Environmental Product Declaration

Statement of Verification

CARES EPD No.: 0088

Issue 00

This is to verify that the

Environmental Product Declaration

Provided by:
ArcelorMittal Hamburg GmbH

Is in accordance with the requirements of:
EN ISO 14025:2010 and EN 15804:2012 + A2:2019/AC2021
and CARES PCR for Type III EPD of Semi-Finished and Finished Steel Products, February 2025

This declaration is for: Carbon Steel Wire Rod (Secondary (scrap based) and Direct Reduced Iron and production route)

Company address:

Dradenaustrasse 33
D - 21129
Hamburg
Germany

LadinCamci		
Signed for CARES	Ladin Camci Operator	30 June 2026 Date of this Issue
30 June 2026 First Issue Date		29 June 2029 Expiry Date

The validity of this Environmental Product Declaration can be verified by contacting CARES on +44 (0)1732 450 000 or visiting CARES website https://www.carescertification.com/certification-schemes/environmental-product-declarations.

CARES, Pembroke House, 21 Pembroke Road, Sevenoaks, Kent TN13 1XR

Environmental Product Declaration

EPD Number: CARES EPD 0088

General Information

EPD Programme Operator	CARES Pembroke House, 21 Pembroke Road, Sevenoaks, Kent, TN13 1XR UK www.carescertification.com
Applicable Product Category Rules	CARES Product Category Rules (PCR) for Type III Environmental Product Declaration (EPD) of Semi-Finished and Finished Steel Products, February 2025
Commissioner of LCA study	CARES Pembroke House, 21 Pembroke Road, Sevenoaks, Kent, TN13 1XR UK www.carescertification.com
LCA consultant/Tool	CARES EPD Tool version 3.0 SPHERA SOLUTIONS UK LIMITED The Innovation Centre Warwick Technology Park, Gallows Hill, Warwick, Warwickshire CV34 6UW UK www.sphera.com
Declared/Functional Unit	1 tonne of carbon steel wire rod manufactured by the secondary (scrap-based) and direct reduced iron production route
Applicability/Coverage	Manufacturer-specific product produced at a single plant of one manufacturer
EPD Type	Cradle to Gate with Modules C1-C4 and Module D
Background database	MLC (GaBi) Databases 2025.1 (Sphera, 2025)

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b]) Third party verifier: Dr Jane Anderson
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability

Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019/AC2021. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019/AC2021 for further guidance

Information modules covered

Product Stage			Construction Stage		Use Stage							End-of-life Stage				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓

Note: Checks indicate the Information Modules declared.

Manufacturing site

ArcelorMittal Hamburg GmbH
Dradenaustrasse 33
D - 21129
Hamburg
Germany

Construction Product:

Product Description

This EPD covers carbon steel wire rod in coils manufactured by ArcelorMittal Hamburg GmbH, located in Hamburg, Germany. Wire rod is produced via a scrap-based Electric Arc Furnace (EAF) route, with the metallic charge supplemented by Direct Reduced Iron (DRI) from the integrated on-site facility, purchased DRI and Hot Briquetted Iron (HBI), and purchased pig iron.

Carbon steel wire rod in coil is a non-alloy or low-alloy steel product obtained through electric arc furnace melting followed by high-speed hot rolling and coiling. These products are produced in accordance with the relevant standards listed in the References section. They serve as raw material for further processing into cold-drawn wire, welded wire mesh, or other reinforcement products, and can also be used directly in reinforced concrete to provide essential tensile strength and structural integrity.

Technical Information

Property	Value, Unit
Production route	EAF
Weldability (C_{eq})	As per the requirements of the wire rod product standards listed in References section of this EPD report
Yield strength	
Tensile strength	
Elongation	
Bend and/or Re-bend test	
Recycled content (as per ISO 14021:2016/Amd:2021)	84.0 (Including internal and external scrap) 78.4 (Including external scrap only)

