Environmental Product Declaration

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

Steel rebar manufactured from steel scrap

GERDAU CORSA

Programme:
The International EPD® System,
www.environdec.com

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EPD International AB

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ENVIRONMENTAL PRODUCT DECLARATION

EPD Content

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1. Programme information

EPD® THE INTERNATIONAL EPD® SYSTEM

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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Product Category Rules (PCR)
CEN standard EN 15804:2012+A2:2019/AC:2021 serve as the core Product Category Rules (PCR)
Product category rules (PCR): 2019:14 Construction products. Version 1.3.4 published April 30th, 2024,UN CPC 4124 Bars and rods, hot rolled, of iron or steel.
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)
Elena Dominguez, Mireya González, Dulce Zaragoza (2025), Life Cycle Assessment of Steel Rebar Manufactured from Scrap, Center for Life Cycle Assessment and Sustainable Design – CADIS.

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: Itxaso Trabudua, IK Ingeniería SL.
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 registered in different EPD programmes, 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.

2. Company information

Owner of the EPD:	GERDAU CORSA S.A.P.I. DE C.V
Contact:	Rigoberto Torres Villeda (Market Development Advisor) rigoberto.torres@gerdau.com Tel:5544010036
Description of the organisation:	Gerdau Corsa is a leader in the production of long steel in the Americas and one of the main suppliers of special long steel in the world. It is the largest recycler in Latin America and annually transforms millions of tons of scrap into steel. Gerdau has a technical team focused on understanding and meeting customer needs, providing solutions for every requirement. In addition to delivering high-quality steel products, offer value-added services such as custom-length cuts to optimize the fabrication of steel structures for buildings and industrial applications. Our extensive network of steel mills spans the United States, Argentina, Peru, Uruguay, Brazil, Canada, and Mexico.
Product-related or management system-related certifications:	ISO 9001:2015, 14001:2015 and 45001:2018
Name and location of product site:	**Manufacturing plant:** Primera Sur S/N, Colonia Independencia, Tultitlán, State of Mexico, ZIP Code 54915, Mexico

GERDAU CORSA

Gerdau's history began in 1901 with a factory in Porto Alegre, Brazil. Today, Gerdau products are present in the daily lives of millions of people.

Gerdau arrived in Mexico in March 2007 with the acquisition of the Tultitlan steel plant (Sidertul). In 2008, Gerdau created a commercial alliance with the Aceros Corsa commercial bar plant and in 2012, Gerdau and Aceros Corsa unified the brand in Mexico under the name Gerdau Corsa. In 2015, Gerdau Corsa starts operations at Planta Sahagun, a structural profiles plant located in Ciudad Sahagun, in the state of Hidalgo.

At Gerdau Corsa, we believe in the transformative power of steel, and since the beginning of our history, the main objective has been to transform the lives of the people around us. Steel can turn projects into reality and drive the development of a better society and a better place to live.

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3.Product information

Product name:	Steel rebar manufactured from steel scrap
Product description:	Gerdau Corsa produces steel rebar manufactured from steel scrap, which are mainly used by the construction industry for beam, joists, girders, derricks, prefabricated elements, concrete poles, etc.
UN CPC code:	UN CPC 4124 Barsand rods, hot rolled, of iron or steel.
Geographical scope:	Mexico

Steel rebar

Steel rebar is used in a wide range of construction projects and meets the following specifications and standards:

Steel Rebar	Presentations		
• NMX-B-506-CANACERO • NMX-B-457-CANACERO	Straight Rod Grade 42 Length 12 m. Tied 2 tons Available gauges: 3,4,5,6,8,10 and 12	Grade 42 Bent Rod Length 12 m. Tied 1 ton. Available gauges: 3 and 4	Straight Rod Grade 56 Length 12 m. Tied 2 tons Available gauges: 6,8,10 and 12

