Ravago
BUILDING SOLUTIONS

EPD
THE INTERNATIONAL EPD® SYSTEM

Environmental Product Declaration

IN ACCORDANCE WITH ISO14025:2006 AND EN 15804:2012+A2:2019/AC:2021

STEEL PROFILES AND ACCESSORIES

EPD OF MULTIPLE PRODUCTS BASED ON THE AVERAGE RESULTS OF THE PRODUCT GROUP. THIS EPD COVERS MORE THAN 10 PRODUCTS. A DETAILED LIST OF PRODUCTS CAN BE FOUND IN PAGE 4

EPD REGISTRATION NUMBER	PUBLICATION DATE	DATE OF VALIDITY	PROGRAM	PROGRAM OPERATOR	CPC
S-P-11051	2023-12-11	2028-12-11	THE INTERNATIONAL EPD® SYSTEM www.environdec.com	EPD INTERNATIONAL AB	412: PRODUCTS OF IRON AND STEEL

Ravago Hellas S.M.S.A.

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Program Information

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

Product Category Rules (PCR):

- CEN Standard EN 15804 serves as the Core Product Category Rules (PCR)
- PCR 2019:14 Construction products version 1.3.1 (EN 15804:A2)

Pcr Review Was Conducted by:

- The technical Committee of the International EPD ® System. See www.environdec.com/TC for a list of members.
Chair: No Chair Appointed
Contacte via **info@environdec.com**

LCA accountability:

SUST CHEM SustChem Technical Consulting S.A.
www.sustchem.gr

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

BQ EPD verification by accredited certification body

Third-party verification:

Business Quality Verification P.C is an approved certification body accountable for the third-party verification
www.bqv.gr - info@bqv.gr

The certification body is accredited by:

Hellenic Accreditation System ESYD

Procedure for follow-up of data during EPD validity involves third party verifier:

✓Yes
No

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company Information

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Ravago Hellas S.M.S.A.

Ravago Hellas S.M.S.A. (ex Polykem S.A.) was founded in 1984 and at the time, with only 5 employees, having as main business objective the distribution of DOW's Styrofoam. Throughout the years, **Ravago Hellas S.M.S.A.** (ex Polykem S.A.) expanded its product mix and managed to become one of the major players in the Greek building materials sector. **RAVAGO HELLAS BUILDING SOLUTIONS S.A.,** with remarkable and long-lasting presence in the Greek market, offers specialized building and construction products and solutions for all phases of construction and renovation. In 2017 Ravago acquired all Dow's XPS production plants in Europe, including the one in Lavrion, Greece, aiming to further strengthen Ravago Building Solutions. On April 2018 Ravago acquired **Diamorfotiki SA & Diamorfotiki Viotias SA** and in the end of the same year Diamorfotiki SA merged with Ravago Hellas. This move expands its activities, producing drywall & ceiling metal profiles and accessories through the largest and up to date production unit in Greece situated in Kokkinoxoma Viotias. Ravago Hellas continues its successful course always aiming to best serve the market. **RAVAGO HELLAS BUILDING SOLUTIONS S.M.S.A.** has specialized technical staff and, in combination with the extensive partners network, is able to cover every need in the field of building, renovation and construction improvement of buildings and facilities.

- Proximity to local customer base
- Single point of delivery & invoicing for suppliers / business partners
- Logistics coverage with warehouses & transport
- Resilient business model – diversified activities
- Privately owned and long-term oriented company
- Integrated in Ravago Group shared service
- Transparent communication
- Cost discipline & risk control
- Manufacturing excellence

Product information

This Environmental Product Declaration (EPD) primarily aims to convey the environmental impacts linked to the manufacturing of **Steel Profiles and Accessories** offered by **Ravago Hellas S.M.S.A.**