Main Product Contents

Material/Chemical Input	%
Fe	97
C, Mn, Si, V, Ni, Cu, Cr, Mo and others	3

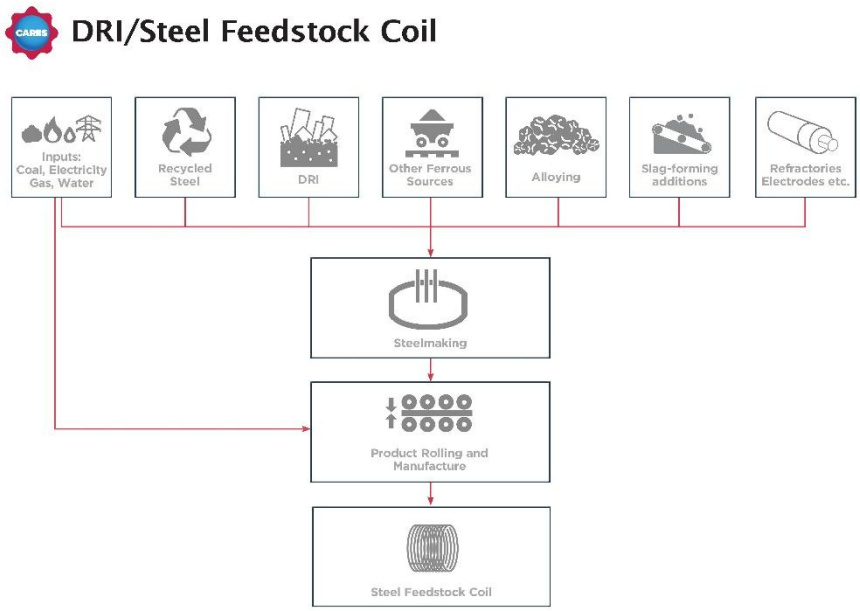
Manufacturing Process

The production of steel wire rod at ArcelorMittal Hamburg follows a scrap-based Electric Arc Furnace (EAF) route with supplementary virgin iron units from the integrated on-site Direct Reduction facility. The process is categorised into the following stages:

- Direct Reduction (DRI): An on-site direct reduction facility reduces high-grade iron ore pellets using a reducing gas derived from natural gas (carbon monoxide and hydrogen) to produce Direct Reduced Iron (DRI) in a solid-state process without melting. Natural gas serves as both the energy source and the reforming feedstock for the reducing gas. This virgin iron source supplements the primary scrap charge to control nitrogen content and improve steel cleanliness. Additional virgin iron units are sourced externally as purchased DRI/HBI and pig iron as required.
- Melting (EAF): The combined metallic charge consisting predominantly of recycled steel scrap together with on-site DRI, purchased DRI/HBI, and pig iron is charged into an Electric Arc Furnace (EAF). High-power electrical energy is used to melt the charge into liquid steel, while fluxing agents are added to form slag and remove impurities.
- Refining (LF): The molten steel undergoes secondary metallurgy in a Ladle Furnace (LF). During this stage, the chemical composition is precisely adjusted through the addition of ferro-alloys, and the steel is homogenised to meet the required grade specifications and mechanical properties.
- Continuous Casting (CCM): The refined liquid steel is cast into semi-finished billets through a Continuous Casting Machine (CCM), where it is cooled and solidified into a uniform cross-section.
- Hot Rolling and Finishing: The billets are reheated in a gas-fired furnace and processed through a series of roughing, intermediate, and finishing rolling stands, ending in a high-speed finishing block. The rolled rod is formed into overlapping rings by a laying head and deposited onto a controlled-cooling conveyor, where the cooling rate is regulated by adjustable forced-air ventilation to achieve the required mechanical properties. The cooled coils are compacted, bound, and labelled for dispatch.

After rolling, the products undergo rigorous quality control, including mechanical and dimensional testing to ensure compliance with relevant product standards. The wire rod coils are secured for transport by binding with steel wires or straps. Both the steel ties and the products do not include any biogenic materials.

Process flow diagram



Construction Installation

Processing and proper use of reinforcing steel and other structural steel products manufactured from carbon steel wire rods depends on the application and should be made in accordance with generally accepted practices, standards and manufacturing recommendations.

During transport and storage of carbon steel wire rods and reinforcing steel and structural steel products manufactured from them the usual requirement for securing loads is to be observed.

Use Information

The composition of the reinforcing steel and other structural steel products manufactured from carbon steel wire rods does not change during use.

Carbon steel reinforcing bars and other structural steel products do not cause adverse health effects under normal conditions of use.

No risks to the environment and living organisms are known to result from the mechanical destruction of the reinforcing steel product itself.

