ENVIRONMENTAL PRODUCT DECLARATION

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

Steel Profiles

from

KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş.

EPD of multiple products, based on the average results of the product group

Programme: International EPD System, www.environdec.com
Programme Operator: EPD International AB
Licensee: EPD Türkiye
Type of EPD: EPD of multiple products from a company
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KARDEMİR

EPD INTERNATIONAL EPD SYSTEM

EPD TÜRKİYE INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

General Information

The International EPD System: EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden, www.environdec.com, support@environdec.com

Licensee: EPD Türkiye, Nef 09 B Blok No:7/15 34415 Kağıthane / İstanbul / Türkiye, www.epdturkey.org, info@epdturkey.org

CEN standard EN 15804 serves as the core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 Construction products (EN 15804+A2) (2.0.1)
UN CPC code: 4219 - Other structures (except prefabricated buildings) and parts of structures, of iron, steel or aluminium; plates, rods, angles, shapes, sections, profiles, tubes and the like, prepared for use in structures, of iron, steel or aluminium; props and similar equipment for scaffolding, shuttering or pitpropping.

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members.
Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support.

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

[X] EPD verification through an individual EPD verification

Third party verifier: Dr. Rajesh Kumar Singh
Approved by: International EPD® System

The procedure for follow-up of data during EPD validity involves third party verifier:
Yes No [X]

KARDEMİR has the sole ownership, liability, and responsibility for this EPD.

LCA accountability: Yıldıray Yılmaz, Metsims Sustainability Consulting, info@metsims.com

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included lifecycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

How to Read This EPD?

An Environmental Product Declaration (EPD) is an ISO Type III Environmental Declaration based on ISO 14025 standard. An EPD transparently reports the environmental performance of products or services from a lifecycle perspective. The preparation of an EPD includes different stages, from acquiring raw materials to the end of life of the final product/service. EPDs are based on international standards and consider the entire value chain. Additionally, EPD is a third-party verified document. This EPD includes the following sections described below.

1. General and Program Information

The first part of an EPD has information about the name of the manufacturer and product/service and other general information such as the validity and expiration dates of the document, the name of the program operator, geographical scope, etc. The second page states the standards followed and gives information about the program operator, third-party verifier, etc. The followed Product Category Rule (PCR) is indicated on the second page.

2. Company and Product/Service Information

Information about the company and the product investigated is given in this section. It summarizes the characteristics of the product provided by the manufacturer. It also includes information about the product such as product composition and packaging.

3. LCA Information

Life Cycle Analysis (LCA) information is one of the most important parts of the EPD as it describes the functional/declared unit, time representativeness of the study, database(s) and LCA software, along with system boundaries. The table presented in this part has columns for each stage in the life cycle. The stages considered are marked 'X' whereas the ones that are not considered are labeled as 'ND' (Not Declared). Not all EPDs consider the full life cycle assessment for a product's entire life stages. The 'System Boundary' page is also the place where one can find detailed information about the stages and the assumptions made.

4. LCA Results

The results of the LCA analysis are presented in table format. The first column in each table indicates the name of the impact category and their measurement units are presented in the second column. These tables show an amount at each life cycle stage to see the impact of different indicators on different stages. Each impact can be understood as what is released through the production of the declared unit of the material. The benefits of reuse/recycling of the declared product are reflected in this section.

The first impact in the table is global warming potential (GWP), which shows how much CO_2 is released at each stage. Other impacts include eutrophication potential, acidification potential, ozone layer depletion, land use related impacts, etc. The second table provides results for resource use and the third table is about the waste produced during production. The fourth and final table shows the results for the GWP-GHG indicator, which is almost equivalent to the GWP-Total indicator mentioned previously. The only difference is that this indicator excludes the biogenic carbon content by following a certain methodology.

About EPD Owner

EPD Owner: KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş.
Contact e-mail: musteriteknikhizmetler@kardemir.com
Production Plant: Fabrika Sahası 78170 Merkez / Karabük / Türkiye
Headquarter: Küçükbakkalköy Mh. Vedat Günyol Cad. Liberty Plaza No: 20/6 Ataşehir / İstanbul / Türkiye

Established in 1937, the Karabük Demir Çelik Fabrikaları ('Karabük Iron and Steel Works') were privatized in 1995 and renamed Kardemir. It is Turkey's first integrated iron and steel plant.

