	0,00E+00	5,77E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>5,77E+00</b>	0,00E+00
PENRT	MJ	2,41E+04	5,32E+02	1,02E+02	3,32E+03	6,92E+02	3,63E+02	2,39E+02	1,68E-03	<b>2,94E+04</b>	-1,58E+01
SM	kg	2,48E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>2,48E+02</b>	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	0,00E+00	<b>0,00E+00</b>	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	0,00E+00	<b>0,00E+00</b>	0,00E+00
FW	m <sup>3</sup>	2,07E+01	8,62E-03	7,12E-01	6,74E-02	1,78E-02	7,36E-03	6,89E-02	4,81E-08	<b>2,16E+01</b>	-1,71E-03

\*Totals may not correspond to the sum of the individual contributes due to approximations.

# DONALAM AFV BELTRAME GROUP SBQ BARS

**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

## OUTPUT FLOWS AND WASTE CATEGORIES PER DECLARED UNIT

WASTE GENERATION AND TREATMENT	UNITS / D.U.	UPSTREAM	CORE			DOWNSTREAM				TOTAL*	D
		A1 	A2 	A3 	A4 	C1 	C2 	C3 	C4 		
HWD	kg	9,17E+00	0,00E+00	8,54E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>9,25E+00</b>	0,00E+00
NHWD	kg	2,24E+02	0,00E+00	2,17E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>2,26E+02</b>	0,00E+00
RWD	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>0,00E+00</b>	0,00E+00
CRU	kg	4,12E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>4,12E-02</b>	0,00E+00
MFR	kg	0,00E+00	0,00E+00	4,61E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>4,61E+01</b>	0,00E+00
MER	kg	0,00E+00	0,00E+00	1,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>1,64E-02</b>	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	0,00E+00	<b>0,00E+00</b>	0,00E+00









\*Totals may not correspond to the sum of the individual contributes due to approximations.

# DONALAM

## AFV BELTRAME GROUP

### SBQ TRT BARS

**OUTPUT FLOWS AND WASTE CATEGORIES PER DECLARED UNIT**

WASTE GENERATION AND TREATMENT	UNITS / D.U.	UPSTREAM	CORE			DOWNSTREAM				TOTAL*	D
		A1 	A2 	A3 	A4 	C1 	C2 	C3 	C4 		
HWD	kg	9,17E+00	0,00E+00	8,54E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>9,25E+00</b>	0,00E+00
NHWD	kg	2,24E+02	0,00E+00	2,17E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>2,26E+02</b>	0,00E+00
RWD	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>0,00E+00</b>	0,00E+00
CRU	kg	4,12E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>4,12E-02</b>	0,00E+00
MFR	kg	0,00E+00	0,00E+00	4,61E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>4,61E+01</b>	0,00E+00
MER	kg	0,00E+00	0,00E+00	1,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	<b>1,64E-02</b>	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	0,00E+00	<b>0,00E+00</b>	0,00E+00

\*Totals may not correspond to the sum of the individual contributes due to approximations.

# CALCULATION RULES

## METHODOLOGY

The environmental burden of the product has been calculated according to the GPI v.3.01 issued by the International EPD System<sup>1</sup> (Cradle to gate with options). This declaration is based on the application of Life Cycle Assessment (LCA) methodology to the whole life-cycle system.

Special steel - SBQ bars at plant level, was described by using specific data from manufacturing facility (Calarasi) for year 2020.

Customized LCA<sup>2</sup> questionnaires were used to gather in-depth information about all aspects of the production system (for example, raw materials specifications, pre treatments, process efficiencies, air emissions, waste management), ultimately providing 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 PCR, while transport to final destination (A4) and end-of-life phases (C1-C2-C3-C4-D) were considered. A distance of 200 km from operation plant and dismantling site was adopted. According to PEFCD a collection rate of 0,95 was adopted. Therefore, in nominal installation and operating conditions, no emissions to air nor to water shall occur.

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%.

<sup>1</sup>International EPD System is managed by EPD International AB ([www.environdec.com](http://www.environdec.com)).