End of Life

Reinforcing steel bars and other structural steel products manufactured from carbon steel wire rods are not reused at end of life but can be recycled to the same (or higher/lower) quality of steel depending upon the metallurgy and processing of the recycling route.

A recycling rate of 92% is adopted for the primary end-of-life scenario in this EPD, with 100% landfill and 100% recycling declared as alternative scenarios per CARES PCR requirements.

Life Cycle Assessment Calculation Rules

This EPD uses the "Cut-off by Classification" method, also known as the recycled content method. It assigns the environmental impacts of primary material production to the initial user. Recyclable materials enter the recycling process without burdens, and secondary materials only bear the impacts of recycling.

This method promotes recycling by making producers responsible for waste management. It supports a circular economy by reducing the environmental impacts of primary material production.

This approach follows ISO 14040 and ISO 14044 standards for Life Cycle Assessments.

The Life Cycle Impact Assessment (LCIA) has been carried out using the characterisation method described in EN 15804+A2. For all indicators the characterisation factors from the Environmental Footprint v3.1 (EF 3.1) was applied.

Declared unit description

1 tonne of carbon steel wire rod manufactured by the secondary (scrap-based) and the direct reduced iron production route.

System boundary

The system boundary of the EPD follows the modular design defined by EN 15804+A2. Type of this EPD is Cradle to Gate with Modules C1-C4 and Module D.

Impacts and aspects related to losses/wastage (i.e. production, transport and waste processing and end-of-life stage of lost waste products and materials) are considered in the modules in which the losses/wastage occur.

Scrap is considered to reach end-of-waste after collection and processing to a defined scrap quality suitable for recycling, consistent with the applied modelling approach.

Data sources, quality and allocation

Data Sources and Quality:

Data selection and data quality evaluation were performed in accordance with BS EN 15941:2024, considering temporal, geographical and technological representativeness and prioritising specific data over generic data where available.

Data Sources:

Foreground manufacturing data for carbon steel wire rod in coils production were provided by ArcelorMittal Hamburg GmbH for the reference period 01/01/2025 – 31/12/2025 and are representative of the manufacturing site stated in this EPD. Foreground data collection was carried out to meet the cut-off rules of EN 15804:2012+A2:2019/ AC:2021. Foreground data were checked for completeness and plausibility, including mass balance verification, and were verified by CARES during the audit conducted in June 2026. The manufacturing technology and key inputs are described in the Manufacturing Process section and the simplified Process Flow Diagram.

Background datasets are consistently sourced from MLC (GaBi) Databases 2025.1 (Sphera, 2025), selecting country/region-specific datasets where available and appropriate.

Electricity has been modelled following the hierarchy of the CARES PCR 2025, following market-based approach, consistent with EN 15941:2024 and ISO 14067. No Guarantee of Origin (GO) or other contractual instrument was presented to the programme operator for the reference period. Accordingly:

Electricity has been modelled following the hierarchy of the CARES PCR 2025 (market-based approach, consistent with EN 15941:2024 and ISO 14067). No Guarantee of Origin (GO) or other contractual instrument was presented to the programme operator for the reference period. Accordingly:

- For electricity consumed in processes under the direct control of the manufacturer (Modules A1–A3, including melting in the electric arc furnace, secondary metallurgy, continuous casting and rolling), the residual electricity grid mix of Germany has been applied, in line with the CARES PCR 2025 and the requirement to avoid double counting; the consumption mix is not used for these processes. The applied emission factor (EN 15804+A2 / EF 3.1, Climate Change – total) of the Germany residual grid mix is 0.879 kg CO_2 eq/kWh (Sphera MLC Databases 2025.1).

- For the declared modules beyond the manufacturing gate, for which no contractual instrument applies (Modules C1–C4 and Module D), the German electricity (consumption) grid mix has been applied. The applied emission factor (EN 15804+A2 / EF 3.1, Climate Change – total) of the Germany grid mix is 0.462 kg CO_2 eq/kWh (Sphera MLC Databases 2025.1).

Data Quality:
Data quality was assessed and reported with respect to geographical, technological and time representativeness and prioritising specific over generic data. Foreground data were site-specific and based on a continuous 12-month period (2025) and were verified during the CARES audit in June 2026. Background data are consistently and exclusively sourced from MLC (GaBi) Databases 2025.1 (Sphera, 2025), ensuring the overall consistency of the study is not adversely affected by the use of datasets from different LCI databases.