Kardemir produces railway wheels, rail tracks, profiles, coils, rebar construction steel, blooms, platinas, billets, angles, mine poles, pig irons, coke and coke by-products in international quality standards and provides the basic inputs in rail systems, automotive, defense industry, machinery manufacturing, construction and the mining sectors. Since its establishment, Kardemir has realized the project, manufacturing and assembly of numerous industrial plants and is known as the "The Plant that Builds Plants" in Turkey.

All shares of Kardemir are traded on BIST and is among the top 50 Industrial Enterprises in Turkey.

After the privatization, Kardemir rapidly renewed its facilities in line with the requirements of the age, and changed its production process with its renewed steel mill, and increased its capacity, efficiency and profitability with modern technology. In the years 2000s and later on, with the commissioning of the Rail and Profile Rolling Mill, the Rod Wire Mill and the Railroad Wheel Mill, Kardemir expanded its product range and with railroad tracks and wheels, up to 550 mm width heavy profiles and up to 56 mm in diameter coil production capability, Kardemir has become the only company in Turkey and among regional countries in terms of product variety. Continuing growth with its new investments, Kardemir will be achieving 3.5 mn tons/year production capacity next year.

Focusing on Turkey's national targets in the automotive sector, the defense industry and rail systems with the products offered to the market, Kardemir has introduced many new quality steel products with R&D activities it has undertaken and offered them to the service of these sectors.

Kardemir is one of Turkey's leading industrial enterprises with a wide network of operations through its subsidiaries and affiliated companies in various sectors. Kardemir has four major subsidiaries: KARDÖKMAK Inc., which is a leader in its sector with high casting and mechanical processing capacity; KARÇEL Inc., which manufactures all types and grades of steel structures; KARDEMİR ENERGY Inc., which operates a hydroelectric power plant; and KARLİMTAŞ Inc., which handles logistics operations. Additionally, Kardemir has partnerships in other companies, including KARÇİMSA Inc. in the cement sector, ERDEMİR MINING Inc. in the mining sector, VADEMSAŞ Inc., which produces conventional and high-speed railway switches, and EPİAŞ (Energy Markets Operation Inc.) in the energy markets sector. Through these companies, Kardemir operates in steel production, energy, logistics, cement, mining, and railway sectors, maintaining a strong position both nationally and internationally.

Employing approximately 4,500 employees together with its affiliates, Kardemir continues its production as one of the leading companies in the sector with its deep-rooted industrial culture, competent human resources and corporate management experience.

Product Information

Product name: Steel Profiles

Product Identification: The product includes hot-rolled steel rails and heavy structural profiles such as IPE, NPI, NPU, HEA, HEB, angles, mine poles, and platina, manufactured in various sizes with high dimensional precision. Rails are available in standard and hardened types, including corrugated variants.

Product Description: KARDEMİR is the only manufacturer of rail and heavy profile in Turkey and regional countries. Our Rail-Profile Rolling Mill which has the capacity of 450,000 tons / year, has been commissioned for this purpose in 2007. At our facility equipped with advanced technology, operators with at least level 2 user certificates are employed. In addition to the 12-75 m (46-60 kg /m) rails in international standards, R350 HT hardened rails and 59R1, 59R2, 60R1 and 60R2 corrugated rails are produced at the facility. Our company, which also has the HPQ certificate owned by only few rail manufacturers in Europe, has a modern test center consists of test units for laser where geometrical controls are performed in Ray-Profile Rolling Mill, eddy currents where surface controls are made, and ultrasonic test units for internal controls. In this facility, where the shape and size controls are made with the online laser system, we are working the production with an accuracy of one percent of the millimeter. Our company is the only producer of our country in heavy profile production. Our company, where profile production in IPE, NPI, NPU, HEA and HEB types, equal and unequal angles and mine poles are produced, manufactures up to 500 mm NPI type profiles, 400 mm NPU type profiles, 500 mm HEA and HEB type profiles, and 600 mm IPE type profiles.

Technical Specifications

Parameter	Value	Unit
Carbon	≤ 0.24	%
Manganese	≤ 1.60	%
Silicon	0.55	%
Sulfur	≤ 0.035	%
Phosphorus	≤ 0.035	%
Copper	0.55	%
Nitrogen	0.012	%
Tensile Strength	360-510	MPa
Yield Strength	≤ 355 min	MPa
Elongation	≤ 26 min	%
Impact Toughness	27 jolue min	joule min

Content Declaration

Content Declaration

Content Name	Weight, kg	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material[1], kg C/declared unit
Steel Profile*	1.00	11.2	0	0
Total	**1.00**	**11.2**	**0**	**0**

Note 1 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

*Steel profiles are made through steel billets.