A CONCISE OVERVIEW AND DESCRIPTION OF RAVAGO'S STEEL PROFILES & ACCESSORIES

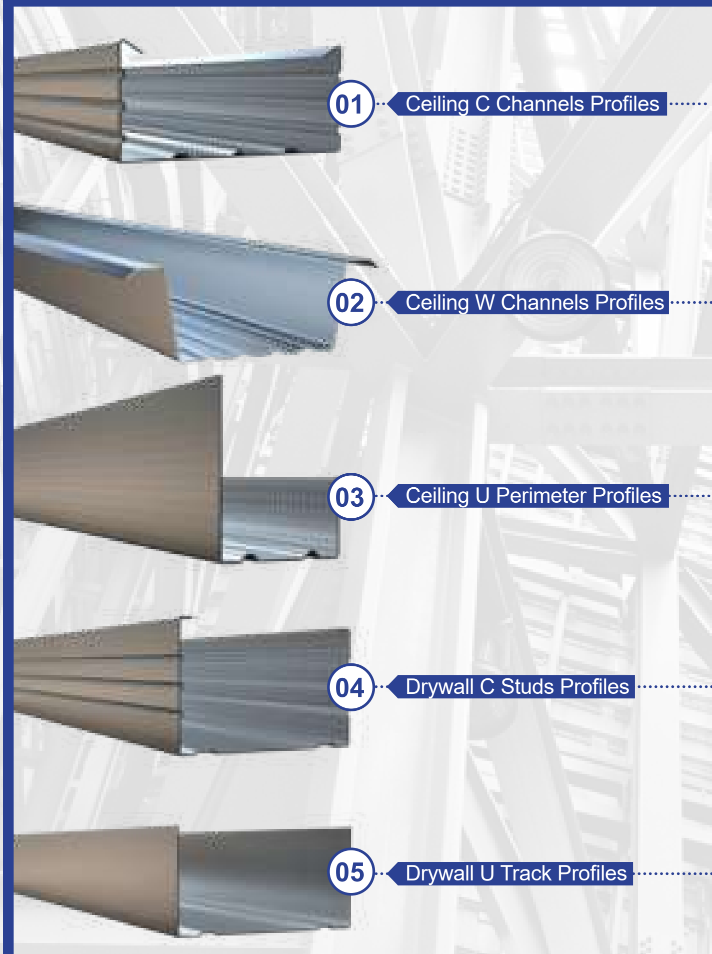
The products covered by this EPD included a wide range of drywall steel profiles and accessories under the commercial names **RAVAGO PROFILES, SUPER STEEL PROFILES, FINE STEEL PROFILES** and **SUPER STEEL ACCESSORIES,** that are designed for multiple applications, including structural support in construction, framing for dry mortarless construction systems (plaster-boards, gypsum-boards, cement-boards, magnesium-boards, etc.), architectural elements, and various industrial and commercial uses. Ravago manufactures Steel Profiles and accessories for drywall systems that adhere to the most rigorous standards, including EN 14195, EN 14353, and DIN 18182. The production process follows the ISO 9001:2015 & ISO 14001:2015 quality systems. These products are renowned for their outstanding technical features and innovative design. Ravago steel profiles & accessories are designed for use in all EU & BS drylining systems. The steel utilized in the production of steel profiles & accessories contains **24% recycled material.**

