Łukasiewicz
Institute of Ceramics
and Building Materials

HUTA ŁABĘDY S.A.
GRUPA KAPITAŁOWA WĘGLOKOKS

ENVIRONMENTAL PRODUCT DECLARATION

no. 04-04/2026

Hot-rolled sections

HUTA ŁABĘDY S.A.

Owner of the declaration:	*HUTA ŁABĘDY S.A.*
Program owner:	*Łukasiewicz Research Network – Institute of Ceramics and Building Materials Environmental Engineering Center*
Data of issue:	***20.04.2026***
Declaration valid until:	***20.04.2031***

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1. GENERAL INFORMATION

Product of declaration	Hot-rolled sections: • channel sections, • I-sections, • bulb flats.
Program owner:	Łukasiewicz Research Network – Institute of Ceramics and Building Materials Environmental Engineering Center in Opole. **http:/www.icimb.lukasiewicz.gov.pl/**
Declaration owner:	HUTA ŁABĘDY S.A. 45 Anny Jagiellonki str. 44-109 Gliwice Telephone: +48 234 72 01 Adres: e-mail: office@hutalab.com.pl **https:/ www.hutalab.com.pl/**

Declared unit:	**1 tonne**

This verified Environmental Product Declaration (EPD) applies only to specific products and is valid for a period of five years from the date of publication in accordance with PN-EN 15804+A2:2020-03.

Life Cycle Analysis (LCA):	A1-A3, C1-C4 and D according to PN-EN 15804+A2:2020-03 (Cradle-to-Gate with options)
Product Categorization (PCR) Rules	PN-EN 15804+A2:2020-03 Sustainability of construction works. Environmental Product Declarations. Basic principles of categorization of construction products, ICIMB-PCR.
Representatives:	Polish product, year 2025
Declared durability:	more than50 years
Reasons for performing LCA:	B2B
Standard of product:	Channel sections - PN-EN 10279, PN-EN 10365 I-sections - PN-EN 10024, PN-EN 10365 Bulb flats - PN-EN 10067

Publication:	ICIMB, www.icimb.lukasiewicz.gov.pl/oferta/deklaracje-srodowiskowe/

Declarations that are the result of different programs or are not performed in accordance with the standard may not be comparable.

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The Łukasiewicz – Institute of Ceramics and Building Materials Environmental Engineering Center provides access to the Type III environmental declaration for hot-rolled sections to interested parties.
The declaration owner is responsible for the information and the base evidence. Łukasiewicz Research Network - Institute of Ceramics and Building Materials Center for Environmental Engineering is not responsible for the manufacturer's information and data and evidence regarding the life cycle assessment.
The Łukasiewicz Research Network – Institute of Ceramics and Building Materials is a public Research Organization and a Notified Body (reg. no. 1487) to the European Commission and other Member States European Union designated for tasks concerning the assessment of the performance of construction products. The Łukasiewicz Research Network - Institute of Ceramics and Building Materials is accredited (reg. no. AB 054) for a testing laboratory and accreditation (reg. no. AC 008) for testing and certification of building materials.

Approved:	**Review:**
Joanna Poluszyńska, PhD Director of the Environmental Engineering Center Ewa Głodek-Bucyk, Ph.D Leader of the Process Engineering Research Group	CEN standard PN-EN 15804+A2:2020-03 serves as the main PCR document. Independent verification of declarations and data according to EN ISO 14025:2010 ☐ Internal ☒ External Katarzyna Grzesik, PhD, DSc
Authors' team:	Katarzyna Kiprian, M.Sc. Ewa Głodek-Bucyk, Ph.D. Patryk Okoń, M.Sc. Eng. Kamil Ryfiak

2. MANUFACTURER AND PRODUCT INFORMATION

HUTA ŁABĘDY S.A. is one of the oldest Silesian steelworks. Its beginnings date back to 1848, when the construction of the plant, then called "Hermina Steelworks", began. The main product of this plant were rolled products in five small rolling mills, for which the charge was supplied by about twenty pudding furnaces. The first departments of the Steelworks rebuilt after World War II were launched in 1948. In recent decades, it has been modernized many times.

Figure 1. Headquarters HUTA ŁABĘDY S.A. in Gliwice.