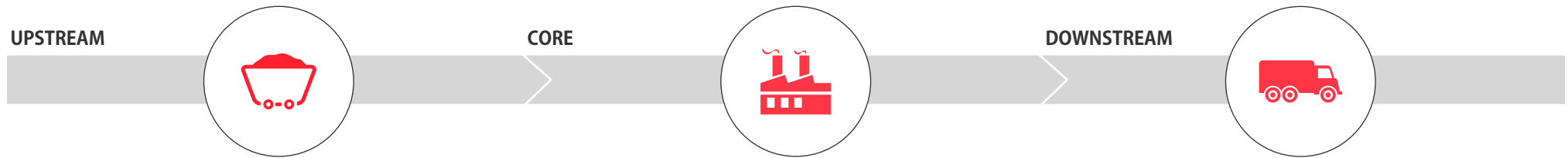
<sup>2</sup>The LCA methodology is standardized at international level by ISO 14040 and ISO 14044.

## DECLARED UNIT

Bars are usually traded in mass so that the declared unit is **1 ton of special steel - SBQ bar.**



# CALCULATION RULES

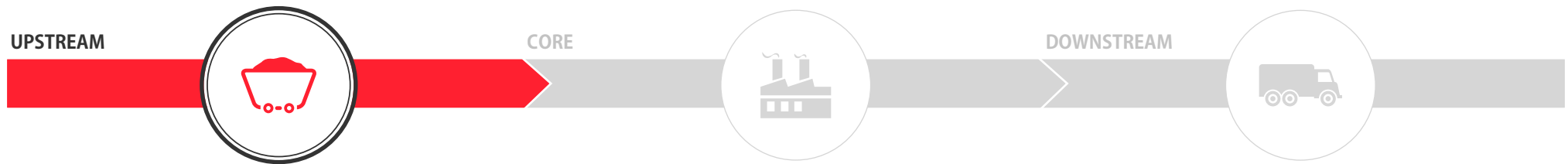


According to the PCR 2019:14 v. 1.11 the main activities are listed and divided in three subsystems: **UPSTREAM Process**, **CORE Module**, **DOWNSTREAM Process**

UPSTREAM PROCESS	CORE MODULE	DOWNSTREAM PROCESS
<p><b>Scrap pretreatment</b></p> <p>Demolition</p> <p>Shearing</p> <p><b>A1</b> Crushing</p> <hr/> <p><b>Material and energy ware production</b></p> <p>Other raw materials</p> <p>Energy</p>	<p>Supplying transport</p> <p>Hot rolling process</p> <p>Thermal treatment</p> <p>Packaging</p> <p><b>A2+A3</b> Internal handing</p> <p>Ancillary activities</p> <p>Air emission</p> <p>Water emission</p> <p>Wastes</p>	<p><b>A4</b> Distribution</p> <hr/> <p><b>C1</b> De-construction demolition</p> <hr/> <p><b>C2</b> Transport</p> <hr/> <p><b>C3</b> Waste processing</p> <hr/> <p><b>C4</b> Disposal</p> <hr/> <p><b>D</b> Reuse - Recovery - Recycling potential</p>

Figure 1. Scheme of the considered system boundaries (including upstream, core and downstream main processes).

# UPSTREAM PROCESS



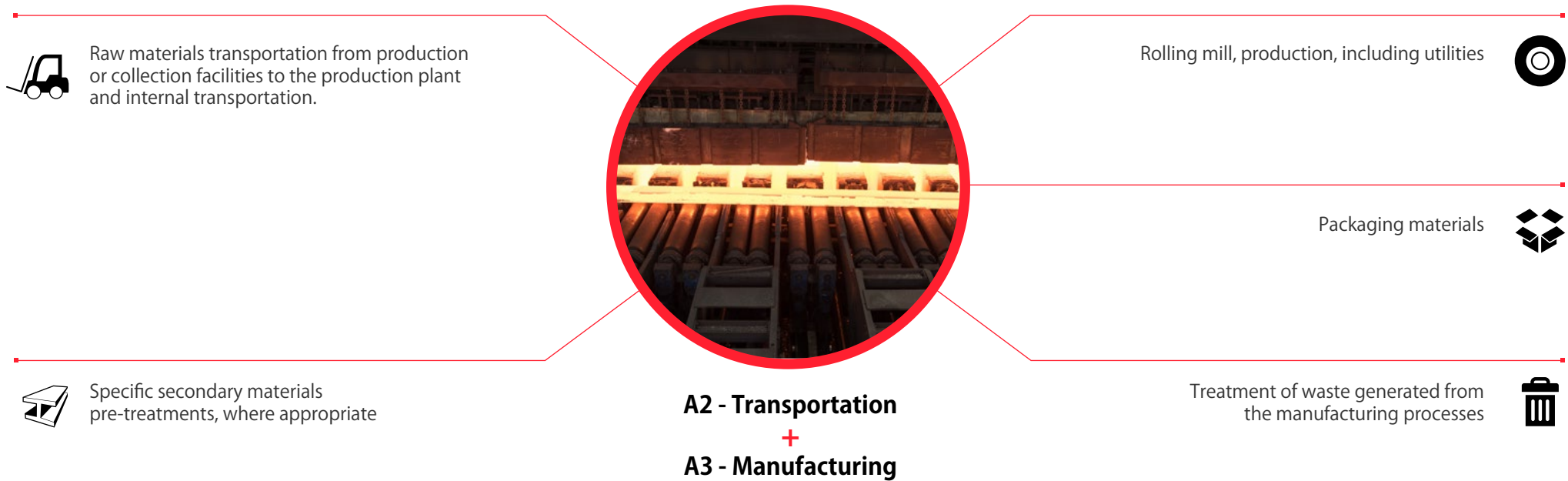
*Scheme of the considered system boundaries (upstream processes).*