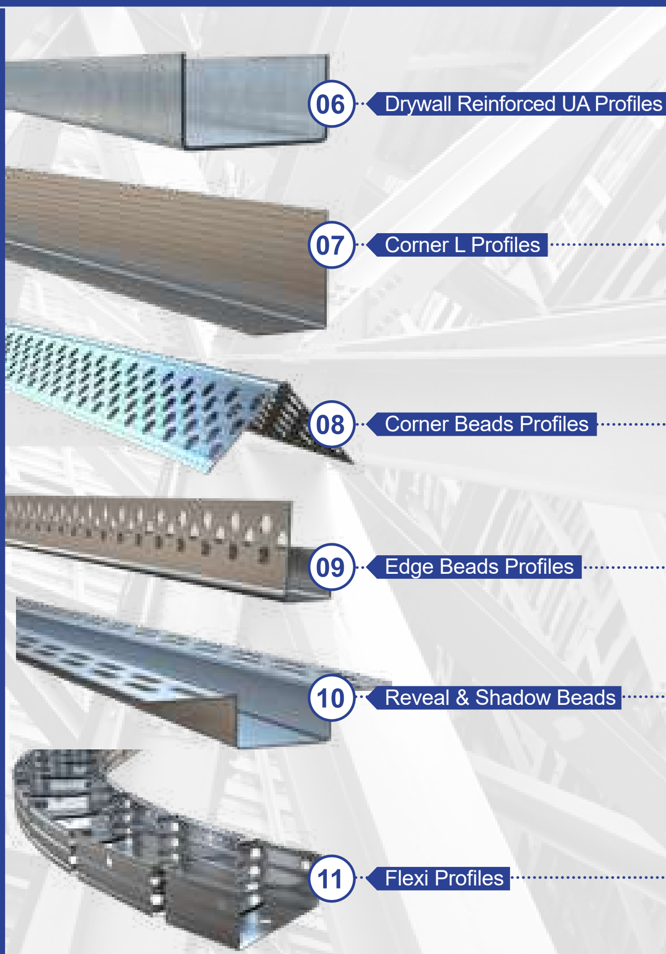
Ravago Profiles

TECHNICAL CHARACTERISTICS

Reaction To Fire ➡ A1

Flexural Tensile Strength ➡ 140 N/mm^2





Accessories

CONTENT INFORMATION

CONTENT DECLARATION OF STEEL PROFILES & ACCESSORIES EXPRESSED IN KG PER D.U. (KG/TN)			
Product Components	**Weight Kg/Tn**	**Post - Consumer Recycled Material (%)**	**Biogenic Material, Weight- % And Kg C/Tn**
Galvanized Steel	1000	24%	0
TOTAL	**1000**	**24%**	**0**
Packaging Materials	**Weight Kg/Tn**	**Weight (%) Versus The Product**	**Weight, Biogenic Carbon, Kg C/Tn**
Cardboard (boxes)	0.1200	0.0120%	9.818E-01
Polyethylene (strips)	0.0152	0.0015%	0
Galvanized steel (strips)	0.3600	0.0360%	0
Wood (pallets & boxes)	0.2401	0.0240%	0.0046
Polypropylene (strips)	0.0385	0.0039%	0
Polyvinyl Chloride – PVC (strips)	0.2652	0.0265%	0
TOTAL	**1.0390**	**0.1039%**	**0.9864**
Carbon Electricity Intensity			
Environmental Effects		Greek Mix* - CO2 Emissions (kgCO2/kWh)	
0.627			

** In accordance with section 1.4 of PCR 2019: 14 "Construction Products" version 1.3.1, it is required to disclose the climate impact (measured in kilograms of CO2 eq. per kilowatt-hour (kWh) using the GWP-GHG indicator) associated with the electricity acquisition during the manufacturing process in A3*

NO SUBSTANCES INCLUDED IN THE CANDIDATE LIST OF SUBSTANCES OF VERY HIGH CONCERN FOR AUTHORIZATION UNDER THE REACH REGULATIONS THAT EXCEED 0.1% OF THE TOTAL WEIGHT ARE PRESENT IN THE EXAMINED SYSTEMS.

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LCA INFORMATION

SYSTEM BOUNDARIES	DECLARED UNIT	TIME REPRESENTATIVENESS	GEOGRAPHICAL SCOPE	DATABASES USED	SOFTWARE USED
This LCA study follows a “cradle-to-gate” approach with modules C1-C4 & module D.	The declared unit used in this EPD is one (1) ton (tn) of Steel Profiles & Accessories, referring to an average product.	The data used for the analysis are based on one-year average production data, from January 2022 to December 2022.	Global	Ecoinvent 3.8.1 & Professional 2021	LCA for experts (GaBi)

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				RESOURCE RECOVERY STAGE
	RAW MATERIAL	TRANSPORT	MANUFACTURING	TRANSPORT	CONSTRUCTION INSTALLATION	USE	MAINTENANCE	REPAIR	REPLACEMENT	REFURBISHMENT	OPERATIONAL ENERGY USE	OPERATIONAL WATER USE	DECONSTRUCTION, DEMOLITION	TRANSPORT	WASTE PROCESSING	DISPOSAL	REUSE, RECOVERY, RECYCLING POTENTIALS
MODULE	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MODULES DECLARED	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
GEOGRAPHY	GLO	GLO	GR	-	-	-	-	-	-	-	-	-	EU-27	EU-27	EU-27	EU-27	EU-27
SPECIFIC DATA USED		>90%															
VARIATION – PRODUCTS		0%*															
VARIATION – SITES		0%															

** Due to consistency of inputs irrespective of examined products*

X: Module Declared / ND: Not Declared

Ravago BUILDING SOLUTIONS

Description Of Examined Modules

As depicted in the preceding diagram, the study encompasses specific Life Cycle stages: production, end-of-life, and resource-recovery. Information modules that have been excluded (construction and use stages) are scenario-driven. The primary objective of this EPD is to convey the environmental aspects related to the actual data that the company can control during the manufacturing of steel profiles & accessories.