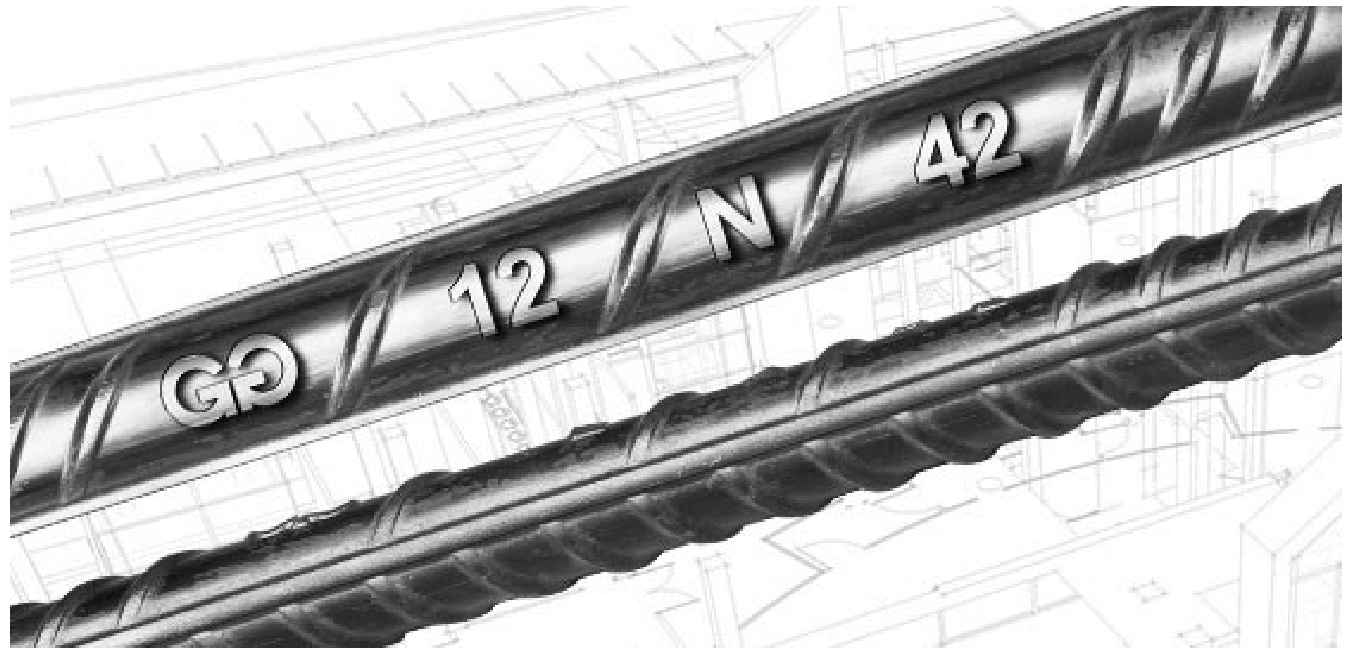

Figure. 1. Steel rebar

Technical information

Designation	Nominal diameter Cross-sectional area		Cross-sectional area	Nominal weight	Size of the madril for doubles	
Number	In	mm	Cm2	Kg/m	Diameter number	mm
3	3/8”	9.5	0.71	0.560	3.5d	33
4	1/2”	12.7	1.27	0.994	3.5d	44
5	5/8”	15.9	1.98	1.552	3.5d	56
6	3/4”	19	2.85	2.235	5d	95
8	1”	25.4	5.07	3.973	5d	127
10	11/4”	31.8	7.94	6.22	7d	223
12	11/2”	38.1	11.4	8.938	8d	305

* The weight and number of pieces may vary +/-6, according to the NMX-B-506-2019.

The information on the tables of technical specifications is required, please consult the official Gerdau Corsa website https://www.gerdaucorsa.com.mx. Where you can download the Manual, you can also contact Facebook / Instagram / and LinkedIn.

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4. LCA information

Environmental potential impacts were calculated in accordance with EN 15804:2012+A2:2019/AC:2021 sustainability of construction works and PCR 2019:14 Construction products Version 1.3.4. This EPD is in accordance with ISO 14025:2006. Environmental potential impacts were calculated through Life Cycle Assessment (LCA) methodology conformity to ISO 14040:2006 and ISO 14044:2006. An external third-party verification process of the EPD was conducted according to General Programme Instructions from the International EPD® System Version 5.0.0. (General Programme Instructions for The International EPD System, 2024). Verification includes a documental review and a validation of both the underlying LCA study and documents describing additional environmental information that justify data provided in the EPD.

4.1. Declared unit

1000 kg of steel rebar manufactured from steel scrap by Gerdau Corsa at the Tultitlan plant in Estado de México.

