Environmental Product Declaration

Statement of Verification

CARES EPD No.: 0068

Issue 00

This is to verify that the

Environmental Product Declaration

Provided by:
İÇDAŞ Çelik Enerji Tersane ve Ulaşim Sanayi A.Ş.

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 production route)

Company address:

17950 Biga
Çanakkale
Türkiye

LadinCamci	Ladin Camci	01 May 2026
Signed for CARES	Operator	Date of this Issue
01 May 2026		30 April 2029
First Issue Date		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

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Environmental Product Declaration

EPD Number: CARES EPD 0068

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)

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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

İÇDAŞ Çelik Enerji Tersane ve Ulaşim Sanayi A.Ş.
17950 Biga
Çanakkale
Türkiye

Construction Product:

Product Description

This EPD covers carbon steel wire rod in coils manufactured by İÇDAŞ Çelik Enerji Tersane ve Ulaşım Sanayi A.Ş. (İÇDAŞ). The products are manufactured via a hybrid production route utilizing a weighted blend of internally produced steel (scrap-based with Pig Iron supplements) and externally sourced steel billets produced via the gas-based DRI route.

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.

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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)	80.4 (Including internal and external scrap)

Main Product Contents

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

Manufacturing Process

Carbon steel wire rods at İÇDAŞ Çelik Enerji Tersane ve Ulaşım Sanayi A.Ş. (İÇDAŞ) are produced via a hybrid manufacturing route, incorporating both internally produced steel and externally sourced semi-finished products.

The facility produces a significant portion of its steel requirements using the secondary (scrap-based) route. Steel scrap, supplemented with Pig Iron, is melted in an Electric Arc Furnace (EAF) and refined in a Ladle Furnace (LF). This refining process removes impurities and incorporates specific alloying elements to achieve the required chemical composition. The molten steel is then cast into billets through a continuous casting process.

The manufacturing process also utilizes purchased steel billets produced via the gas-based DRI production route. Both internally produced and externally sourced billets are reheated and processed through a high-speed hot rolling mill. The steel is reduced to the specified diameter and formed into continuous coils.

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.

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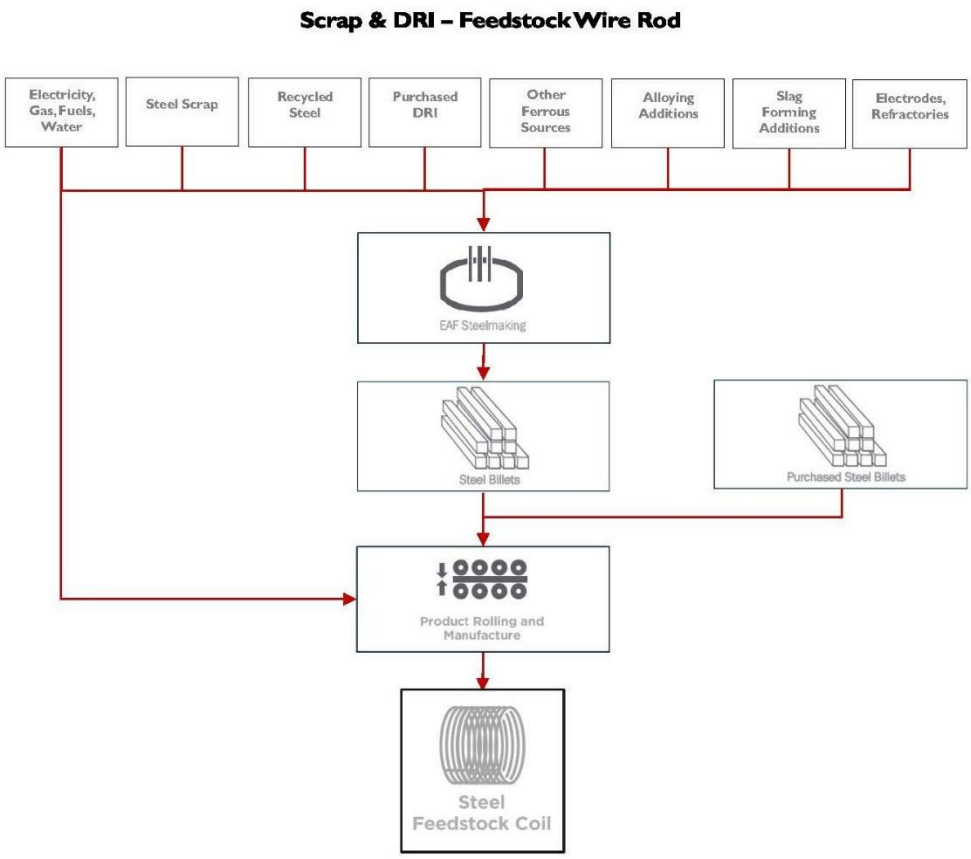
Process flow diagram



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 wire rods 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.