Product Stage

MODULES A1-A3

In these aggregated modules (Modules A1-A3), the entire lifecycle of raw materials and packaging materials, including their production, transportation to Ravago's facilities, and associated utilities like electricity usage, are considered. Specifically, Module A1 covers the production of primary and secondary galvanized steel, examining every step from ore extraction to steel profile creation. Module A2 addresses the transportation of various packaging materials such as cardboard boxes, different material strips (galvanized, polyethylene, polypropylene, polyvinyl chloride), wooden boxes, pallets, and iron staples and raw materials to the company's facilities. Lastly, Module A3 encompasses the production of imported electricity from the Greek grid.

The primary processes involved in the production process are represented in the below flow-chart:

STEEL PROFILES & ACCESSORIES PRODUCTION

End-Of-Life Stage

The end-of-life stage of the construction product starts when it is replaced, dismantled, or deconstructed from the building or construction works and does not provide any further functionality. Alternatively, this phase may commence when the building itself reaches its end-of-life, depending on the chosen end-of-life scenario for the product. In this study, we adopt the perspective that the end-of-life phase for steel profiles and accessories begins when the building itself is deconstructed or demolished, as they cannot be detached from the building's construction once they are installed.

Regarding the various end-of-life scenarios, we rely on the estimates provided by the World Steel Association for the construction industry, indicating that a minimum of 85% of steel waste is directed towards recycling, with the remaining 15% being disposed of alongside the polyisocyanurate foam. Given the uncertainty surrounding the specific disposal methods employed, we have taken a reasonable approach, considering landfilling as the sole disposal scenario.

PROCESSES	KG/TN
COLLECTION PROCESS SPECIFIED BY TYPE	1000 KG COLLECTED WITH MIXED CONSTRUCTION WASTE 850 KG SORTING AND PRESSING FOR RECYCLING
RECOVERY SYSTEM SPECIFIED BY TYPE	850 KG FOR RECYCLING
DISPOSAL SPECIFIED BY TYPE	150 KG FOR LANDFILLING
ASSUMPTIONS FOR SCENARIO DEVELOPMENT (TRANSPORTATION)	DISTANCE OF WASTE HANDLING FACILITIES: 100KM

Description Of Examined Modules

End-Of-Life Stage

MODULE C1
In Module C1, emissions related to the deconstruction of the product from the building are accounted. For the purposes of this study, a plausible scenario was developed, based on literature research. Deconstruction of steel profiles and accessories is assumed to be performed mechanically, and thus, an excavator (diesel, 100kW) is used.

MODULE C3
Module C3 encompasses the pre-recycling processing stage, which involves separating a portion of the waste steel profiles and accessories from the overall deconstruction waste. According to a study conducted by the World Steel Association, 85% of the steel utilized in the global construction sector is reclaimed through recycling.

MODULE C2
In this module, the transportation of deconstructed steel profiles and accessories to the waste treatment facilities is considered. Assumptions are made for the mean distance of construction sites from waste handling facilities and the means of transportation.