Packaging Materials

Material Name	Weight, kg	Weight-% (versus the product)	Biogenic material[1], kg C/declared unit
Corrugated board	0.0012	0.12	0
Plastic strapping	0.0003	0.03	0
Total	**0.0015**	**0.15**	**0**

Note 1 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

Allocation

Allocation has been applied where relevant in accordance with EN 15804 and ISO 14044. In the coke oven process, environmental impacts were allocated based on energy content among coke, coke oven gas and related co-products. In the blast furnace (BF) process, economic allocation was applied to distribute impacts between hot metal, granulated blast furnace slag and blast furnace gas. In the basic oxygen furnace (BOF) process, allocation was carried out based on energy content. Internal production scrap is considered a closed-loop flow and fully recycled within the system without allocation, while externally purchased scrap is modelled as an input material according to its respective background data.

LCA Information

EPD based on declared or functional unit	Declared unit
Declared unit	1 kg of steel profile
Data sources used for this EPD	ecoinvent 3.11 database
LCA Software	SimaPro 10
Version of the EN 15804 reference package	EF reference package 3.1
Scrap (recycled material) inputs contribution level	Less than 10% of the GWP-GHG results in modules A1-A3 come from scrap inputs.
Infrastructure and capital goods	Excluded

Data quality assessment

Description of data quality assessment and reference years	The share of primary data is calculated in conformity with the requirements of the applicable PCR.

Process Name	Source Type	Source	Reference Year	Data category	Share of primary data of GWP-GHG results for A1-A3
Billet Production	Collected	EPD Owner	2024	Primary	79.6%
Others (rolling etc.)	Collected	EPD Owner	2024	Primary	10.5%
Total share of primary data, of GWP-GHG results for A1-A3					90.1%

Note	The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Electricity used in the manufacturing process in A3

Type of electricity mix	On-site generation		Residual electricity mix	
Energy sources	Coke gas:	27.4%	Imported coal	40.5%
	Blast Furnace gas:	39.1%	Natural gas	35%
	Converter gas:	9.7%	Lignite	22.1%
	Energy coal	23.8%	Hard coal	2.39%
	Climate impact (GWP-GHG):	1.80 kg CO_2 eq./kWh	Climate impact (GWP-GHG):	0.91 kg CO_2 eq./kWh
	Average Climate impact (GWP-GHG): 1.45 kg CO_2 eq./kWh			
Method used to calculate residual electricity mix	The market consumption data is modified to exclude all the renewable sources as there is no 'secondary data' on the residual market mix in Türkiye.			

Approximately 60% of the electricity used on site is generated internally through Kardemir's on-site coal and gas fired power plant (CPP). The remaining 40% is sourced from the national electricity grid. The internal generation ensures partial energy independence and contributes to the stability of supply for energy-intensive steel production processes.

System Boundary

Description of the System boundary	b) Cradle to gate with options, modules C1-C4, module D and with optional modules (A1-A3 + C + D and additional module, A4)
Excluded modules	B modules are excluded due to being not relevant with the product. A5 module is also excluded.

	Product stage			Construction process stage		Use stage							End of life stage				Beyond product life cycle
	Raw Material Supply	Transport	Manufacturing	Transport to site	Construction Installation	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
Modules Declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	-	-	-	-	-	-	-	-	GLO				
Share of specific data	90.1%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	<1%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

(ND = Not declared, X = Module included), TR = Türkiye

A1- Raw Material Supply

The A1 stage includes the extraction, processing, and production of raw materials used in the manufacturing of steel profiles. The primary input is steel billets which is produced on-site at KARDEMİR's integrated steel plant through the blast furnace-basic oxygen furnace (BF-BOF) route. The upstream emissions associated with raw material extraction, such as coke, iron ore, limestone, and coal, are considered. The impacts from auxiliary materials and alloying elements used during steelmaking are also included. The inventory data is based on site-specific production figures and secondary data sources from environmental databases for upstream processes.

