38/71 Eagle Street Brisbane City QLD, 4000 Australia

Global GreenTag
International EPD Program

EPD™
Environmental Product Declaration
In accordance with ISO 14025 and EN 158042

ECO PLATFORM

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Jiangyin Jianhe Steel Co. Ltd

Structural steel hollow sections and structural built ups

Company Address: NO.7 Xinyang Road, Xinqiao, Jiangyin, Jiangsu, China
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1 General Information

Product Category Rules (PCR)	CEN standard EN 15804+A2 2019 serves as core Product Category Rules (PCR) (07 2022) (1)			
Sub-PCR	Structural Steel Sub-PCR STS:2024 V1			
Verification Statement	Independent verification of the declaration and data, according to ISO 14025:2010 ☐Internal ☒ External Independent external verification of the declaration and data, mandatory for business-to-consumer communication according to ISO 14025:2010			
	Signature	**Name**	**Details**	**Logo**
Third Party Verifier		Ankang	CECEP Eco-Product Development Research Center Room 1607, 16th Floor, No. 42, Xizhimen North Street, Haidian District, Beijing, China LCA_contact_ak@yeah.net https://www.cecep.cn/	
LCA and EPD Producer		**ERKE Sustainability Consultancy**	Kısıklı Mah. Hanımseti Sok. No:5 Üsküdar/İstanbul/Türkiye info@erkeconsultancy.com www.erkeconsultancy.com	ERKE 'Delivering Sustainable Buildings'
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EPD Owner	2025/07/09	Xiaohong Liu	Jiangyin Jianhe Steel Co.Ltd NO.7 Xinyang Road, Xinqiao, Jiangyin, Jiangsu, China +86-139-13611332	Jian He 建禾钢品
Communication	This EPD can be used for business-to-consumer (B2C) communication.			
Comparability	EPD of construction products may not be comparable if they do not comply with EN 15804			
Geographical Area	The product is produced in Jiangyin, Jiangsu, China, the market place is worldwide.			
Life Cycle Assessment (LCA)-method Cut-off Classification	Complies with EN 15804+A2:2019			
Characterisation Factors Version	EF Reference Package 3.1			
Electricity mix	Consumption mix			

2 Product Information – Product Specific EPD

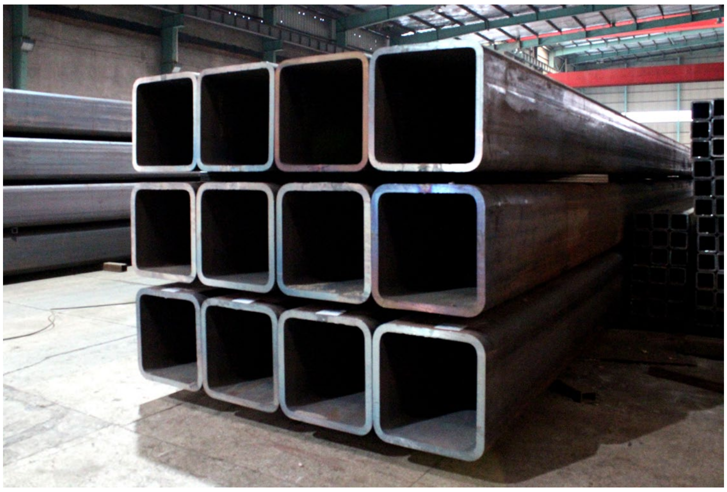


Figure 1 Structural steel hollow sections

Figure 2 Structural steel built ups

EPD Data Type	This EPD is based on product specific information.	
Product Name 1	Structural steel hollow sections	
Product Description 1	Steel hollow sections (e.g., circular, rectangular, or square tubes) are characterized by their closed, hollow cross-sections. Their functional range includes: - Structural Efficiency: High strength-to-weight ratio, ideal for lightweight yet robust frameworks in construction (e.g., roofing, bridges, and trusses). - Torsional Resistance: Superior performance under twisting forces, suitable for space frames, cantilevered structures, and machinery. - Aesthetic Flexibility: Smooth, continuous profiles are favored in architectural applications (e.g., exposed façades, modern staircases, and sculptural elements). - Utility Integration: Hollow cores allow routing of electrical, plumbing, or HVAC systems in buildings. - Modularity: Prefabricated uniformity supports rapid assembly in modular construction and scaffolding.	
Product Name 2	Structural steel built ups	
Product Description 2	Built-up sections are custom-engineered by combining standard steel components (e.g., plates, I-beams, channels) via welding or bolting. Their functional range includes: - Heavy Load Capacity: Tailored to bear extreme loads in large-span structures (e.g., crane girders, industrial warehouses, and bridge girders). - Design Customization: Adaptability to unique geometric or load requirements, such as irregular column shapes or seismic-resistant frames. - Composite Applications: Integration with concrete or other materials for hybrid systems (e.g., high-rise cores, composite beams). - Cost-Effective Scalability: Optimized material use for large-scale projects (e.g., transmission towers, wind turbine bases, and shipbuilding). - Ductility and Resilience: Enhanced energy absorption in dynamic or seismic environments, critical for infrastructure in hazard-prone regions.	
Production Site	Jiangyin, Jiangsu, China	
Product Performance and	**Standard**	**Result**
	EN10219, EN10210	Available on request
	BS1387, JISG3466, DIN2240	