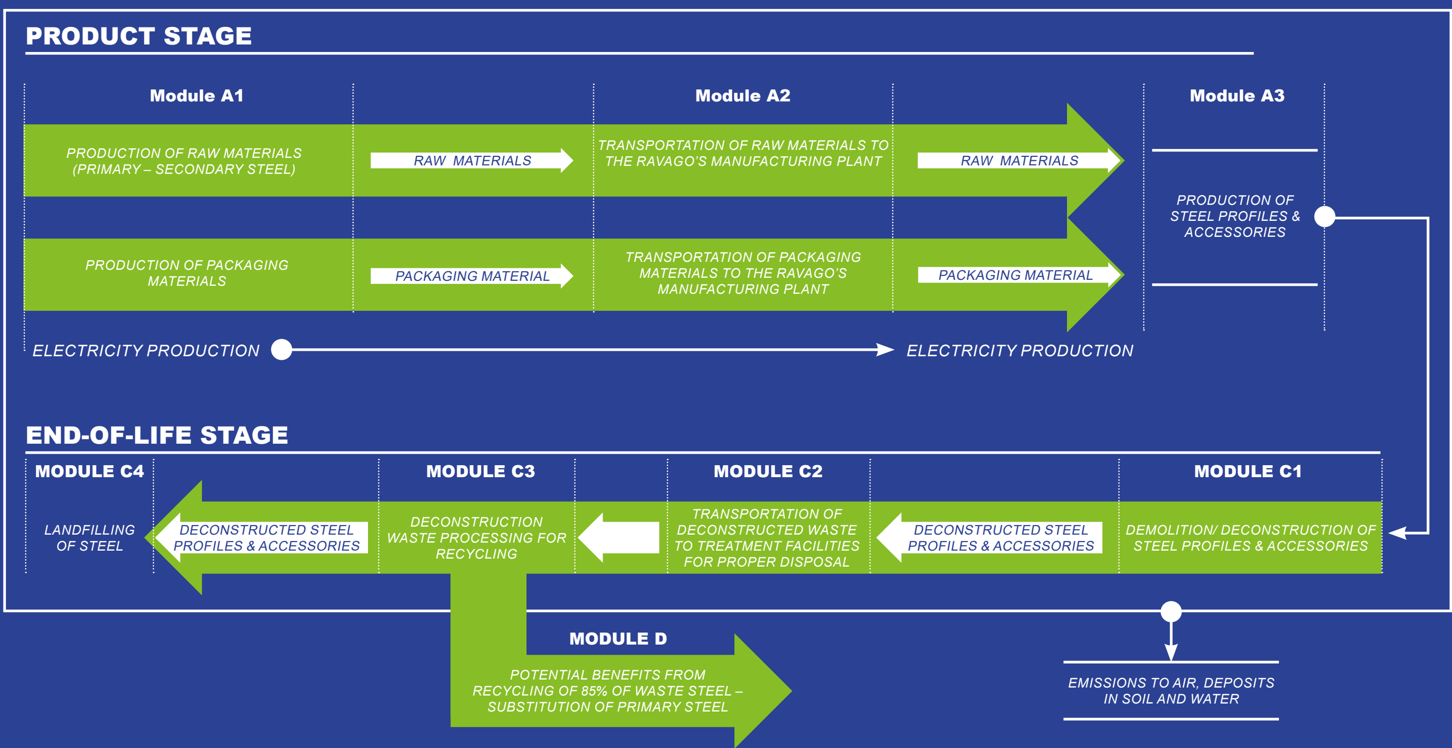
MODULE C4
Within this Module, the emissions related to the disposal of the 15% of waste steel were examined . Given the inherent uncertainty regarding the actual disposal method selected, the most plausible and reasonable scenario was adopted , with considering landfilling as being the disposal method.

Disclaimer: *Considering that Module C is included in this EPD, is discouraged to use the results of modules A1-A3 without considering the results of module C.*

Resource / Recovery Stage

MODULE D
In this module, the net benefits associated with the recycling of waste steel are declared.

System Diagram



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Additional LCA Information

Assumptions

- Assumptions were employed when selecting the modes of transportation for both road and marine routes, taking into account factors such as technology, fuel type, and payload capacity. An average mode of transportation was chosen for each route to offer a reasonable approximation for all transported goods.
  - ***For road transportation:*** It is assumed that a diesel-powered truck with Euro 6 emissions standards, a gross weight of 12-14 tons, and a payload capacity of 9.3 tons is used.
  - ***For marine transportation:*** The employed vessel is assumed to be a diesel driven, average vessel of 3,500 t payload capacity.
- An assumption was established regarding the timing and method used for disassembling steel profiles & accessories. The end-of-life phase for steel profiles and accessories is determined to coincide with the demolition of the building. The deconstruction process is executed through mechanical means, employing a diesel-powered excavator with a power rating of 100 kW.
- Assumptions regarding the end-of-life of deconstructed steel waste is used. More specifically, based on the World Steel Association's recycling rate estimations, it is assumed that 85% of the steel scrap occurred from the building's demolition (module C1) are recovered and recycled, and thus, the remaining 15% is driven to landfill.
- Ravago's suppliers furnishes steel containing at least 30% recycled content, with a substantial portion (80%) being sourced from post-consumer sources. As a precautionary measure, a 30% recycled steel was considered as the most conservative estimate.
- An assumption regarding the proximity of waste treatment facilities to construction sites was made. Namely, it was assumed that the treatment facilities would be located within a distance of 100 kilometers from the construction sites.