Channel sections, I-sections and bulb flats.

Channel sections from C100 to C180 and I-sections I120 and I140 are extremely versatile structural materials that are gaining popularity in many industries. Thanks to their high strength and versatile applications, they are used both in lightweight structures and in high-tech engineering projects.

Bulb Flats manufactured at HUTA ŁABĘDY are mainly used in the shipbuilding industry. They are an alternative to heavier flat or angle bars, providing greater resistance to buckling. They are also a cost-effective and corrosion-resistant solution for sheet metal reinforcement.

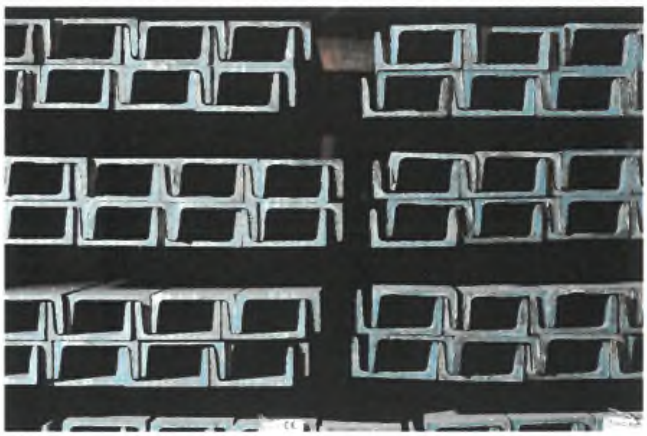


Figure 2. Channel sections.

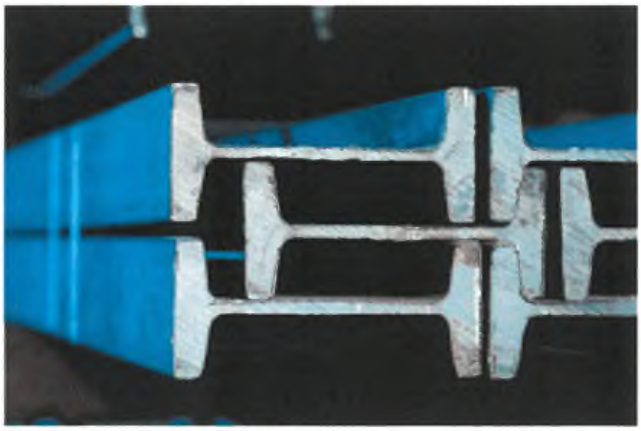


Figure 3. I-sections.

Table 1. Composition of the product covered by the environmental declaration:

Raw material	Share [%]
Steel	100

For the production of hot-rolled sections, steel billets from COS are used.
Steel billets are directed to the rolling line, where they are given the desired shape and mechanical parameters. In the final stage, the products are straightened and labeled. The sections are transported in bundles.