4.2. Reference service life

No applicable

4.3. System boundary

The potential environmental impacts were calculated through Life Cycle Assessment (LCA) methodology for steel rebar manufactured from steel scrap according to ISO 14040:2006 and ISO 14044:2006.

According to EN 15804:2012+A2:2019/AC:2021 section 5.2 the following type of EPD is “cradle to gate with modules C1-C4 and module D (A1-A3 +C+D). This EPD is based on information upstream processes and core processes, modules A1 to A3, and approximations of scenarios C1, C2, C3, C4, and D based on construction sector statistics in Mexico (see Table 1). Does not include A4-A5 Construction stage and B Usage stage.

Life cycle stage	Information about the modules contained in the stages	EPD			
		Cradle-to-gate with modules C1-C4 and module D	Cradle-to-gate with modules C1-C4, module D and optional modules	From cradle to grave and module D	EPD construction services: Cradle to door with modules A1-A5 and optional modules
A1-A3 products stage	A1) Raw material procurement A2) Transport A3) Manufacture	Mandatory	Mandatory	Mandatory	Mandatory
A4-A5 Construction stage	A4) Transport A5) Construction / installation	-	Optional for goods Required for services	Mandatory	Mandatory
B Usage stage	B1) Use B2) Maintenance B3) Reparation B4) Replacement B5) Remodeling B6) Operational energy use B7) Operational water use	-	Optional	Mandatory	Mandatory
C End of life stage	C1) Deconstruction, demolition C2) Transport C3) Waste processing C4) Final disposition	Mandatory	Mandatory	Mandatory	Optional
D Benefits and charges beyond the system limit	D) Reuse, recycling or energy recovery potential	Mandatory	Mandatory	Mandatory	-

Table 1.System boundary.

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4. LCA information

	Product stage			Construction process phase		Usage stage						End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction facility	Use	Maintenance	Repair	Restoration	Operational energy use	Operational use of water	Demolition/ Deconstruction	Transport	Waste processing	Disposal	Reuse – Recovery – Recycling - potential
Module	A1	A2	A3	A4	A5	B1	B2	B4	B5	B6	B7	C1	C2	C3	C4	D
Declared modules	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	MX USA CA PER CHN IND BR	MX	MX	ND	ND	ND	ND	ND	ND	ND	ND	MX	MX	MX	MX	MX
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-
Product variation	0%			-	-	-	-	-	-	-	-	-	-	-	-	-
Site variation	0%			-	-	-	-	-	-	-	-	-	-	-	-	-

X = Declared module; ND = No declared module; NR = No reported; MX= Mexico, USA= United States of America, CA=Canada, PER=Peru, CHN=China, IND=Indian, BR= Brazil..

Table 2.Description of the modules included in this EPD.

4. LCA information

4.4 Description of information modules

Description of information modules is included in **Table 3**.

A1) Raw materials supply	A2) Transportation	A3) Manufacturing	C) End of life	D) Benefits and charges beyond the system limit
• Consumption and production of raw materials. • Consumption and production of electrical energy. • Consumption and production of natural gas and diesel. • Packaging materials for raw materials.	• Distance of transport of raw materials, auxiliary inputs and packaging to the manufacturing site. • Fuel consumption and emissions related to transport requirements.	• Consumption of auxiliary inputs. • Water consumption and production. • Packaging materials for auxiliary inputs and final product. • Emissions to air and water. • Waste generation. • Transport distance for waste disposal.	• Demolition. • Transport final destination. • What can be recycled. • What goes to fill what is wasted and not recycled.	• Avoided loads and benefits.

Table 3. Description of information modules included in this EPD.

Direct data obtained from Gerdau Corsa records correspond to the technology used in the Steel rebar production process. Data collection was carried out directly from Tultitlan site. The Information is managed in an internal system and specialized software, consumption log, invoices with municipal systems and waste generation logs.

4. LCA information

4.5 Description of the manufacturing process

Product stage (modules A1, A2, A3). This stage includes the acquisition of raw materials, transportation and the manufacturing process. It includes the processing of scrap used as the main raw material, the procurement of other raw materials and their associated packaging. It also includes the generation of electrical energy and the production of fuel for the manufacturing process; also, the transportation of raw materials and auxiliary inputs to the manufacturing centers; in relation to the manufacturing process, it includes the production of auxiliary materials, the consumption of water, waste and emissions generated.