A2 - Transport

The A2 stage covers the transportation of raw and auxiliary materials from suppliers to KARDEMİR's production site in Karabük, Türkiye. Transportation modes primarily include rail and road, depending on the source location of materials such as iron ore, coke, and fluxes. Specific transport distances and load capacities are taken into account. Emissions associated with fuel consumption and vehicle operation are modelled using appropriate transport datasets.

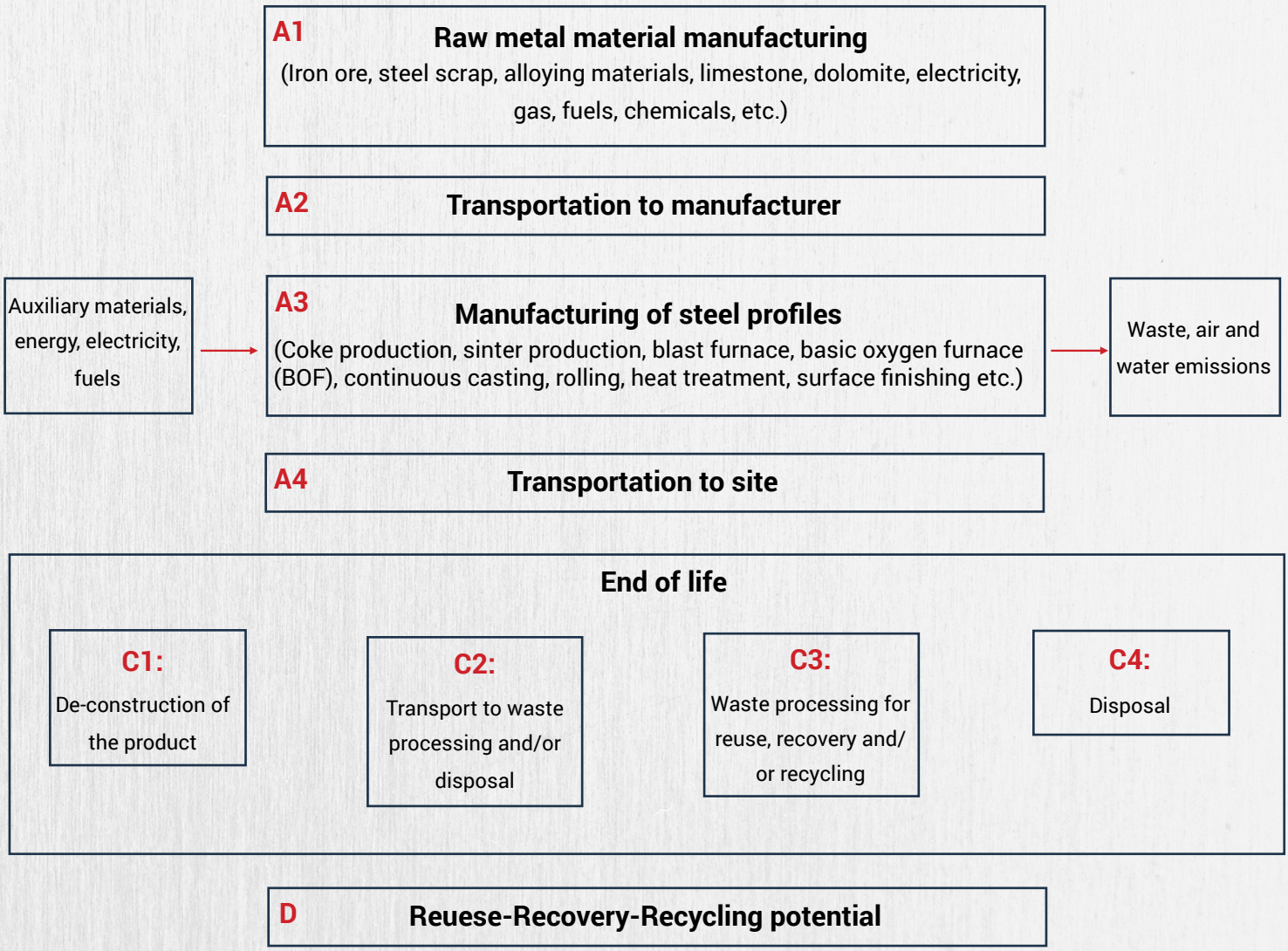
Road	Rail
Vehicle: Lorry Size Class: 16-32 metric ton Emission Standard: EURO5 Fuel Type: Diesel Capacity utilisation: 50 %	Vehicle: Train Fuel Type: Diesel & Electric Mass: 1000 Gt Capacity utilisation: 50 %