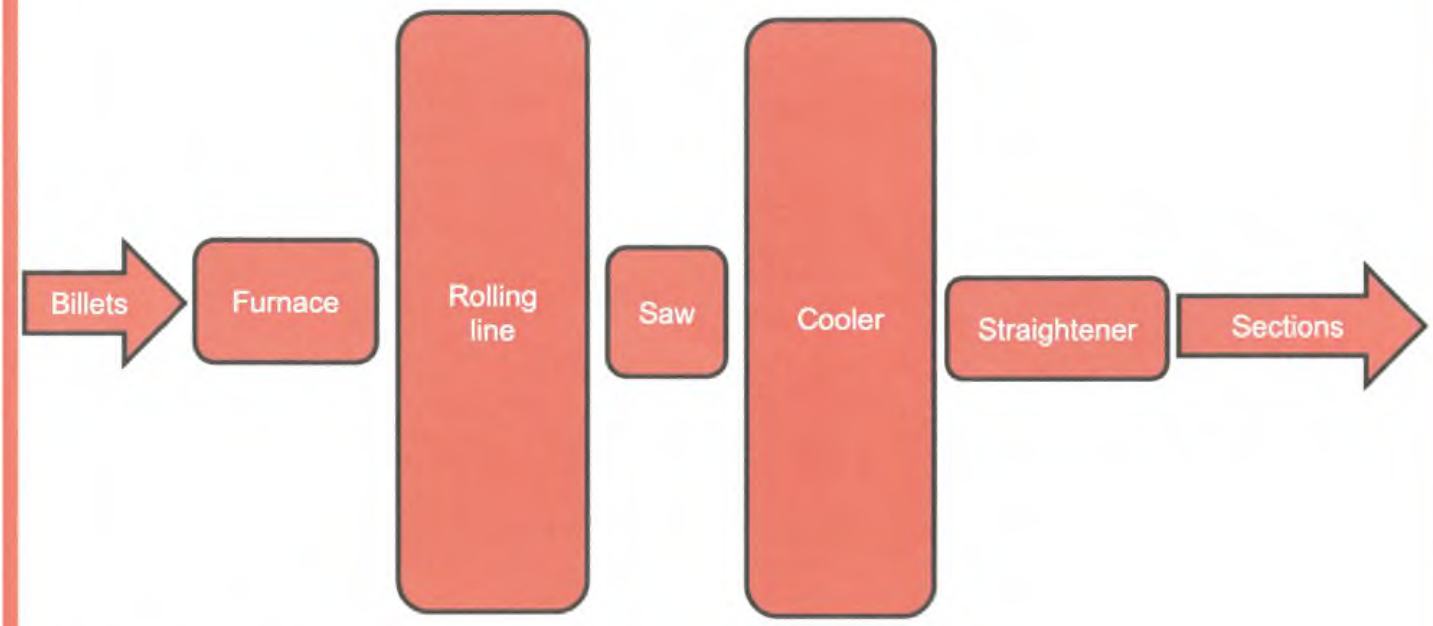


Figure 4. Production scheme of hot-rolled sections.

3. LCA: CALCULATION RULES

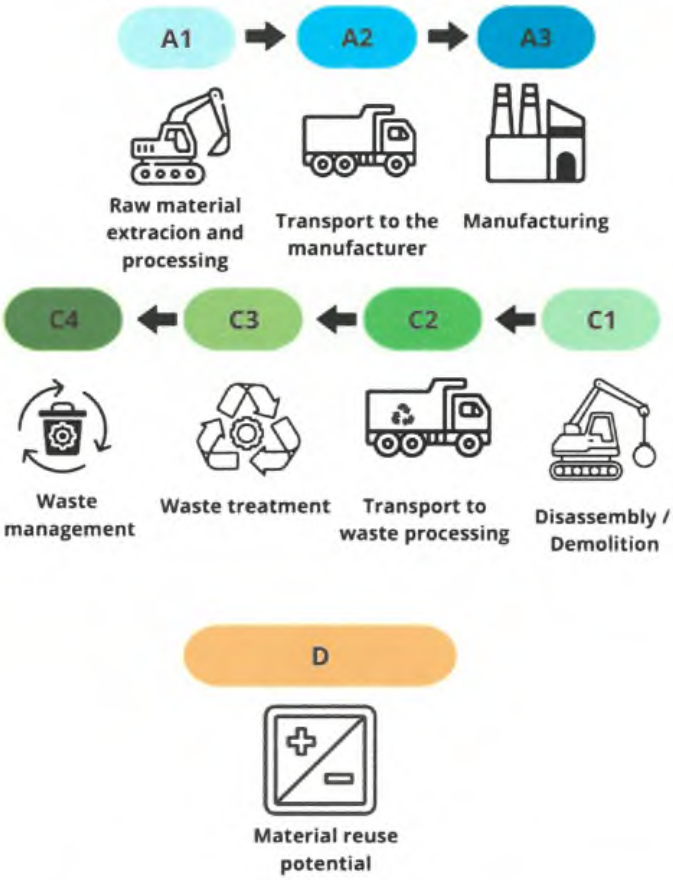
The environmental declaration is based on the averaged data provided by the owner of the declaration HUTA ŁABĘDY S.A., for one production plant located in Gliwice, Anny Jagiellonki 45 street. Life Cycle Analysis (LCA) was performed for the product group: Hot-rolled sections, including:

- channel sections,
- I-sections,
- bulb flats.

The calculations were made in relation to the declared unit of 1 tonne of product, using uniform technological and organizational assumptions for the entire product group.