The **manufacturing process of Steel rebar** is shown in Figure 2 and is described below: The process begins with the collection of scrap in different locations in the United States, Canada and Mexico. Part of the scrap is then sent to Gerdau Corsa Tultitlán billet manufacturing plant, which are melted in an electric arc furnace and chemically adjusted. The billets are then shaped and cut. After the billet is ready, one part continues to be Steel rebar, another part is sent to the La Presa plant, and another part may be used to manufacture various products upon request. The billets obtained are heated in a reheating furnace and rolled in a rolling mill. The rolled bars are cut by a shear, and the sections are transferred and unloaded into the cooling table, where the material undergoes a deformation, taking on the shape of the final product, which leaves the mill with high quality physical, mechanical and chemical conditions.

End of life stage (modules C1, C2, C3, C4). These life cycle stages include fuel consumption for the demolition of 1000 kg of steel, transport of waste to recycling and sanitary landfill, processing of deconstruction waste for recycling and disposal of waste in sanitary landfill.

Resource recovery stage (module D). Avoided loads and benefits from stopping the production of virgin ore for steel.

4.6 Assumptions

Assumptions were made for each life cycle module, which are shown in the LCA report. This document presents the assumptions for the end-of-life module.

Life Cycle Module	Assumptions
End of Life	• It is assumed that 98% of steel is recycled in Mexico (ALACERO, 2022). • It is assumed that 2% of waste is disposed of in landfills. • It is assumed that the transport distance of steel waste to the recycling site is 250.71 km. • Fuel consumption and emissions data are assumed for the dismantling and handling of steel.

Figure. 2. Flow diagram of Steel rebar manufactured from steel scrap.

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4. LCA information

4.7 Cut-off criteria

All flows of fuel, energy, materials and supplies necessary to produce the steel rebar manufactured from steel scrap have been considered; materials that could be used in preventive or corrective maintenance of machinery and equipment were disregarded, as well as the use of uniforms and personal protective equipment or other auxiliary materials, leaving out textiles impregnated with oils or plastics and the final disposal of these as hazardous waste.

4.8 Allocation

A physical allocation based on mass was applied to distribute the environmental burdens between the Steel rebar and the co-products and products generated during the manufacturing stage. This choice is based on the high variability of market prices for co-products, which hinders a consistent economic allocation, as well as on the existence of a physical and causal relationship in their joint generation. Mass allocation, in accordance with section 4.3.4.2.2 of ISO 14044, allows for a more accurate representation of the environmental performance of the system under assessment, particularly when the co-products are not the main objective of the process.

In this study, allocation procedures were applied for products because in the year 2023 in which data was collected, the Tultitlán plant manufactured other products in addition to Steel rebar **(Table 4).**

Coproduct	Quantity	Unit	Assignment
Profiles	11,960	Ton	3.39%
Steel rebar	**340,838**	**Ton**	**96.61%**
Total produced in the year	352,798	Ton	100%

Table 4. Product generated the processing of Tultitlan plant.

In the evaluated product system, steel scrap is the raw material used in the production of billets (the raw material for Steel rebar), with post-consumer scrap accounting for over 90% of the total input. This information is based on primary data obtained directly from the operational records of Gerdau Corsa for the reference period.

The life cycle inventory included the materials needed to manufacture the billet and then the Steel rebar according to the declared unit. The allocation of materials corresponding to the billet was 91.91%, while the allocation for the Steel rebar corresponded to 98.58%. The remainder, in each case, corresponded to the generation of co-products (**Table 5 and 6**, respectively).

Coproduct	Quantity	Unit	Assignment
Dust of Steel	18.08	kg	1.64%
Steel slag	71.16	kg	6.45%
Steel billet	**1014.38**	**kg**	**91.91**
Total	1103.62	kg	100.00%

Table 5. Allocation for the manufacturing process of the Billet manufactured in Tultitlan.

Coproduct	Quantity	Unit	Assignment
Steel Shell	4.77	kg	0.47%
Sludge steel shell	9.60	kg	0.95%
Steel rebar	**1000**	**kg**	**98.58%**
Total	1014.38	kg	100.00%

Table 6. Allocation for the manufacturing process of Steel rebar manufactured in Tultitlan.

The allocation of waste follows the Polluter Pays Principle, as established in the PCR. Waste is assigned to the system that generates it until it reaches the end-of-waste state. If this state is not met, all treatment impacts remaind with the generating system.