System Boundary

A3 - Manufacturing

This stage encompasses the entire steel profile manufacturing process at KARDEMİR's facility, including crude steel production, secondary metallurgy, continuous casting, and rolling. The process is powered by various energy sources including electricity, blast furnace gas, and natural gas. This stage includes in-house material handling, reheating, hot rolling, finishing operations, quality control, and packaging. All emissions and resource consumption (e.g. electricity, water, fuel) occurring within the factory boundary are accounted for based on site-specific operational data. The manufacturing stage includes the following processes as shown in the diagram on the next page.

Process Flow Diagram



System Boundary

A4 - Transport

The A4 stage considers the transportation of the finished steel profiles from the production facility to the construction or installation site. Transport distances are specific and supplied by the manufacturer. Emissions are calculated using appropriate vehicle type, load capacity, and fuel type data.

C1 - De-construction demolition

The C1 stage covers the mechanical dismantling of steel profiles at the end of their service life, including the use of equipment such as cutters and lifting machinery. Emissions resulting from fuel consumption and equipment operation are considered negligible. However, due to the absence of primary data, assumptions provided in the applicable PCR have been adopted. Accordingly, a diesel consumption of 1.1 kWh per tonne of product is assumed.

C2 - Transport

The C2 stage accounts for the transportation of dismantled steel profiles from the demolition site to the waste treatment or recycling facility. In the absence of primary data, the assumptions provided in the applicable PCR have been followed. It is assumed that a Euro 5 lorry with a capacity of 16–32 tonnes operate at a 50% load factor over a distance of 80 km. Emissions associated with this transport scenario are modelled accordingly.

C3 - Waste Processing

The C3 stage represents the waste processing of dismantled steel profiles prior to recycling. This includes operations such as loading and unloading at the sorting facility, mechanical sorting, and steel fragmentation (shredding). In the absence of primary data, the assumptions outlined in the applicable PCR have been applied. Accordingly, diesel consumption is assumed to be 1.8 kWh per tonne for loading/unloading activities and 7.4 kWh per tonne for steel fragging. Additionally, mechanical sorting is assumed to consume 2.2 kWh of electricity per tonne. Emissions from these processes are modelled based on these assumptions.