System limitations

The LCA analysis was carried out in accordance with the requirements of PN-EN 15804+A2:2020-03, PN-EN ISO 14025, PN-EN ISO 14040 and PN-EN ISO 14044.



Data colleration period

Data on the production process was provided in 2026 for the period 01.01.2025 - 31.12.2025 (12 months) and correspond to the production technology of the time.

Declared unit

1 tonne

Assumptions

A1 - extraction and consumption of raw materials refers to specific mass shares in the production process, per unit declared of the product.
A2 – distances from the place of obtaining raw materials to the production plant individual for each raw material, means of transport differentiated due to the method of delivery of raw materials.

A3 – covers the production processes carried out at the manufacturer's plant, including energy consumption and emissions (i.a. CO_2, NO_x, SO_2 and particulate matter), based on data provided by the manufacturer.
C1 – describes the handling of sections and pipes with a cold-profiled seam at the dismantling or demolition stage. The calculations were made on the basis of an end-of-life scenario.
C2 – refers to the transport of waste to a recovery or disposal facility. The calculations were made on the basis of the developed scenario.
C3 – takes into account the environmental impacts associated with the treatment of demolition waste, containing sections and pipes with a cold-profiled seam, in waste treatment plants. The calculations were made on the basis of the developed scenario.
C4 – covers the environmental impact of waste disposal processes, in particular the storage of fractions that cannot be further managed. The calculations were made on the basis of the developed scenario.
D – addresses the potential benefits and environmental burdens beyond the system boundaries resulting from material recovery and reuse of steel, modelled as a substitute for the production of virgin materials. The calculations were made on the basis of the developed scenario.

System boundary exclusions

Due to the characteristics of the product and its functional function, the following life cycle modules have been excluded from the system boundaries:

- A4–A5 – transport to the construction site and assembly process,
- B1–B7 – stage of use.

The exclusion of these modules is due to the fact that steel sections and pipes are passive products that do not consume energy or water during the use phase and do not generate the direct environmental impacts attributed to the product itself. The assembly and operation processes depend on the specifics of the facility and remain outside the scope of this declaration.

Cut-off criteria

The LCA includes at least 99% of all relevant mass fluxes related to the declared entity. The total energy consumption within the system boundaries has been included in the environmental declaration. The omitted flows do not exceed 1% of the mass or energy share and do not have a significant impact on the final results of the LCIA analysis

General data

The data for the calculation come from Ecoinvent v. 3.10 and have been supplemented with KOBiZE CO_2, SO_2, NO_x, CO and total particulate matter emission indicators for electricity based on the information contained in the National Database on Greenhouse Gas and Other Substance Emissions for 2023, December 2024.
Emission coefficients for electricity were determined with the actual KOBiZE data. The Polish electricity emission index (Ecoinvent supplemented with current national data from KOBiZE) is 0.553 kg CO_2/kWh. The electricity taken into account in production (A3) is modelled according to the energy mix presented in the certificate provided by the electricity supplier.
A detailed analysis of the data quality was part of the external audit. Life Cycle Analysis (LCA) was performed using the ICIMB-PCR tool developed in accordance with EN 15804+A2 using the EF 3.1 method.

Allocation	All data on components produced in one plant were provided by the owner of the declaration HUTA ŁABĘDY S.A. and were referred to the declared unit of the product – 1 tonne. The allocation rules used in this EPD are based on the general ICIMB-PCR principles.

4. LCA: SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

The life cycle assessment was developed in accordance with the requirements of the standards PN-EN 15804+A2:2020-03, PN-EN ISO 14025, and PN-EN ISO 14040. The product category rules were adopted in accordance with the PN-EN 15804+A2:2020-03 standard.

For the purpose of the life cycle analysis of the products covered by the environmental declaration within the scope of "cradle to gate with options," scenarios were developed for modules C1–C4 and D:

Module C1 – De-construction/demolition - End-of-life process involves manual and mechanical disassembly carried out on the construction site, using power tools and standard construction equipment (i.a. drills, angle grinders, impact wrenches).
Dismantling involves separating steel elements from other building materials. At the demolition stage, preliminary sorting of waste is carried out at the place of its origin, enabling the separation of the following material streams:

- fraction intended for material recycling,
- fraction intended for reuse,
- fraction intended for storage.