Allocations

- Given that, electricity usage is documented for the entire facility, and to distribute this consumption across each product, a mass-based allocation method was employed. Additionally, the overall electricity consumed during the reported period is allocated to the products of interest (i.e., profiles and accessories). A third stream, concerning production of drywall access panels takes place inside the facility, yet it involves only assembly of access panels, and no electricity is required.
- The volume of packaging materials used for final products, was mass allocated to the total production of steel profiles and accessories.

Cut-Offs

- The total of neglected input flows per module, e.g. per module A1-A3, C1-C4 and module D shall be a maximum of 5 % of energy usage and mass. These rules were followed in order to evaluate the impact of inventory flows inclusion or exclusion, respectively. All major raw materials, elements and all the essential energy required are included within the system boundaries. Data for elementary flows to and from the product system contributing to minimum of 99% of the declared environmental impacts are included in the study. The sole processes omitted from this study are:
- Production of certain packaging materials, which were determined to be considerably less than 5% of the specified unit mass (wooden beams, pocket clips, stretch film and acrylic PPA adhesive tapes and solvent ink).
- Waste management of mixed and galvanized waste resulting from the production of steel profiles & accessories.
- The handling of wooden-based waste from the packaging materials associated with final products during the installation phase, is not considered within the system boundaries.
- Wooden-based pallets management is not included in this discussion since these pallets are designed for reuse

Environmental Performance Indicators

RAVAGO STEEL PROFILES & ACCESSORIES

POTENTIAL ENVIRONMENTAL IMPACTS/ 1 TN AVERAGE STEEL PROFILES & ACCESSORIES

CORE ENVIRONMENTAL IMPACT INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Global Warming Potential – total	GWP-total	kg CO2 eq.	2.167E+03	6.461E-01	1.218E+01	2.899E+01	7.333E+00	-1.109E+03
Global Warming Potential – fossil	GWP-fossil	kg CO2 eq.	2.166E+03	6.410E-01	1.208E+01	2.894E+01	7.325E+00	-1.109E+03
Global Warming Potential – biogenic[3]	GWP-biogenic	kg CO2 eq.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Global Warming Potential – land use and land use change	GWP-luluc	kg CO2 eq.	1.046E+00	5.057E-03	9.908E-02	5.415E-02	7.331E-03	3.223E-01
Global Warming Potential – GHG[1]	GWP-GHG	kg CO2 eq.	2.167E+03	6.461E-01	1.218E+01	2.899E+01	7.333E+00	-1.109E+03
Ozone Depletion Potential	ODP	kg CFC 11 eq.	6.263E-06	7.889E-17	1.546E-15	3.366E-06	1.730E-14	1.583E-05
Acidification Potential	AP	Mole of H+ eq.	6.355E+00	3.045E-03	1.182E-02	3.151E-01	2.333E-02	-1.702E+00
Eutrophication Potential – freshwater	EP-freshwater	kg P eq.	4.350E-02	1.833E-06	3.592E-05	1.517E-02	5.575E-06	-5.395E-06
Eutrophication Potential – marine	EP-marine	kg N eq.	1.335E-01	1.432E-03	3.691E-03	7.150E-02	5.791E-03	-5.393E-01
Eutrophication Potential – terrestrial	EP-terrestrial	kg N eq.	1.490E+00	1.585E-02	4.454E-02	8.008E-01	6.354E-02	-2.355E+00
Photochemical Oxidant Formation Potential	POCP	kg NMVOC eq.	1.723E+01	4.026E-03	1.014E-02	2.205E-01	1.825E-02	-1.718E+00
Abiotic Depletion Potential – elements[2]	ADPe	kg Sb eq.	5.023E+00	4.701E-08	9.211E-07	2.962E-03	5.055E-07	-5.065E-03
Abiotic Depletion Potential. fossil resources[2]	ADPf	MJ net calorific value	1.153E-02	8.220E+00	1.611E+02	3.975E+02	1.067E+02	-9.177E+03
Water Deprivation Potential[2]	WDP	m3 world eq. deprived	2.264E+04	5.362E-03	1.051E-01	6.700E+00	-8.682E-02	-5.566E+02

1 ➡ This 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 CO2 is set to zero

2 ➡ 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.

3 ➡ Actually, this indicator is negative due to an uptake of biogenic carbon in packaging materials. Considering that module A5 is not declared, the correlated emissions due to end-of-life of packaging, are balanced-out already in Module A1-A3, hence resulting in a total value of zero.