The data quality assessment scheme was applied in accordance with EN 15804:2012+A2:2019/AC:2021, Annex E, Table E.1 — Data quality level and criteria of the UN Environment Global Guidance on LCA database development. No poor or very poor data were found during the assessment of relevant data.

Geographical Representativeness	: Good
Technical Representativeness	: Very good
Time Representativeness	: Good

Allocation:

Electric Arc Furnace slag and mill scale are produced as co-products from the steel manufacturing processes. Impacts are allocated between the steel, the slag and the mill scale based on economic value. Mill scale and EAF slag generate revenue of approximately 0.04% and 0.25% of total product revenue respectively, and their combined share is less than 1% of total product revenue. Although this would permit cut-off under EN 15804:2012+A2:2019/AC:2021, economic allocation has nonetheless been applied given that both co-products carry definite market value and are freely traded.

Internal production losses (home scrap) are recycled in a closed loop, offsetting the requirement for external purchased scrap. Specific information on allocation within the background data is given in the MLC (GaBi) Databases 2025.1 (Sphera, 2025).

Cut-off criteria

On the input side all flows entering the system and comprising more than 1% in total mass or contributing more than 1% to primary energy consumption are considered. All inputs used as well as all process-specific waste and process emissions were assessed. For this reason, material streams which were below 1% by mass were captured as well. In this manner the cut-off criteria according to the PCR requirements are fulfilled.

The mass of steel wire or strap used for binding the product coil is less than 1 % of the total mass of the product.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Core environmental impact indicators									
Life Cycle Stage	Impact Category		GWP-total kg CO_2 eq	GWP-fossil kg CO_2 eq	GWP-biogenic kg CO_2 eq	GWP-luluc kg CO_2 eq	ODP kg CFC11 eq	AP mol H^+ eq	EP-freshwater kg P eq
Product stage	Raw material supply	A1	331	330	0.451	0.376	1.30E-09	0.882	2.14E-04
	Transport	A2	32.3	32.2	0.040	0.086	5.06E-12	0.813	2.85E-05
	Manufacturing	A3	966	966	0.659	0.197	3.24E-10	1.12	9.47E-04
	Total (of product stage)	A1-3	1.33E+03	1.33E+03	1.15	0.659	1.63E-09	2.82	1.19E-03
Construction process stage	Transport	A4	ND	ND	ND	ND	ND	ND	ND
	Construction	A5	ND	ND	ND	ND	ND	ND	ND
Use stage	Use	B1	ND	ND	ND	ND	ND	ND	ND
	Maintenance	B2	ND	ND	ND	ND	ND	ND	ND
	Repair	B3	ND	ND	ND	ND	ND	ND	ND
	Replacement	B4	ND	ND	ND	ND	ND	ND	ND
	Refurbishment	B5	ND	ND	ND	ND	ND	ND	ND
	Operational energy use	B6	ND	ND	ND	ND	ND	ND	ND
	Operational water use	B7	ND	ND	ND	ND	ND	ND	ND
%92 Recycling / %8 Landfill Scenario									
End of life	Deconstruction, demolition	C1	2.24	2.24	2.48E-03	8.43E-05	2.35E-13	0.005	4.05E-07
	Transport	C2	48.4	47.8	0.090	0.477	5.75E-12	0.120	1.26E-04
	Waste processing	C3	0	0	0	0	0	0	0
	Disposal	C4	1.23	1.22	3.96E-05	0.005	3.40E-12	0.009	1.82E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	84.6	84.6	-0.020	0.041	4.32E-11	0.20	2.96E-05
100% Landfill Scenario									
End of life	Deconstruction, demolition	C1	2.24	2.24	2.48E-03	8.43E-05	2.35E-13	0.005	4.05E-07
	Transport	C2	2.23	2.20	0.004	0.023	2.67E-13	0.003	6.11E-06
	Waste processing	C3	0	0	0	0	0	0	0
	Disposal	C4	15.3	15.3	4.95E-04	0.063	4.25E-11	0.108	2.27E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	2.09E+03	2.09E+03	-0.489	1.02	1.07E-09	4.810	7.31E-04
100% Recycling Scenario									
End of life	Deconstruction, demolition	C1	2.24	2.24	2.48E-03	8.43E-05	2.35E-13	0.005	4.05E-07
	Transport	C2	52.4	51.8	0.097	0.516	6.22E-12	0.131	1.36E-04
	Waste processing	C3	0	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-90.0	-89.9	0.021	-0.044	-4.59E-11	-0.21	-3.14E-05