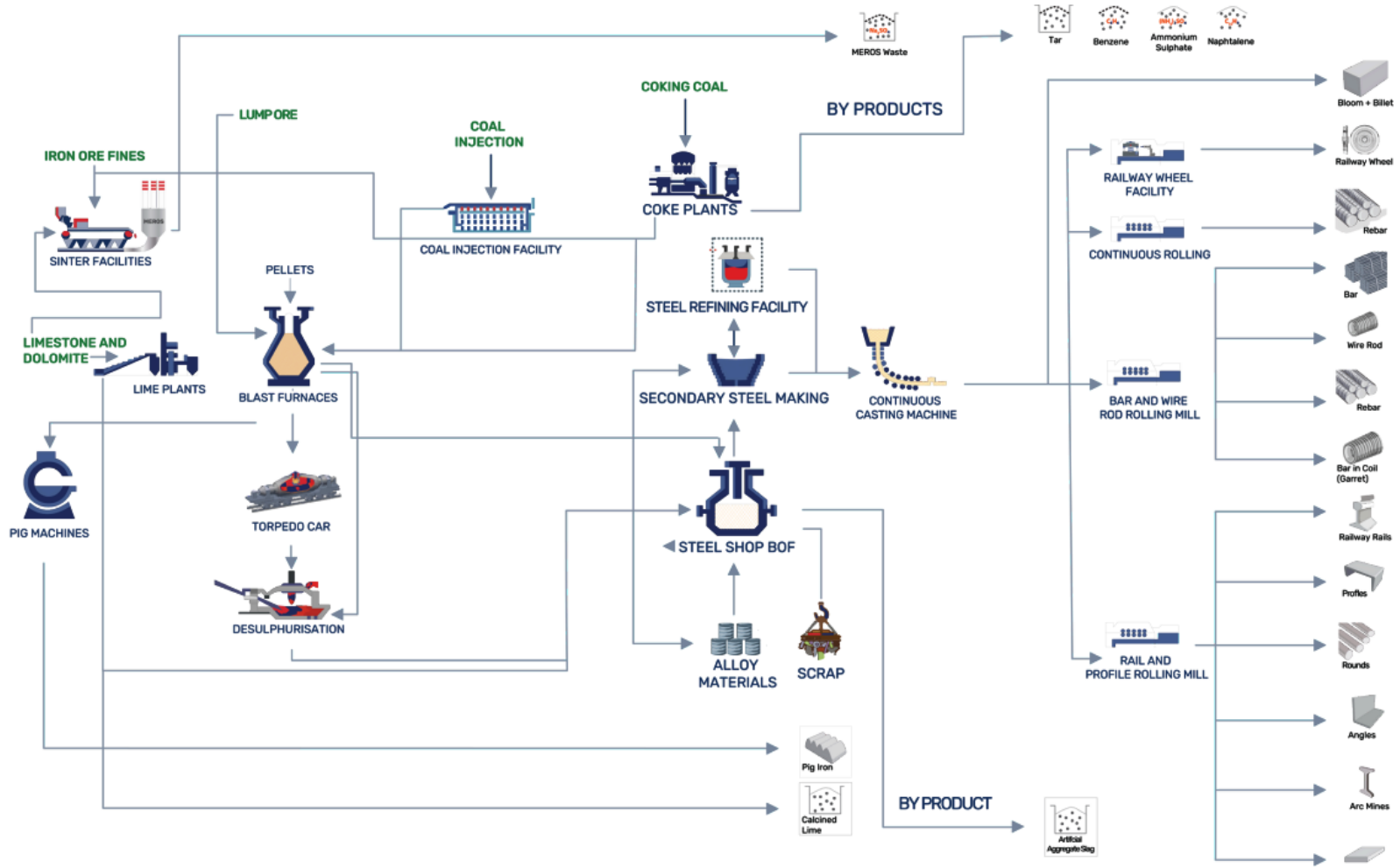
C4 - Disposal

The C4 stage addresses the final disposal of the portion of steel profiles that are not recycled. As steel is predominantly recycled at end-of-life, only 5% of the total product mass is assumed to be sent to landfill. This fraction undergoes compacting as inert construction waste for landfilling or backfilling purposes. In the absence of primary data, the applicable PCR assumption has been applied, with diesel consumption estimated at 1.6 kWh per tonne of waste. Emissions are modelled accordingly for this minor share of the product.

D - Reuse,recovery, recycling potential

Module D accounts for the benefits associated with the end-of-life recycling of the steel profiles. Given that the product consists of 100% BOF steel, and 95% of the material is assumed to be recovered and recycled at end-of-life, the avoided burden approach is applied. The recycled steel is expected to substitute an equivalent amount of primary steel produced via the BOF route in future applications. Therefore, the environmental benefit is modelled as the avoided production of primary pig iron and associated inputs (e.g., iron ore, coke, and limestone), which would otherwise be required for conventional BOF steelmaking. These avoided impacts are reported as net savings under Module D.

Production Flow Diagram



Environmental Performance

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.

Mandatory environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO_2 eq.	2.29E+00	4.62E-02	3.75E-04	2.45E-02	3.83E-03	9.52E-04	-1.02E+00
Climate change - fossil	GWP-fossil	kg CO_2 eq.	2.29E+00	4.62E-02	3.75E-04	2.45E-02	3.83E-03	9.52E-04	-1.02E+00
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	9.03E-04	1.60E-06	1.88E-08	8.51E-07	1.77E-06	4.46E-08	4.10E-04
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	1.02E-03	7.29E-07	1.54E-08	3.88E-07	2.23E-06	4.24E-08	3.24E-04
Ozone depletion	ODP	kg CFC-11 eq.	6.05E-09	1.05E-09	5.70E-12	5.57E-10	5.82E-11	1.43E-11	-1.08E-09
Acidification	AP	mol H+ eq.	8.69E-03	1.19E-04	3.46E-06	6.33E-05	3.23E-05	8.73E-06	-3.24E-03
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	9.51E-04	2.37E-07	3.13E-09	1.26E-07	6.73E-07	1.69E-08	-3.39E-04
Eutrophication aquatic marine	EP- marine	kg N eq.	2.05E-03	4.55E-05	1.63E-06	2.42E-05	1.42E-05	4.06E-06	-8.01E-04
Eutrophication terrestial	EP-terrestrial	mol N eq.	2.19E-02	4.97E-04	1.79E-05	2.64E-04	1.55E-04	4.45E-05	-8.78E-03
Photochemical ozone formation	POCP	kg NMVOC eq.	7.05E-03	1.97E-04	5.34E-06	1.05E-04	4.62E-05	1.33E-05	-3.15E-03
Depletion of abiotic resources-minerals and metals	ADP - minerals & metals[1]	kg Sb eq.	1.00E-06	1.20E-09	1.31E-11	6.39E-10	1.56E-10	3.52E-11	1.23E-07
Depletion of abiotic resources-fossil fuels	ADP-fossil[1]	MJ, net calorific value	2.10E+01	6.13E-01	4.90E-03	3.26E-01	5.75E-02	1.24E-02	-8.94E+00
Water use	WDP[1]	m^3 world eq. deprived	8.36E-01	4.87E-04	6.17E-06	2.59E-04	4.24E-04	1.64E-05	1.68E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; 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; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.								
Disclaimer 1	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.								