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Environmental Performance Indicators

RAVAGO STEEL PROFILES & ACCESSORIES

POTENTIAL ENVIRONMENTAL IMPACTS/ 1 TN AVERAGE STEEL PROFILES & ACCESSORIES

RESOURCE USE INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ. net calorific value	1.387E+03	4.587E-01	8.988E+00	4.881E+01	7.704E+00	1.223E+03
Use of renewable primary energy resources used as raw materials	PERM	MJ. net calorific value	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total use of renewable primary energy resources	PERT	MJ. net calorific value	1.387E+03	4.587E-01	8.988E+00	4.881E+01	7.704E+00	1.223E+03
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ. net calorific value	2.264E+04	8.231E+00	1.613E+02	3.978E+02	1.067E+02	-9.174E+03
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ. net calorific value	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total use of non-renewable primary energy resources	PENRT	MJ. net calorific value	2.264E+04	8.231E+00	1.613E+02	3.978E+02	1.067E+02	-9.174E+03
Use of secondary material	SM	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Use of renewable secondary fuels	RSF	MJ. net calorific value	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Use of non-renewable secondary fuels	NRSF	MJ. net calorific value	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Use of net fresh water	FW	m3	2.601E+01	5.251E-04	1.029E-02	1.560E-01	1.102E-03	-1.285E+01

Environmental Performance Indicators

RAVAGO STEEL PROFILES & ACCESSORIES

POTENTIAL ENVIRONMENTAL IMPACTS/ 1 TN AVERAGE STEEL PROFILES & ACCESSORIES

WASTE INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	1.330E-05	4.148E-10	8.13E-06	0.000E+00	1.89E-05	-9.46E-03
Non-hazardous waste disposed	NHWD	kg	6.865E+01	1.223E-03	2.40E+01	0.000E+00	1.50E+05	-5.48E+04
Radioactive waste disposed	RWD	kg	7.191E-02	9.956E-06	1.95E-01	0.000E+00	1.22E+00	1.76E+02
OUTPUT FLOWS		**UNIT**						
Components for re-use	CRU	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Material for recycling	MFR	kg	0.000E+00	0.000E+00	0.000E+00	8.50E+05	0.000E+00	0.000E+00
Materials for energy recovery	MER	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Exported energy	EE	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS		**UNIT**						
Particulate matter emissions	PM	Disease incidence	8.091E-05	3.446E-08	7.085E-08	4.152E-06	2.530E-07	-2.449E-05
Ionizing radiation human[4]	IRP	kBq U235 eq.	4.591E+01	1.425E-03	2.793E-02	2.012E+00	1.744E-01	3.307E+01
Eco-toxicity. Freshwater[2]	ETP-fw	CTUe	6.181E+03	5.941E+00	1.164E+02	1.497E+03	3.138E+01	4.347E+03
Human toxicity. cancer effects[2]	HTP-c	CTUh	1.380E-06	1.199E-10	2.349E-09	4.511E-08	3.642E-09	2.135E-07
Human toxicity. non-cancer effects[2]	HTP-nc	CTUh	3.396E-05	7.209E-09	1.215E-07	1.902E-06	3.661E-07	-8.711E-06
Land use related impacts/Soil quality[2]	SQP	dimensionless	1.777E+03	2.823E+00	5.531E+01	6.635E+02	7.853E+00	1.214E+03

2 ➡ 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.
4 ➡ 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