The environmental impact of module C1 includes dismantling, segregation processes and has been taken into account in accordance with the approach adopted for the end-of-life stage. Energy consumption and dismantling emissions were taken into account on the basis of averaged data for demolition works.

Module C2 – Transport – After initial segregation, the steel waste is transported to the appropriate waste management facilities. Transport is carried out by trucks with a load capacity of 16–32 tons, meeting the requirements of the EURO 6 emission standard.
The following averaged transport scenarios were adopted:

- transport to a reuse plant: 100 km,
- transport to the material recycling plant (steelworks): 100 km,
- transport to landfill: 100 km.

Module C3 - **Waste treatment** - Steel waste from the dismantling of hot-rolled sections is sent to the scrap processing plant before the material recycling process. Module C3 includes the following operations:

- unloading of steel waste,
- cutting steel scrap using an oxy-gas torch,
- internal transport and loading with the use of handling equipment (forklifts, loaders),
- preparation of material for shipment to the metallurgical plant.

The following power consumption is assumed:

- cutting with an oxy-gas torch: 0.18 MJ/kg of waste,
- loading and unloading operations: 0.002 MJ/kg of waste.

Module C3 does not cover external transport or material recycling processes in the smelter. No mass losses or energy recovery are included.

Module C4 – Waste management – Based on the adopted end-of-life scenario, it was assumed that 1% of the mass of steel waste after processing processes (C3) is directed to landfill.
The remainder of the material stream is subject to material recovery or reuse. Storage applies only to fractions that cannot be managed in any other way.

Module D - **Benefits and Off-System Loads** - Module D covers the potential environmental benefits of reuse and material recycling of steel products at the end of their life cycle.
The following division of material streams has been adopted:

- 88% of the weight of the product – material recycling (steel scrap),
- 11% of product weight – reuse,
- 1% of the product weight – waste storage.

Material recycling of steel scrap is modeled as a substitute for the production of virgin steel in BFBOF and EAF technologies, in accordance with the substitution approach (avoided burden).
The substitution efficiency and scrap quality were assumed in accordance with the European average data for structural steel scrap streams.
The calculations were carried out in accordance with the LCA for steel construction https://op.europa.eu/, and with the approach developed by the World Steel Association.

The end-of-life scenario has been developed in accordance with the requirements of PN-EN 15804+A2:2020-03 and refers to typical European conditions for the dismantling, processing and management of steel waste.

5. LCA: RESULTS

The table below shows the LCA modules taken into account in the calculation of the environmental impact categories for the products covered by the declaration.

SYSTEM BOUNDARIES (X –MODULE INCLUDED IN LCA, MND – MODULE NOT DECLARED)

Products stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport	Production	Transport	Construction process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
EU	EU	PL	X	X	X	X	X	X	X	X		EU	EU	EU	EU	EU

The following tables present the results of the LCA analysis to hot-rolled sections. The abbreviations used to describe the impact categories are explained below:

GWP-total	Global Warming Potential
GWP-fossil	Global Warming Potential fossil fuel
GWP-biogenic	Global Warming Potential biogenic
GWP-luluc	Global Warming Potential land use and land 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-terrestial	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
PM	Potential incidence of disease due to PM emissions
IRP	Potential Human exposure efficiency relative to U235
ETP-fw	Potential comparative Toxic Unit for ecosystems
HTP-c	Potential comparative Toxic Unit for humans (cancerogenic)
HTP-nc	Potential comparative Toxic Unit for humans (non-cancerogenic)
SQP	Potential soil quality index
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

PEN-RE	Use of non-renewable primary energy resources excluding non-renewable primary energy resources used as raw materials
RE	Use of non-renewable primary energy resources used as raw materials
PENRT	Total use of non-renewable primary energy resources
SM	Use of secondary material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Net use of fresh water