4.9 Time representativeness

Direct data obtained from Gerdau Corsa is representative for 2023.

4.10. Excluded lifecycle stages.

The modules: A4, A5, B1, B2, B3, B4, B5, B6, B7.

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5. Content declaration

Steel rebar manufactured from steel scrap is produced in electric arc furnaces. The typical composition is in **Table 7.**

Table 7. Content Steel rebar manufactured from steel scrap.

Product components	Weight, kg	Weight, %	Chemical substances	Number CAS	Health class 1	Post-consumer recycled material, weight-% of product	Pre-consumer recycled material, weight-% of product	Biogenic content (kg)	Biogenic content (kg C/product)
Steel scrap*	936.67	93.67	Iron	7439-89-6	Not listed	82%	18%	0.0	0.0
Anthracite	2.37	<1	Anthracite	8029-10-5	Not listed	0.0	0.0	0.0	0.0
Dolomite	25.06	2.5	Calcium carbonate	471-34-1	Not listed	0.0	0.0	0.0	0.0
Hard Coal	18.65	1.87	Coal	7440-44-0	Not listed	0.0	0.0	0.0	0.0
Calcitic lime	10.06	1.01	Calcium carbonate	471-34-1	Not listed	0.0	0.0	0.0	0.0
Ferrosilicon Manganese	7.18	<1	Iron, Manganese and silicon	11114-55-9	Not listed	0.0	0.0	0.0	0.0
ferroalloys	0.012	<1	Iron, vanadium, chromium, niobium	11147-86-7 11114-46-8 11110-73-7	Not listed	0.0	0.0	0.0	0.0

Packaging materials	Weight, kg	Weight-% (versus the product)	Biogenic content (kg)	Biogenic content (kg C/product)
Steel strapping	0.22	<1	0.0	0.0

*Steel manufactured in Gerdau Corsa uses 100% steel scrap as source of iron.
1 According to EN15804 declaration of material content of the product shall List of Substances of Very High Concern (SVHC) that are listed by European Chemicals Agency.
NOTE: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

5.1 Distribution packaging
Steel strapping is used as packaging material.

5.2 Biogenig carbon information
The Steel rebar manufactured from steel scrap doesn't have biogenic carbon content. Biogenic carbon from packaging and products was excluded from the system, since by mass it represents less than 5% and have no biogenic carbon content ("2019:14 Construction products, Version 1.3.4").

[1] European Chemical Agency (ECHA):
a)Candidate List: https://echa.europa.eu/es/candidate-list-table?p_p_id=disslists_WAR_disslistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=3&_disslists_WAR_disslistsportlet_javax.portlet.action=searchDissLists
b)Authorisation list https://echa.europa.eu/es/authorisation-list?p_p_id=disslists_WAR_disslistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=1&p_p_col_count=2&_disslists_WAR_disslistsportlet_javax.portlet.action=searchDissLists
Restriction list https://echa.europa.eu/es/substances-restricted-under-reach?p_p_id=disslists_WAR_disslistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=1&p_p_col_count=2&_disslists_WAR_disslistsportlet_javax.portlet.action=searchDissLists

6. Results of the environmental performance indicators

The Life Cycle Impact Assessment was calculated using the EN 15804+A2 Method V1.02 / EF 3.1 normalization and weighting set (PRé-Sustainability, 2021) and Ecoinvent 3.10, implemented in the SimaPro 9.6.0.1 software.

Infrastructure and capital goods are not included, in accordance with PCR 2019:14 V.1.3.4.

6.1 Potential environmental impact

Electricity impact

The electricity generation data in Mexico comes from the Ecoinvent 3.10 database and information from the National Center for Energy Control (CENACE), which is a decentralized public body whose purpose is to manage the Operational Control of the National Electric System in México. With both references a dataset was created, named "Electricity, high voltage, 2023 {MX}| market for electricity, high voltage | Cut-off, U", this dataset represents the most recent electricity Mexican grid by type of technology.

Type of technology	Total
Deep geothermal	1%
Hard coal	4%
Hydro, run-of-river	6%
Natural gas, combined cycle power plant	59%
Natural gas, conventional power plant	9%
Nuclear, boiling water reactor	3%
Wind, 1-3MW turbine, onshore	5%
Photovoltaic, 570kWp open ground installation, multi-Si	5%
Ethanol production from sweet sorghum	<0%
Oil	2%
Natural gas, burned in gas turbine, for compressor station	6%
TOTAL	**100%**

Table 8. Mexican electricity grid.