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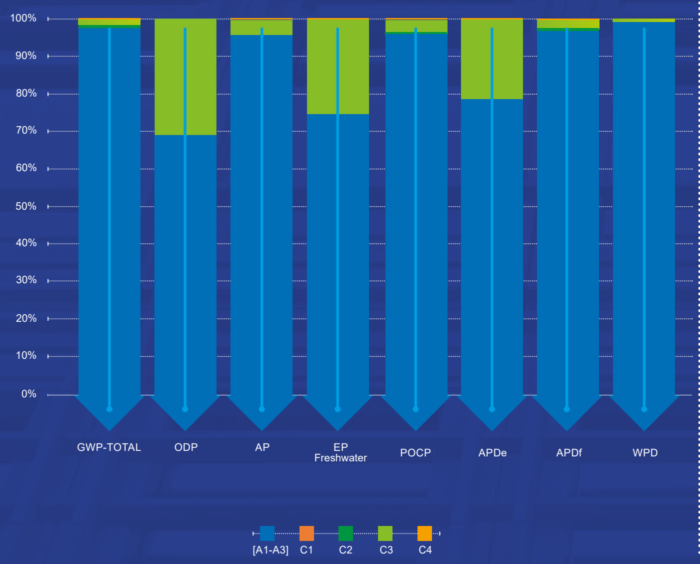
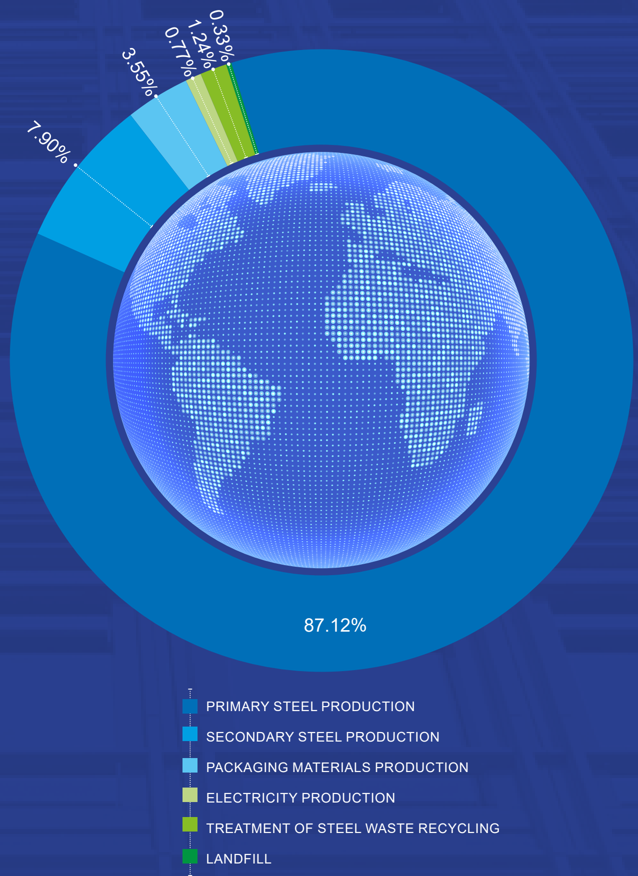
Interpretation

- The following diagram illustrates the respective contributions of the assessed modules (A1-A3 & C1-C4) to the fundamental environmental impact indicators. The evaluation of the outcomes took the form of a dominance analysis focused on these key environmental impacts. Evidently, the modules A1-A3 exert a predominant influence on the majority of the scrutinized impact categories
- Concerning the assessment of Global Warming Potential (GWP), it is observed that the most influential phases in the life cycle are modules A1-A3, which collectively contribute to 98.84% of the total impact. These modules encapsulate a significant portion of environmental considerations. Following these, Modules C3, C2, and C4 also play roles in GWP, albeit to a lesser extent, accounting for 0.59%, 0.36%, and 0.20%, respectively. This breakdown illustrates the hierarchy of contributions to GWP throughout the various phases of the product's life cycle.

% LIFE CYCLE MODULES CONTRIBUTION



% Process Contribution To Global Warming Potential - Total



The largest share of the total Global Warming Potential (GWP) is linked to the extraction and manufacturing of raw materials, with a particular emphasis on primary and secondary steel production. This is clearly illustrated in the chart on the left side of the presentation, contributing to nearly 95% of the overall GWP-total.

Disclaimer: 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.

References

- International EPD® System, PCR 2019:14 Construction Products, version 1.3.1
- EN 15804:2012+A2:2019/AC 2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- International EPD® System, General Program Instructions for the International EPD System, version 4.01
- ISO 14020:2000 – Environmental Labels and Declarations – General Principles
- ISO 14025:2006 - Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 14040:2006 - Environmental management – Life Cycle assessment – Principles and framework
- ISO 14044:2006 - Environmental management – Life Cycle assessment – Requirements and guidelines
- The International EPD® System – The International EPD System is a programme for type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. **EPD International.html**
- Sphera – GaBi Product Sustainability software – **www.sphera.com**
- Ecoinvent/ Ecoinvent Centre – Home - **ecoinvent.html**
- Fact Sheets - World Steel Association: "Steel and raw materials" – **Fact sheets - worldsteel.org.html**

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