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
GWP-biogenic = Global warming potential, biogenic;
GWP-luluc = Global warming potential, land use and land use change;
ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential, accumulated exceedance; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Core environmental impact indicators

Life Cycle Stage	Impact Category		EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived
Product stage	Raw material supply	A1	0.205	2.24	0.602	6.24E-05	3.93E+03	21.8
	Transport	A2	0.193	2.11	0.549	1.17E-06	389	0.098
	Manufacturing	A3	0.390	4.22	1.38	1.43E-05	1.13E+04	-39.3
	Total (of product stage)	A1-3	0.788	8.570	2.53	7.79E-05	1.56E+04	-17.4
Construction process stage	Transport	A4	ND	ND	ND	ND	ND	ND
	Construction	A5	ND	ND	ND	ND	ND	ND
Use stage	Use	B1	ND	ND	ND	ND	ND	ND
	Maintenance	B2	ND	ND	ND	ND	ND	ND
	Repair	B3	ND	ND	ND	ND	ND	ND
	Replacement	B4	ND	ND	ND	ND	ND	ND
	Refurbishment	B5	ND	ND	ND	ND	ND	ND
	Operational energy use	B6	ND	ND	ND	ND	ND	ND
	Operational water use	B7	ND	ND	ND	ND	ND	ND
%92 Recycling / %8 Landfill Scenario								
End of life	Deconstruction, demolition	C1	2.03E-03	0.022	0.006	6.18E-08	28.8	0.006
	Transport	C2	0.054	0.580	0.129	3.15E-06	626	0.191
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0.002	0.025	0.007	7.57E-08	16.0	0.132
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.047	0.504	0.16	8.37E-07	6.41E+02	0.6
100% Landfill Scenario								
End of life	Deconstruction, demolition	C1	2.03E-03	0.022	0.006	6.18E-08	28.8	0.006
	Transport	C2	1.40E-03	0.015	0.003	1.50E-07	28.8	0.009
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0.028	0.308	0.085	9.46E-07	200	1.65
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	1.16	12.5	3.880	2.07E-05	1.59E+04	14.7
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	2.03E-03	0.022	0.006	6.18E-08	28.8	0.006
	Transport	C2	0.058	0.630	0.140	3.41E-06	678	0.207
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-0.050	-0.536	-0.167	-8.90E-07	-682	-0.632

ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption.
The results of the three environmental impact indicators above shall be used with care as the uncertainties on these results are high or as there is limited experienced with these indicators.

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts

Life Cycle Stage	Impact Category		PM	IRP	ETP-fw	HTP-c	HTP-nc	SQP
			disease incidence	kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.19E-05	4.06	547	3.62E-08	1.34E-06	471
	Transport	A2	1.41E-05	0.107	342	5.01E-09	1.56E-07	47.8
	Manufacturing	A3	1.07E-05	11.6	8.81E+03	1.13E-07	9.33E-06	198
	Total (of product stage)	A1-3	3.67E-05	15.8	9.70E+03	1.54E-07	1.08E-05	7.17E+02
Construction process stage	Transport	A4	ND	ND	ND	ND	ND	ND
	Construction	A5	ND	ND	ND	ND	ND	ND
Use stage	Use	B1	ND	ND	ND	ND	ND	ND
	Maintenance	B2	ND	ND	ND	ND	ND	ND
	Repair	B3	ND	ND	ND	ND	ND	ND
	Replacement	B4	ND	ND	ND	ND	ND	ND
	Refurbishment	B5	ND	ND	ND	ND	ND	ND
	Operational energy use	B6	ND	ND	ND	ND	ND	ND
	Operational water use	B7	ND	ND	ND	ND	ND	ND
%92 Recycling / %8 Landfill Scenario								
End of life	Deconstruction, demolition	C1	2.92E-08	4.55E-03	21.1	4.89E-10	5.4E-09	0.084
	Transport	C2	1.45E-06	0.113	792	1.07E-08	5.87E-07	262
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	1.08E-07	0.019	13.8	2.13E-10	7.98E-09	3.96
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	2.87E-06	-1.11	100	1.35E-07	-1.02E-07	-51.9
100% Lanfill Scenario								
End of life	Deconstruction, demolition	C1	2.92E-08	4.55E-03	21.1	4.89E-10	5.40E-09	0.084
	Transport	C2	3.23E-08	0.005	37.4	5.03E-10	2.84E-08	12.8
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	1.35E-06	0.235	173	2.67E-09	9.98E-08	49.5
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	7.09E-05	-27.5	2.47E+03	3.33E-06	-2.53E-06	-1.28E+03
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	2.92E-08	4.55E-03	21.1	4.89E-10	5.40E-09	0.084
	Transport	C2	1.57E-06	0.123	858	1.16E-08	6.36E-07	284
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.05E-06	1.18	-106	-1.43E-07	1.09E-07	55.2