# CORE PROCESS

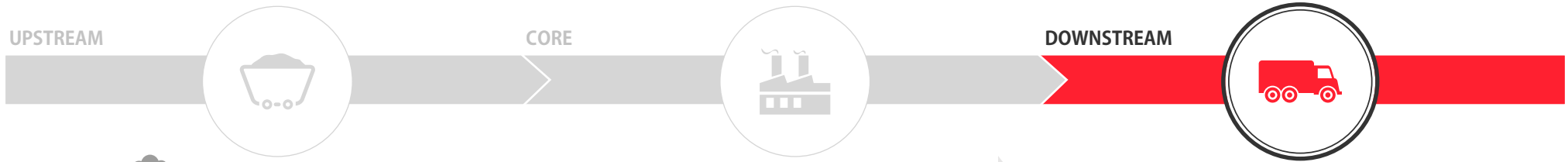


*Scheme of the considered system boundaries (core processes).*





# DOWNSTREAM PROCESS



## A4 Distribution

Transport to the customers (general market average). Distances estimated considering the transported quantities and the distances average from Calarasi plant to the client. Final products are delivered to many national and international areas.

## C1 De-construction demolition

Dismantling and demolition operations required to remove the product from the building. Initial onsite sorting of the materials is included as well.

## C2 Transport

Transportation of the discarded product as part of the waste processing (to recycling site or to a final disposal site).

## 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.

## C4 Disposal

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

## D Reuse - Recovery - Recycling potential

Environmental impacts associated to waste use after the investigated system (including recycling).

# ADDITIONAL INFORMATION

Main environmental characteristics of the considered plants are:

**1.** Prevention and reduction of air emission:

- automation and control of furnace combustion, recovery and use of low NOx burners
- the furnaces are equipped with temperature control zones and combustion installation with self-recovering burners
- air pollution monitoring for each campaign for all existing funnels, in the site, which fall within the limits of the actual environmental legislation and the recommendations for primary and secondary measures according to BAT to reduce pollutant emissions.
- preparation for the requirements of the new BAT. The company intends to replace the furnace with a new one that will reduce emissions and consumptions.

**2.** Minimisation of water consumption by using a recirculating water from wells, minimum 95% recirculated water. This is done by treatment system with filters, water's recirculation, decantation and cooling.

**3.** Waste management using the following techniques:

- I.** prevention of produced wastes by improving maintenance and operation, training and control
- II.** proper collection and storage to facilitate recovery
- III.** on-site recovery and recycling of wood waste coming from transports of raw materials (blooms), reused for the packaging of the delivered bars and sawdust waste that we recover for trees fertilization.
- IV.** separation of the scale in the water treatment process and external recovery to authorized external companies

**V.** external recovery for all ferrous metal wastes.

**VI.** recovery of oils and packaging from cardboard and plastics by authorized external companies

**VII.** Involving employees in waste management. Every year we implement environmental projects from employees which are awarded

**VIII.** a small part of the total waste that cannot be recycled is intended for the final disposal of authorized external companies.

**IX.** annual communication to customers related to the environment, health and safety and the sustainable life cycle of the product which can be recycled as scrap metal and steel.

**4.** Radioactivity monitoring of raw materials by means of detection equipment

**5.** Maintaining of the environmental certification in accordance with the standard SR EN ISO 14001:2015.



# REFERENCES

- EN 15804:2012+A2:2019
- ISO 14040 : 2021
- ISO 14044 : 2021
- Life Cycle Assessment (LCA) of special steel - SBQ bars
- General Programme Instructions, v4.0 (2021-03-29)
- PCR 2019:14 - Construction products - v 1.11 (2021-02-05)