It is a high value resource, so efforts are made to recycle steel scrap rather than disposing of it at EoL. A recycling rate of 92% is typical for reinforcing steel products

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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.

Once steel scrap has been collected for recycling it is considered to have reached the end of waste state.

Data sources, quality and allocation

Data Sources and Quality:

The selection of data and the data quality requirements have been provided according to the requirements of BS EN 15941:2024.

Data Sources: Manufacturing data of the high tensile steel strand products for the prestressing of concrete covering the period 01/01/2025 - 31/12/2025 has been provided by İÇDAŞ operating on the geographical area noted in Manufacturing Site. A brief description of technology and inputs for the product is given in Manufacturing Process and in simplified Process Flow Diagram.

The primary data collection was thorough, considering all relevant flows and these data were verified by CARES, including also the verification of mass balance, to ensure that data for all the inputs and outputs for the process over the period of data collection have been collected, and that the unit process data will comply with the cut-off rules of EN 15804:2012+A2:2019/AC2021. The EPD covers transport to, and end-of-life in Türkiye.

The selection of the background data for electricity generation is in line with the CARES PCR 2025. Country or region-specific power grid mixes are selected from MLC (GaBi) Databases 2025.1 (Sphera, 2025); thus, consumption grid mix of Türkiye has been selected to suit specific manufacturing location, and also for fabrication, installation and demolishing location. The emission factor of carbon footprint of the applied consumption grid mix of Türkiye is 0.559 kg CO_2 eq/kWh.

Data Quality: Background data is consistently sourced from the MLC (GaBi) Databases 2025.1 (Sphera, 2025). The primary data collection was thorough, considering all relevant flows and these data have been verified during the audit conducted by CARES in March 2026.

There isn't any data from different LCI/LCA databases are used considering that the overall consistency of the study is not adversely affected.

Schemes applied for data quality assessment was as per EN 15804:2012+A2:2019, 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 was found during the assessment of relevant data.

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Data quality level and criteria of the UN Environment Global Guidance on LCA database development:

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

Allocation:

EAF 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. The revenue generated from both mill scale, and induction furnace slag are 0.005% and 0.33% respectively, and their total is less than 1% in relation to the product based on current market prices, these co-products are of definite value and are freely/readily traded in reality. For this reason, economic allocation has been applied to the processes where these co-products arise.

Production losses of steel during the production process are recycled in a closed loop offsetting the requirement for external scrap. Specific information on allocation within the b 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.

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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	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg P eq
Product stage	Raw material supply	A1	764	761	1.83	0.710	3.13E-09	3.00	6.09E-04
	Transport	A2	68.7	68.6	0.072	0.028	6.57E-12	2.19	2.38E-05
	Manufacturing	A3	517	514	1.43	0.97	3.19E-09	1.42	3.28E-04
	Total (of product stage)	A1-3	1.35E+03	1.34E+03	3.33	1.71	6.33E-09	6.61	9.61E-04
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	2.09	2.09	8.33E-04	6.83E-05	1.62E-13	0.012	2.52E-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	27.3	27.3	-0.006	0.013	1.39E-11	0.063	9.54E-06
100% Landfill Scenario									
End of life	Deconstruction, demolition	C1	2.09	2.09	8.33E-04	6.83E-05	1.62E-13	0.012	2.52E-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	2.03E+03	2.03E+03	-0.475	0.992	1.04E-09	4.68	7.11E-04
100% Recycling Scenario									
End of life	Deconstruction, demolition	C1	2.09	2.09	8.33E-04	6.83E-05	1.62E-13	0.012	2.52E-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	-147	-147	0.034	-0.072	-7.51E-11	-0.339	-5.15E-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

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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	0.591	6.46	1.78	3.48E-04	8.62E+03	61.7
	Transport	A2	0.516	5.65	1.48	1.83E-06	807	0.133
	Manufacturing	A3	0.289	3.87	0.782	2.92E-05	6.13E+03	230
	Total (of product stage)	A1-3	1.40	16.0	4.04	3.79E-04	1.56E+04	2.92E+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	4.08E-03	0.045	0.011	2.94E-08	27.7	0.016
	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	0.015	0.163	0.051	2.70E-07	207	0.192
100% Landfill Scenario								
End of life	Deconstruction, demolition	C1	4.08E-03	0.045	0.011	2.94E-08	27.7	0.016
	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	1.13	12.1	3.78	2.01E-05	1.54E+04	14.3
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	4.08E-03	0.045	0.011	2.94E-08	27.7	0.016
	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	-0.081	-0.877	-0.273	-1.46E-06	-1.12E+03	-1.03

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.