Additional mandatory environmental performance indicators

Impact category	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Climate change - GWP-GHG	GWP-GHG[1]	kg CO2 eq.	2.29E+00	4.62E-02	3.75E-04	2.45E-02	3.83E-03	9.52E-04	-1.02E+00
Acronyms	GWP-GHG = Global warming potential greenhouse gas								
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.								
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The 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.								

Environmental Performance

Resource use indicators according to EN 15804

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ, net calorific value	9.62E-01	1.53E-03	1.07E-05	8.13E-04	3.85E-03	6.20E-03	7.92E-01
PERM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	9.62E-01	1.53E-03	1.07E-05	8.13E-04	3.85E-03	6.20E-03	7.92E-01
PENRE	MJ, net calorific value	2.10E+01	6.13E-01	4.90E-03	3.26E-01	5.75E-02	7.13E-03	-8.94E+00
PENRM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	2.10E+01	6.13E-01	4.90E-03	3.26E-01	5.75E-02	7.13E-03	-8.94E+00
SM	kg	2.54E-01	3.16E-07	9.86E-09	1.68E-07	1.64E-07	1.43E-08	9.62E-01
RSF	MJ, net calorific value	6.54E-04	2.62E-08	1.71E-09	1.39E-08	1.51E-08	5.23E-03	1.79E-05
NRSF	MJ, net calorific value	2.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-08	0.00E+00
FW	m^3	2.00E-02	1.19E-05	1.48E-07	6.31E-06	1.14E-05	2.18E-07	4.24E-03
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water							
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.							

Waste indicators according to EN 15804

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	3.51E-01	2.34E-05	5.14E-07	1.24E-05	3.50E-05	7.48E-07	2.08E-01
NHWD	kg	5.86E+00	1.98E-03	1.76E-05	1.05E-03	3.31E-03	2.57E-05	-1.90E+00
RWD	kg	4.67E-06	3.70E-08	2.29E-10	1.97E-08	1.24E-07	2.51E-06	2.59E-05
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed.							
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.							

Output flow indicators according to EN 15804

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.50E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.							
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.							

Abbreviations

Abbreviation	Definition
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification

Version History

Original version of the EPD, 2026-01-16.

References

EN 15804:2012+A2:2019 + AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

PCR 2019:14 (ver. 2.0.1) Construction products (EN 15804:A2)

ISO 14040:2021 “Environmental management - Life cycle assessment - Principles and framework”.

ISO 14044:2018 “Environmental management - Life cycle assessment - Requirements and guidelines”.

ISO 14025:2006 “Environmental labels and declarations - Type III environmental declarations - Principles and procedures”.

General Program Instructions of International EPD System, (Ver. 5.0.1) 2025-02-27 “General Programme Instructions for International EPD System”.

Ecoinvent database (v3.11) - www.ecoinvent.org

Kardemir www.kardemir.com

Metsims www.metsims.com

Additional LCA Results

In compliance with the PCR requirements, 100% end-of-life scenarios have been modelled for the product. Tables below present the results for modules C3, C4 and D (affected modules) based on these scenarios, covering all the impact indicators as specified in EN 15804.