IRP = Potential human exposure efficiency relative to U235; This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

HTP-nc = Potential comparative toxic unit for humans; and
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
SQP = Potential soil quality index.
The results of the four environmental impact indicators above shall be used with care as the uncertainties on these results are high or as there is limited experienced with these indicators.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use

Life Cycle Stage	Impact Category		PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	307	0	307	3.93E+03	0	3.93E+03
	Transport	A2	10.2	0	10.2	389	0	389
	Manufacturing	A3	168	0	168	1.13E+04	0	1.13E+04
	Total (of product stage)	A1-3	4.85E+02	0	4.85E+02	1.56E+04	0	1.56E+04
Construction process stage	Transport	A4	ND	ND	ND	ND	ND	ND
	Construction	A5	ND	ND	ND	ND	ND	ND
Use stage	Use	B1	ND	ND	ND	ND	ND	ND
	Maintenance	B2	ND	ND	ND	ND	ND	ND
	Repair	B3	ND	ND	ND	ND	ND	ND
	Replacement	B4	ND	ND	ND	ND	ND	ND
	Refurbishment	B5	ND	ND	ND	ND	ND	ND
	Operational energy use	B6	ND	ND	ND	ND	ND	ND
	Operational water use	B7	ND	ND	ND	ND	ND	ND
%92 Recycling / %8 Landfill Scenario								
End of life	Deconstruction, demolition	C1	0.144	0	0.144	28.8	0	28.8
	Transport	C2	43.6	0	43.6	626	0	626
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	3.09	0	3.09	16.0	0	16.0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-101	0	-101	641	0	641
100% Landfill Scenario								
End of life	Deconstruction, demolition	C1	0.144	0	0.144	28.8	0	28.8
	Transport	C2	2.12	0	2.12	28.8	0	28.8
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	38.7	0	38.7	200	0	200
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.50E+03	0	-2.50E+03	1.59E+04	0	1.59E+04
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	0.144	0	0.144	28.8	0	28.8
	Transport	C2	47.2	0	47.2	678	0	678
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	107	0	107	-682	0	-682

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use						
Life Cycle Stage	Impact Category		SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	0	0	0	1.02
	Transport	A2	0	0	0	0.006
	Manufacturing	A3	1.01E+03	0	0	2.74
	Total (of product stage)	A1-3	1.01E+03	0	0	3.77
Construction process stage	Transport	A4	ND	ND	ND	ND
	Construction	A5	ND	ND	ND	ND
Use stage	Use	B1	ND	ND	ND	ND
	Maintenance	B2	ND	ND	ND	ND
	Repair	B3	ND	ND	ND	ND
	Replacement	B4	ND	ND	ND	ND
	Refurbishment	B5	ND	ND	ND	ND
	Operational energy use	B6	ND	ND	ND	ND
	Operational water use	B7	ND	ND	ND	ND
%92 Recycling / %8 Landfill Scenario						
End of life	Deconstruction, demolition	C1	0	0	0	2.15E-04
	Transport	C2	0	0	0	0.021
	Waste processing	C3	0	0	0	0
	Disposal	C4	0	0	0	0.004
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	1.03E+03	0	0	0.049
100% Landfill Scenario						
End of life	Deconstruction, demolition	C1	0	0	0	2.15E-04
	Transport	C2	0	0	0	1.02E-03
	Waste processing	C3	0	0	0	0
	Disposal	C4	0	0	0	0.048
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	0	1.22
100% Recycling Scenario						
End of life	Deconstruction, demolition	C1	0	0	0	2.15E-04
	Transport	C2	0	0	0	0.023
	Waste processing	C3	0	0	0	0
	Disposal	C4	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	1.12E+03	0	0	-0.052