As part of the requirements of the PCR, the climate impact as kg CO2 eq/kWh of the electricity used in the manufacturing process of Steel rebar, is reported in Table 9. This impact was calculated using the GWP-GHG indicator evaluated with IPCC GWP100 method.

Electricity	Quantity
Electricity, high voltage, 2023 {MX}| market for electricity, high voltage | Cut-off, U	4.63E-01

Table 9. Electricity Global Warming Potential (kg CO_2 eq/kWh).

Global warming potential (GWP-GHG) of Scrap use

Another specific topic in accordance with the requirements of the PCR is the report of the Global warming potential of the scrap inputs per 1000 kg steel rebar; this impact was calculated using the GWP-GHG indicator and it is reported in **Table 10.**

Impact Basic Category	Unit	Quantity
Global warming potential (GWP-GHG) of scrap use	kg CO_2 eq.	6.69E+01

Table 10. Scrap use, Global warming potential.

All information modules are reported separately. However, the total impact across all stages is also presented. Parameters describing environmental potential impacts were calculated using EN 15804+A2 Adapted version 1 (https://eplca.jrc.ec.europa.eu/permalink/EN_15804.zip) as implemented in SimaPro 9.6.0.1.

6. Results of the environmental performance indicators

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Module A1) Raw materials presents the greatest potential impact, with percentages above 51% in 11 of the 13 basic impact categories evaluated. Module A3) Manufacturing is the second stage with the second highest contribution to the categories, with percentages above 59% in two of the 13 basic impact categories evaluated, corresponding to Abiotic depletion potential - non-fossil resources and Potential water deprivation (user). The lowest potential environmental contributions are generated in module A2) Transportation, six categories showed significant percentages of 2% to 6%, and one of 26%, corresponding to Depletion potential of the stratospheric ozone layer.

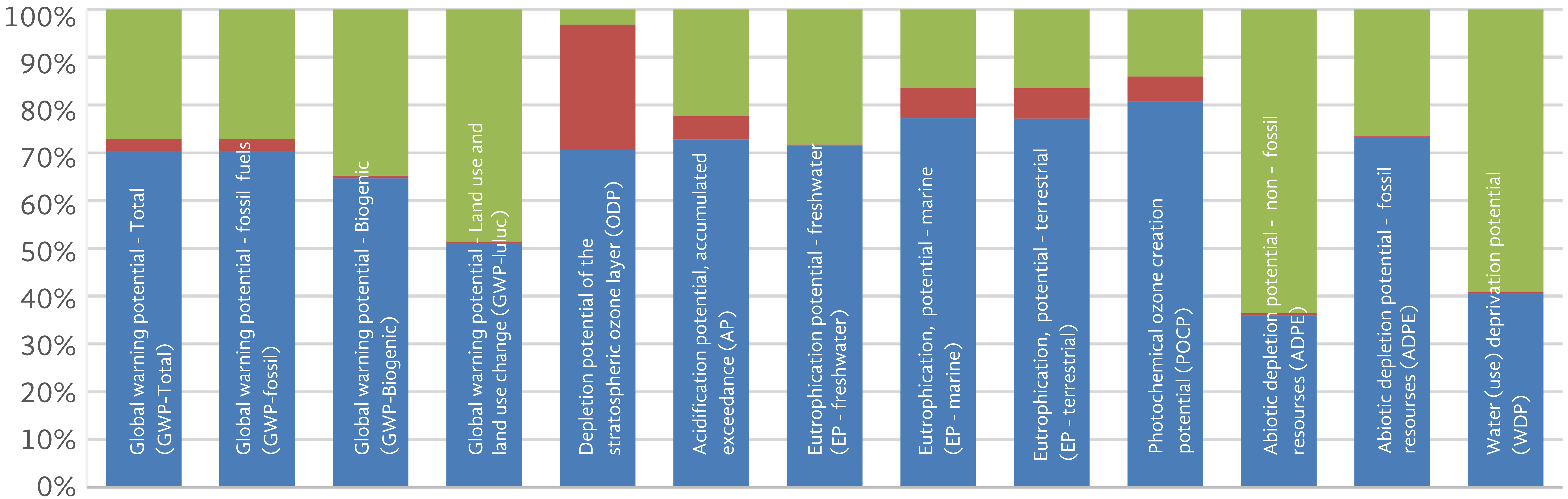

Figure. 3.A1-A3. Basic impact categories results of Steel rebar.