MAIN IMPACT INDICATORS: 1 tonne hot-rolled sections

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	5,85E+02	1,48E+01	1,81E+02	7,64E+00	1,90E+01	1,45E+01	3,07E-01	-2,49E+02
GWP-fossil	kg CO_2 eq.	5,83E+02	1,47E+01	1,80E+02	7,58E+00	1,90E+01	1,45E+01	3,06E-01	-2,45E+02
GWP-biogenic	kg CO_2 eq.	1,61E+00	1,07E-01	4,49E-01	5,17E-02	1,32E-02	5,11E-03	8,11E-04	-3,48E+00
GWP-luluc	kg CO_2 eq.	8,14E-01	1,85E-02	6,64E-02	7,06E-03	6,31E-03	1,09E-03	3,19E-05	-3,40E-01
ODP	kg CFC11 eq.	7,36E-06	2,13E-07	5,64E-06	4,15E-08	3,78E-07	6,08E-07	4,72E-09	-2,90E-06
AP	mol H+ eq.	2,60E+00	1,10E-01	2,99E-01	4,28E-02	3,96E-02	1,50E-02	2,71E-03	-1,09E+00
EP-freshwater	kg P eq.	3,10E-01	4,61E-03	5,78E-02	6,92E-03	1,29E-03	2,49E-04	9,04E-06	-1,31E-01
EP-marine	kg N eq.	5,67E-01	4,16E-02	7,18E-02	1,28E-02	9,51E-03	5,98E-03	1,25E-03	-2,38E-01
EP-terrestrial	mol N eq.	5,85E+00	4,47E-01	6,64E-01	1,26E-01	1,03E-01	6,41E-02	1,37E-02	-2,46E+00
POCP	kg NMVOC eq.	1,88E+00	1,33E-01	3,18E-01	3,70E-02	6,58E-02	3,28E-02	4,11E-03	-7,89E-01
ADP-minerals & metals	kg Sb eq.	3,33E-03	4,27E-05	1,18E-04	1,01E-05	6,18E-05	3,81E-06	1,25E-07	-1,40E-03
ADP-fossil	MJ	8,31E+03	2,13E+02	2,59E+03	8,68E+01	2,67E+02	2,29E+02	4,00E+00	-3,50E+03
WDP	(m^3) world eq. deprived	3,08E+02	2,13E+00	4,39E+00	3,82E-01	1,11E+00	2,35E-01	8,66E-03	-1,30E+02

ADDITIONAL IMPACT INDICATORS: 1 tonne hot-rolled sections

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidency	6,12E-05	1,25E-06	1,04E-06	5,66E-07	1,40E-06	2,16E-07	7,83E-08	-2,57E-05
IRP	kBq U235 eq.	1,50E+02	2,30E+00	1,37E+00	6,81E-02	3,47E-01	9,01E-02	2,21E-03	-6,31E+01
ETP-fw	CTUe	1,93E-01	2,87E-03	3,60E-02	4,31E-03	8,01E-04	9,45E-04	5,62E-06	-8,13E-02
HTP-c	CTUsieh	7,15E-06	1,97E-07	2,51E-07	1,39E-08	1,35E-07	2,38E-08	1,18E-09	-2,99E-06
HTP-nc	CTUh	9,81E-06	1,10E-07	7,66E-07	7,51E-08	1,68E-07	1,60E-08	5,40E-10	-4,13E-06
SQP	-	3,61E+03	1,36E+02	8,62E+01	2,11E+01	1,61E+02	3,53E+00	4,93E+00	-1,23E+03

INDICATORS DESCRIBTIONS RESOURCE CONSUMPTION: 1 tonne hot-rolled sections

	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,54E+03	2,25E+01	8,39E+01	9,88E+00	4,59E+00	1,08E+00	1,19E-01	-5,94E+02
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,54E+03	2,25E+01	8,39E+01	9,88E+00	4,59E+00	1,08E+00	1,19E-01	-5,94E+02
PEN-RE	MJ	8,75E+03	2,25E+02	2,85E+03	9,21E+01	2,84E+02	2,53E+02	4,26E+00	-3,68E+03
RE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	8,75E+03	2,25E+02	2,85E+03	9,21E+01	2,84E+02	2,53E+02	4,26E+00	-3,68E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	3,15E+01	4,52E-01	9,37E-01	1,11E-01	3,69E-03	8,85E-02	1,11E-03	5,58E-04