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing waste categories					
Life Cycle Stage	Impact Category		HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	5.40E-07	2.83	0.040
	Transport	A2	1.57E-08	0.038	7.28E-04
	Manufacturing	A3	4.23E-07	21.1	0.136
	Total (of product stage)	A1-3	9.79E-07	24.0	0.177
Construction process stage	Transport	A4	ND	ND	ND
	Construction	A5	ND	ND	ND
Use stage	Use	B1	ND	ND	ND
	Maintenance	B2	ND	ND	ND
	Repair	B3	ND	ND	ND
	Replacement	B4	ND	ND	ND
	Refurbishment	B5	ND	ND	ND
	Operational energy use	B6	ND	ND	ND
	Operational water use	B7	ND	ND	ND
%92 Recycling / %8 Landfill Scenario					
End of life	Deconstruction, demolition	C1	1.00E-09	0.006	3.35E-05
	Transport	C2	2.26E-08	0.081	8.18E-04
	Waste processing	C3	0	0	0
	Disposal	C4	3.51E-09	80.1	1.70E-04
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.40E-07	1.30	-0.011
100% Landfill Scenario					
End of life	Deconstruction, demolition	C1	1.00E-09	0.006	3.35E-05
	Transport	C2	1.04E-09	0.004	3.80E-05
	Waste processing	C3	0	0	0
	Disposal	C4	4.38E-08	1.00E+03	0.002
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.94E-06	32.2	-0.263
100% Recycling Scenario					
End of life	Deconstruction, demolition	C1	1.00E-09	0.006	3.35E-05
	Transport	C2	2.45E-08	0.087	8.86E-04
	Waste processing	C3	0	0	0
	Disposal	C4	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	2.55E-07	-1.38	0.011

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing output flows – at end of life								
Life Cycle Stage	Impact Category		CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0	0	0	0	0	0
	Transport	A2	0	0	0	0	0	0
	Manufacturing	A3	0	0	0	0	0	0
	Total (of product stage)	A1-3	0	0	0	0	0	0
Construction process stage	Transport	A4	ND	ND	ND	ND	ND	ND
	Construction	A5	ND	ND	ND	ND	ND	ND
Use stage	Use	B1	ND	ND	ND	ND	ND	ND
	Maintenance	B2	ND	ND	ND	ND	ND	ND
	Repair	B3	ND	ND	ND	ND	ND	ND
	Replacement	B4	ND	ND	ND	ND	ND	ND
	Refurbishment	B5	ND	ND	ND	ND	ND	ND
	Operational energy use	B6	ND	ND	ND	ND	ND	ND
	Operational water use	B7	ND	ND	ND	ND	ND	ND
%92 Recycling / %8 Landfill Scenario								
End of life	Deconstruction, demolition	C1	0	920	0	0	0	0
	Transport	C2	0	0	0	0	0	0
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	0	0	0	0
100% Landfill Scenario								
End of life	Deconstruction, demolition	C1	0	0	0	0	0	0
	Transport	C2	0	0	0	0	0	0
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	0	0	0	0
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	0	1.00E+03	0	0	0	0
	Transport	C2	0	0	0	0	0	0
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	0	0	0	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	0	0	0	0