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6. Results of the environmental performance indicators

Basic impact categories	Unit	A1) Raw materials	A2) Transportation	A3) Manufacturing	Total
Global warming potential - total (GWP-total)	kg CO_2 eq.	4.13E+02	1.47E+01	1.59E+02	5.87E+02
Global warming potential - fossil fuels (GWP-fossil)	kg CO_2 eq.	4.13E+02	1.47E+01	1.59E+02	5.87E+02
Global warming potential - biogenic (GWP-biogenic)	kg CO_2 eq.	6.94E-02	5.95E-04	3.72E-02	1.07E-01
Global warming potential - land use and land use change (GWP-luluc)	kg CO_2 eq.	7.20E-02	4.13E-04	6.82E-02	1.41E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC_{11} eq.	1.13E-05	4.19E-06	5.05E-07	1.60E-05
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	1.31E+00	8.81E-02	4.02E-01	1.80E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	7.81E-03	2.54E-05	3.08E-03	1.09E-02
Eutrophication potential - marine (EP-marine)	kg N eq.	3.81E-01	3.18E-02	8.05E-02	4.93E-01
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	4.20E+00	3.49E-01	8.94E-01	5.44E+00
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	1.64E+00	1.07E-01	2.86E-01	2.04E+00
Abiotic depletion potential - non-fossil resources (ADPE)*	kg Sb eq.	4.19E-05	6.27E-07	7.38E-05	1.16E-04
Abiotic depletion potential - fossil resources (ADPF)*	MJ, net calorific value	1.58E+03	3.64E+00	5.70E+02	2.15E+03
Water (user) deprivation potential (WDP)*	m^3 world eq. deprived	3.17E+01	1.39E-01	4.60E+01	7.79E+01

Table 11.A1-A3. Basic impact categories result of steel rebar.

Basic impact categories	Unit	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Global warming potential - total (GWP-total)	kg CO_2 eq.	3.72E-01	1.99E+01	0.00E+00	5.43E-02	-7.90E+01
Global warming potential - fossil fuels (GWP-fossil)	kg CO_2 eq.	3.72E-01	1.99E+01	0.00E+00	5.43E-02	-7.90E+01
Global warming potential - biogenic (GWP-biogenic)	kg CO_2 eq.	1.60E-05	9.35E-04	0.00E+00	4.44E-06	-4.79E-03
Global warming potential - land use and land use change (GWP-luluc)	kg CO_2 eq.	1.28E-05	6.40E-04	0.00E+00	2.22E-06	-8.23E-03
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC_{11} eq.	5.85E-09	2.86E-07	0.00E+00	8.05E-10	-1.73E-07
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	3.48E-03	7.22E-02	0.00E+00	4.93E-04	-2.48E-01
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	3.51E-07	4.76E-05	0.00E+00	1.95E-07	-2.61E-03
Eutrophication potential - marine (EP-marine)	kg N eq.	1.63E-03	2.94E-02	0.00E+00	2.24E-04	-5.02E-02
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	1.79E-02	3.22E-01	0.00E+00	2.46E-03	-5.87E-01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	5.33E-03	1.05E-01	0.00E+00	7.43E-04	-2.02E-01
Abiotic depletion potential - non-fossil resources (ADPE)*	kg Sb eq.	1.55E-08	1.16E-06	0.00E+00	2.15E-09	-1.14E-05
Abiotic depletion potential - fossil resources (ADPF)*	MJ, net calorific value	5.25E-02	6.84E+00	0.00E+00	3.14E-02	-6.32E+02
Water (user) deprivation potential (WDP)*	m^3 world eq. deprived	3.86E-03	2.39E-01	0.00E+00	6.32E-04	-4.82E+00

Table 12.Impact assessment of C1-C4 and D modules.

*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.
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.

Disclaimer discouraging:The use of the results of modules A1-A3 without considering the results of module C.

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.
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.