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 tonne hot-rolled sections

	Life Cycle Stage								
Indicator	**Unit (expressed per DU)**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste	kg	WN	WN	7,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	9,07E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	4,58E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CARBON BIOGENIC	
Contents organic carbon in product (kg C_{org})	**0,00E+00**
Contents organic carbon in packaging (kg C_{org})	**3,13E-03**

6. INTERPRETATION OF LCA

Figure 5 present diagram of the shares of individual life cycle modules on the basic impact categories for hot-rolled sections:

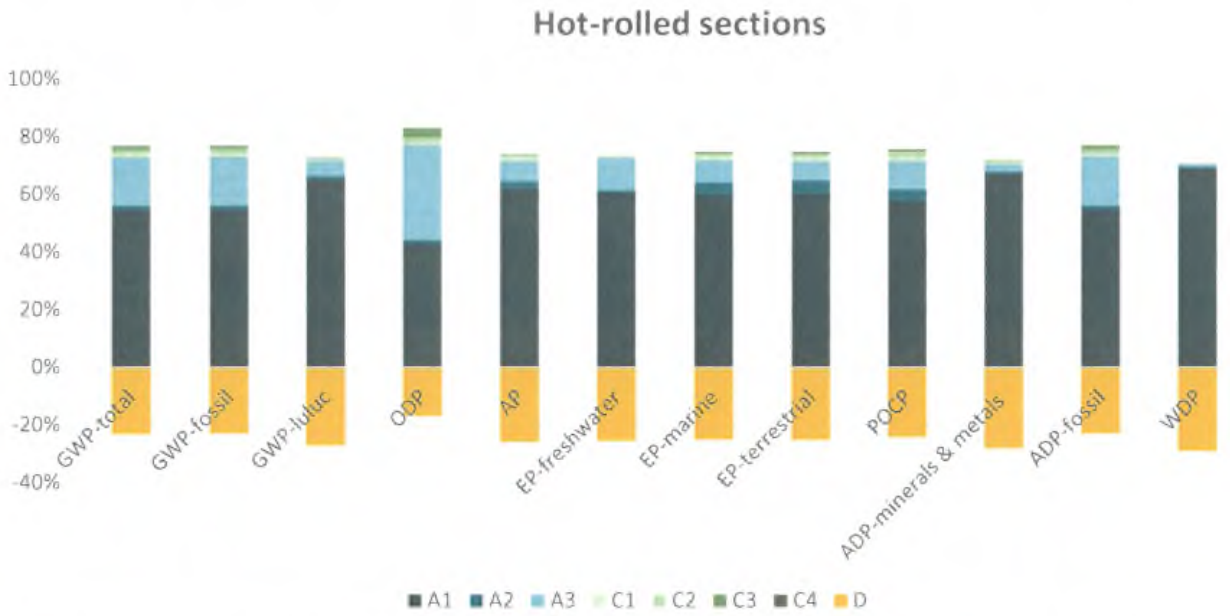


Figure 5. Shares of life cycle modules in the main categories of impacts – hot-rolled sections.

LITERATURE

- ✓ ICIMB-PCR General Product Category Rules for Construction Products.
- ✓ PN-EN 15804+A2:2020-03, Sustainability of building structures - Environmental product declarations -Basic principles of categorization of construction products.
- ✓ PN-EN ISO 14025:2010, Environmental labels and declarations - Type III environmental declarations - Rules and procedures.
- ✓ PN-EN ISO 14040:2009 Environmental management. Life Cycle Assessment. Principles and structure.
- ✓ PN-EN ISO 14044:2009, Environmental management. Life Cycle Assessment. Requirements and guidelines.
- ✓ ISO 21930:2017 – Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products
- ✓ PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
- ✓ KOBiZE CO_2, SO_2, NO_x, CO and total particulate matter emission factors for electricity, December 2023.
- ✓ Act of 14 December 2012 on Waste, Journal of Laws 2013, item 21.
- ✓ Act of 27 April 2001 – Environmental Protection Law, Journal of Laws 2024, item 54.
- ✓ LCA for steel construction https://op.europa.eu.
- ✓ World Steel Association.
- ✓ Data from the company website: **https://www.hutalab.com.pl/.**

Explanatory materials can be obtained by contacting a representative of HUTA ŁABĘDY S.A.