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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	3.69E-05	28.5	1.33E+03	1.20E-07	4.06E-06	1.41E+03
	Transport	A2	3.83E-05	0.132	607	9.22E-09	1.75E-07	16.4
	Manufacturing	A3	2.31E-05	0.697	6.94E+03	8.71E-08	2.04E-06	899
	Total (of product stage)	A1-3	9.83E-05	29.3	8.88E+03	2.16E-07	6.28E-06	2.33E+03
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	7.82E-08	5.77E-04	32.9	5.92E-10	7.53E-09	0.036
	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	9.24E-07	-0.359	32	4.34E-08	-3.30E-08	-16.7
100% Lanfill Scenario								
End of life	Deconstruction, demolition	C1	7.82E-08	5.77E-04	32.9	5.92E-10	7.53E-09	0.036
	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	6.89E-05	-26.8	2.41E+03	3.24E-06	-2.46E-06	-1.25E+03
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	7.82E-08	5.77E-04	32.9	5.92E-10	7.53E-09	0.036
	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	-4.99E-06	1.94	-174	-2.34E-07	1.78E-07	90.3

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.

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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	1.13E+03	0	1.13E+03	8.62E+03	0	8.62E+03
	Transport	A2	6.22	0	6.22	807	0	807
	Manufacturing	A3	3.09E+03	0	3.09E+03	6.13E+03	0	6.13E+03
	Total (of product stage)	A1-3	4.23E+03	0	4.23E+03	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	0.056	0	0.056	27.7	0	27.7
	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	-32.6	0	-32.6	207	0	207
100% Landfill Scenario								
End of life	Deconstruction, demolition	C1	0.056	0	0.056	27.7	0	27.7
	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	-2.43E+03	0	-2.43E+03	1.54E+04	0	1.54E+04
100% Recycling Scenario								
End of life	Deconstruction, demolition	C1	0.056	0	0.056	27.7	0	27.7
	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	176	0	176	-1.12E+03	0	-1.12E+03

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

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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	m³
Product stage	Raw material supply	A1	0	0	0	2.06
	Transport	A2	0	0	0	0.006
	Manufacturing	A3	983	0	0	4.85
	Total (of product stage)	A1-3	983	0	0	6.92
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	4.04E-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	0.016
100% Landfill Scenario						
End of life	Deconstruction, demolition	C1	0	0	0	4.04E-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	1.18
100% Recycling Scenario						
End of life	Deconstruction, demolition	C1	0	0	0	4.04E-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	-0.086

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

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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	2.12E-06	7.12	0.200
	Transport	A2	2.81E-08	0.067	9.62E-04
	Manufacturing	A3	3.51E-06	70.4	0.008
	Total (of product stage)	A1-3	5.66E-06	77.6	0.209
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	4.71E-10	0.004	7.85E-06
	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	-7.74E-08	0.420	-0.003
100% Landfill Scenario					
End of life	Deconstruction, demolition	C1	4.71E-10	0.004	7.85E-06
	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	-5.77E-06	31.3	-0.256
100% Recycling Scenario					
End of life	Deconstruction, demolition	C1	4.71E-10	0.004	7.85E-06
	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	4.18E-07	-2.26	0.019

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

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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

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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 reinforcing 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 Türkiye. 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/m³	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/m³	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 or in IF 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. Because the manufacturing route incorporates significant amounts of primary iron sources including Pig Iron in the EAF charge and DRI via purchased DRI-route billets, the system acts as a net producer of scrap. Consequently, Module D reports a net environmental credit representing the avoided primary production of steel in the next product system. The resulting scrap credit/burden is calculated based on the global "value of scrap" approach (/worldsteel 2011).		
	Recycled Content	kg	804
	Re-used Content	kg	0
	Recovered for recycling	kg	920
	Recovered for re-use	kg	0
	Recovered for energy	kg	0

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Summary, comments and additional information

Interpretation

Scrap and DRI based wire rod steel product of İÇDAŞ Çelik Enerji Tersane ve Ulaşim Sanayi A.Ş. 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 %
Steelmaking	942	69.8
Rolling	407	30.2
Total (A1-A3)	**1.35E+03**	**100.0**

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