100% recycling scenario

Indicator	Unit	C3	C4	D
GWP-total	kg CO_2 eq.	3.82E-03	0.00E+00	-1.23E+00
GWP-fossil	kg CO_2 eq.	3.79E-03	0.00E+00	-1.24E+00
GWP-biogenic	kg CO_2 eq.	2.80E-05	0.00E+00	8.13E-03
GWP-luluc	kg CO_2 eq.	2.26E-06	0.00E+00	4.07E-04
ODP	kg CFC-11 eq.	5.98E-11	0.00E+00	-1.43E-09
AP	mol H+ eq.	3.24E-05	0.00E+00	-3.88E-03
EP-freshwater	kg P eq.	6.44E-07	0.00E+00	-4.09E-04
EP- marine	kg N eq.	1.43E-05	0.00E+00	-9.61E-04
EP-terrestrial	mol N eq.	1.55E-04	0.00E+00	-1.05E-02
POCP	kg NMVOC eq.	4.62E-05	0.00E+00	-3.75E-03
ADP - minerals & metals	kg Sb eq.	1.73E-10	0.00E+00	1.09E-07
ADP-fossil	MJ, net calorific value	5.74E-02	0.00E+00	-1.08E+01
WDP	m^3 world eq. deprived	5.86E-04	0.00E+00	2.43E-01
GWP-GHG	kg CO_2 eq.	3.82E-03	0.00E+00	-1.23E+00
PERE	MJ, net calorific value	3.85E-03	0.00E+00	9.31E-01
PERM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	3.85E-03	0.00E+00	9.31E-01
PENRE	MJ, net calorific value	5.75E-02	0.00E+00	-1.05E+01
PENRM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	5.75E-02	0.00E+00	-1.05E+01
SM	kg	1.64E-07	0.00E+00	1.13E+00
RSF	MJ, net calorific value	1.51E-08	0.00E+00	2.10E-05
NRSF	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.14E-05	0.00E+00	4.98E-03
HWD	kg	3.50E-05	0.00E+00	2.18E-01
NHWD	kg	3.31E-03	0.00E+00	-2.00E+00
RWD	kg	1.24E-07	0.00E+00	2.72E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	1.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00
EEE	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
EET	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00

Additional LCA Results

In compliance with the PCR requirements, 100% end-of-life scenarios have been modelled for the product. Tables below present the results for modules C3, C4 and D (affected modules) based on these scenarios, covering all the impact indicators as specified in EN 15804.

100% disposal scenario

Indicator	Unit	C3	C4	D
GWP-total	kg CO_2 eq.	0.00E+00	2.72E-03	0.00E+00
GWP-fossil	kg CO_2 eq.	0.00E+00	2.72E-03	0.00E+00
GWP-biogenic	kg CO_2 eq.	0.00E+00	9.09E-07	0.00E+00
GWP-luluc	kg CO_2 eq.	0.00E+00	1.33E-07	0.00E+00
ODP	kg CFC-11 eq.	0.00E+00	4.02E-11	0.00E+00
AP	mol H+ eq.	0.00E+00	2.47E-05	0.00E+00
EP-freshwater	kg P eq.	0.00E+00	8.21E-08	0.00E+00
EP- marine	kg N eq.	0.00E+00	1.12E-05	0.00E+00
EP-terrestrial	mol N eq.	0.00E+00	1.23E-04	0.00E+00
POCP	kg NMVOC eq.	0.00E+00	3.72E-05	0.00E+00
ADP - minerals & metals	kg Sb eq.	0.00E+00	1.07E-10	0.00E+00
ADP-fossil	MJ, net calorific value	0.00E+00	3.49E-02	0.00E+00
WDP	m^3 world eq. deprived	0.00E+00	4.97E-05	0.00E+00
GWP-GHG	kg CO_2 eq.	0.00E+00	2.72E-03	0.00E+00
PERE	MJ, net calorific value	0.00E+00	4.24E-03	0.00E+00
PERM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	0.00E+00	4.24E-03	0.00E+00
PENRE	MJ, net calorific value	0.00E+00	6.33E-02	0.00E+00
PENRM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	0.00E+00	6.33E-02	0.00E+00
SM	kg	0.00E+00	1.80E-07	0.00E+00
RSF	MJ, net calorific value	0.00E+00	1.66E-08	0.00E+00
NRSF	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
FW	m^3	0.00E+00	1.25E-05	0.00E+00
HWD	kg	0.00E+00	7.48E-07	0.00E+00
NHWD	kg	0.00E+00	2.57E-05	0.00E+00
RWD	kg	0.00E+00	2.51E-06	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00
EEE	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
EET	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00

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