6. Results of the environmental performance indicators

6.1.1. Global Warming Potential (GWP-GHG)

Table 13 shows the result of Steel rebar life cycle (modules A1-A3 and additional scenarios C1-C4 and D) evaluated with the IPCC GWP100 method.

Impact category	Unit	A1-A3	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Global warming potential (GWP-GHG)1	kg CO_2 eq.	5.87E+02	3.72E-01	1.99E+01	0.00E+00	5.43E-02	-7.13E+01

1This 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 CF for biogenic CO_2 is set to zero.

Table 13.Climate Impact (GWP-GHG) of Steel rebar.

6.2 Use of resources

Parameters describing resource use were evaluated with the Cumulated Energy Demand method version 1.09 (Frischknecht et al. 2007) and adjusted with option B of Annex 3 of the PCR 2019:14 Construction products. Version 1.3.4, except for the indicator of use of net fresh water that was evaluated with Recipe 2016 Midpoint (H) version 1.00 (Huijbregts et al. 2017). A detailed description of the use of resources is provided in **Table 14.**

Indicators describing resource use	Unit	A1-A3	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Use of renewable primary energy as energy carrier (PERE)	MJ, net calorific value	5.42E+02	1.10E-02	4.30E-01	1.89E+02	3.31E-03	-7.45E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	1.94E+02	0.00E+00	0.00E+00	-1.89E+02	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ, net calorific value	7.36E+02	1.10E-02	4.30E-01	0.00E+00	3.31E-03	-7.45E+00
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	1.65E+03	5.48E-02	7.17E+00	5.75E+02	3.30E-02	-6.64E+02
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	5.91E+02	0.00E+00	0.00E+00	-5.75E+02	0.00E+00	0.00E+00
Total use of non renewable primary energy resource (PENRT)	MJ, net calorific value	2.24E+03	5.48E-02	7.17E+00	0.00E+00	3.30E-02	-6.64E+02
Use of secondary material (SM)	kg	8.85E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m^3	2.01E+00	1.53E-04	9.87E-03	0.00E+00	2.41E-05	-1.26E-01

Table 14.Use of resources parameters of 1000 kg of Steel rebar.

6. Results of the environmental performance indicators

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6.3 Waste indicators and output flows

Environmental indicators describing waste generation were calculated using EDIP 2003 method (Hauschild and Potting, 2005). Environmental parameters describing waste generation are provided below:

Impact category	Unit	A1-A3	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Hazardous waste disposed (HWD)**	kg	6.76E-02	3.36E-05	1.82E-03	0.00E+00	4.62E-06	-8.44E-03
Non-hazardous waste disposed (NHWD) **	kg	5.14E+00	1.43E-04	1.11E-02	0.00E+00	2.00E+01	-4.88E-01
Radioactive waste disposed (RWD) ***	kg	7.91E-03	2.50E-07	9.32E-06	0.00E+00	4.27E-08	-1.07E-04
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	3.62E+00	0.00E+00	0.00E+00	9.80E+02	0.00E+00	9.80E+02
Materials 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, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 15.Other indicators describing waste categories and output flowsof Steel rebar.

Environmental information describing waste categories and output flows is calculated using the EDIP 2003 method (Hauschild and Potting, 2005).
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.
*Direct indicators from Gerdau Corsa process data
**Indirect indicators are not related to Gerdau Corsa operations but to the generation during the processes of obtaining auxiliary inputs.
***No radioactive waste is produced during Gerdau Corsa operation.

7. Additional environmental information

The company has the following certifications:

Environment

Gerdau Corsa seeks to balance our economic, environmental, and social commitments. Each day, our team members make steel products almost entirely composed of recycled content. That's one way in which we reduce our environmental footprint.

Recycling

Steel is an endlessly recyclable material. Each year, Gerdau Corsa transforms about 1 million tons of recycled scrap into steel products. Most of the scrap comes from discarded materials.
Producing steel from scrap metal reduces the amount of material deposited in landfills.
The use of steel scrap as a raw material reduces energy consumption in our production process and minimizes emissions of CO_2.

8. Version history

The previous version of this EPD named Steel rebar manufactured from steel scrap was published on July 27, 2020, in accordance with PCR 2012:01 Construction products and construction services, Version 2.3 (2018-11-15).

This EPD was updated following EN 15804:2012+A2:2019/AC:2021 standard and Construction products PCR 2019:2014 V 1.3.4.

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