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	**Parameter**	**Units**	**Results**
Modules C1 to C4 End of life	The end-of-life stage starts when the construction product is replaced, dismantled or deconstructed from the building or construction works and does not provide any further function. The recovered steel is transported for recycling while a small portion is assumed to be unrecoverable and remains in the rubble which is sent to landfill. 92% of the constructional steel is assumed to be recycled and 8% is sent to landfill [STEELCONSTRUCTION.INFO 2012]. The EPD covers transport to, and end-of-life in Germany. Once steel scrap is generated through the deconstruction activities on the demolition site it is considered to have reached the "end of waste" state. No further processing is required so there are no impacts associated with this module. Hence no impacts are reported in module C3.		
	Waste for recycling - Recovered steel from crushed concrete	%	92
	Waste for energy recovery - Energy recovery is not considered for this study as most end-of-life steel scrap is recycled, while the remainder is landfilled	-	-
	Waste for final disposal - Unrecoverable steel lost in crushed concrete and sent to landfill	%	2
	Portion of energy assigned to rebar from energy required to demolish building, per tonne	MJ	24
	Transport to waste processing by Truck - Fuel consumption	litre/km	1.56
	Transport to waste processing by Truck – Distance	km	463
	Transport to waste processing by Truck – Capacity utilisation	%	85
	Transport to waste processing by Truck – Density of Product	kg/m^3	7850
	Transport to waste processing by Container ship - Fuel consumption	litre/km	0.0041
	Transport to waste processing by Container ship - Distance	km	158
	Transport to waste processing by Container ship – Capacity utilisation	%	50
	Transport to waste processing by Container ship – Density of Product	kg/m^3	7850
Module D	It is assumed that 92% of the steel used in the structure is recovered for recycling, while the remainder is landfilled. "Benefits and loads beyond the system boundary" (module D) accounts for the environmental benefits and loads resulting from net steel scrap that is used as raw material in the EAF and that is collected for recycling at end of life. The balance between total scrap arisings recycled from fabrication, installation and end of life and scrap consumed by the manufacturing process (internally sourced scrap is not included in this calculation). These benefits and loads are calculated by including the burdens of recycling and the benefit of avoided primary production. This study concerns a predominantly scrap-based EAF production route, with supplementary virgin iron units from the integrated on-site DRI facility and purchased DRI/HBI. In a scrap-only secondary production route, more scrap is required as input to the system than is recovered at end of life. In a DRI-only route, a larger net scrap credit arises as the DRI is from virgin sources and there is a high end-of-life recycling rate for steel wire rod products. For this predominantly scrap-based hybrid route, the high secondary material consumption means that, under the worldsteel 'value of scrap' approach, the EoL scrap credit at the default 92% recycling rate does not fully offset the Module D burden attributed to scrap consumed in production. As a result, Module D yields a net burden. The resulting scrap credit/burden is calculated based on the global "value of scrap" approach (/worldsteel 2011).		
	Recycled Content	kg	784
	Re-used Content	kg	0
	Recovered for recycling	kg	920
	Recovered for re-use	kg	0
	Recovered for energy	kg	0

Summary, comments and additional information

Interpretation

Scrap and DRI based wire rod steel product of ArcelorMittal Hamburg GmbH is made via the Electric Arc Furnace production route. The bulk of the environmental impacts and primary energy demand is attributed to the manufacturing phase, covered by information modules A1-A3 of EN 15804:2012+A2:2019/AC2021.

The interpretation of the results has been carried out considering the methodology- and data-related assumptions and limitations declared in the EPD. This interpretation section focuses on the environmental impact categories as well as the primary energy demand indicators only.

Production Stage Contribution Analysis

Scope & indicator:

This analysis explains the production stage A1–A3 using Climate change – total (GWP-total) for the declared unit. It is an interpretive view of hotspots; the module-level tables in LCA Results remain the authoritative values.

Method: EN 15804+A2; CFs: EN 15804 reference package EF 3.1.

Results and reconciliation:

Values represent A1–A3 only. The sum of step contributions equals the A1–A3 Climate change – total reported in the LCA Results tables. Process steps are analytical groupings within A1–A3 and are provided for interpretation; the module-level values remain the authoritative results in the EPD.

Manufacturing Process Step	GWP-total kg CO2 eq	Share of A1–A3 %
DRI Making	198	14.9
Steelmaking	883	66.4
Rolling	248	18.7
Total (A1-A3)	**1.33E+03**	**100.0**

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CARES SCS Sustainable Constructional Steel Scheme v9 – Operational assessment schedule - https://www.carescertification.com/certified-companies/search - Certificate number of conformance to SCS v9 at the time of LCA study – 1319.

CARES SRC Steel for the Reinforcement of Concrete Scheme. Appendix 5 – Quality and operations assessment schedule for the production of billets and wire rod for further processing into carbon steel bar, coil or rod for the reinforcement of concrete, including inspection and testing requirements - https://www.carescertification.com/certified-companies/search - Certificate number of conformance for Plain round coil feedstock for BS 4449:2005 and BS 4482:2005; Ribbed coil feedstock for the production of BS 4449:2005 at the time of LCA study – 910902

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