Standard Compliance	ASTM A500, ASTM A501, AS1163		
Product Grade	Chinese grade: ● Q235GJB/C/D ● Q345GJC/D/E,Q345B & Q345GJB ● Q390GJC/D/E ● Q420GJC/D/E ● Q460GJE/D/E Japanese grade: ● SS490 and SS400 American grade： ● A500 Grade A/B/C/D ● A501 Grade A/B/C/D Australia grade： ● C350LO/C450LO	EN grade: ● S235JRH/JOH/J2H ● S275JRH/JOH/J2H,S275NH ● S355JRH/JOH/J2H,S355NH ● S420JOH ● S460NH/S460JOH	
Candidate List of Substances of Very High Concern for Authorisation	Product does not contain substances on the “Candidate List of Substances of Very High Concern for authorisation” (2) that require registration.		
Materials	**Material**	**Function**	
	Hot rolled coils	Structure	
	Hot rolled plates	Structure	
	Welding wire	Welding	
	Welding flux	Welding	
	Steel belt	Packaging	
Content declaration	Elements	Total mass percentage(%)	CAS Number
	Fe	>95.0	7439-89-6
	Al	⩽0.1	7429-90-5
	Cu	⩽0.6	7440-50-8
	Mn	⩽1.8	7439-96-5
	Si	⩽2.0	7440-21-3

3 LCA Description and Rules

EPD Type	Cradle-to-gate (A1-A3) with modules C1-C4 and module D See Figure 2: Modules Included
Functional/Declared Unit	The declared unit is production of 1 tonne Structural steel hollow sections or Structural built ups (mass excluding packaging).
8Reference Service Life (RSL)	According to the producer, reference service life is not available.
Application of Cut-Off Criteria	According to PCR, the definition of cut-off criteria allows some data from the inventory to be disregarded when such data is considered irrelevant for the purposes of the study and would only represent an unnecessary burden in collecting data, without significantly altering the end result. Except for the exclusions listed in the PCR, no other specific cut-off criteria is applied. In this study, all the input and output are included, no cut-off applied.
Allocations	<u>Allocation of input</u> Allocation of input is based on physical properties and is based on weight. <u>Allocation of co-products</u> According to PCR, The steel scrap originating from Module A1-A3 should be considered as co-product to be removed from the product system through co-product allocation. In this study, the amount of scrap iron is only 0.008% of the finished product, so it is directy ignored. <u>Allocation of waste</u> The allocation strategy for the waste per PCR follows the same strategy listed in the EN15804+A2. Thus, the “cut-off” strategy is applied. This scenario allocates the entire environmental impacts of waste treatment procedures (from deconstruction to the waste processing) to the producer. The recycled materials, on the other hand, are burden-free. An important note is that when materials have reached a so-called “end-of-waste” state, the coverage of the waste processing is thus terminated. Any inputs/flows related to refine gross recycled materials for actual applications are beyond the product system boundary.
Data Collection Period	2022.11-2023.11
Applied Software	SimaPro 9.5.0.0
Applied Background Database	Ecoinvent 3.9.1
Data Quality Assessment	See Figure 4 Data quality requirement and assessment
Applied Energy Datasets	Electricity, medium voltage {CN-ECGC} | market for electricity, medium voltage | Cut-off, U
Applied Electricity Mix Carbon Footprint	[0.852 kg CO2e/kWh.]

Figure 3: Modules Included

Information	Construction Works Life Cycle Information																Supplementary Information
Stages	Product			Construction Process		Use							End-of-Life				Benefits & Loads Beyond the System Boundary
Module Codes	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module Names	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water use	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Modules Declared	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓	✓
Data	Based on Primary Information			Scenario													Scenario

✓ = Module Included , MND = Module Not declared

Figure 4: System Process Flow Chart

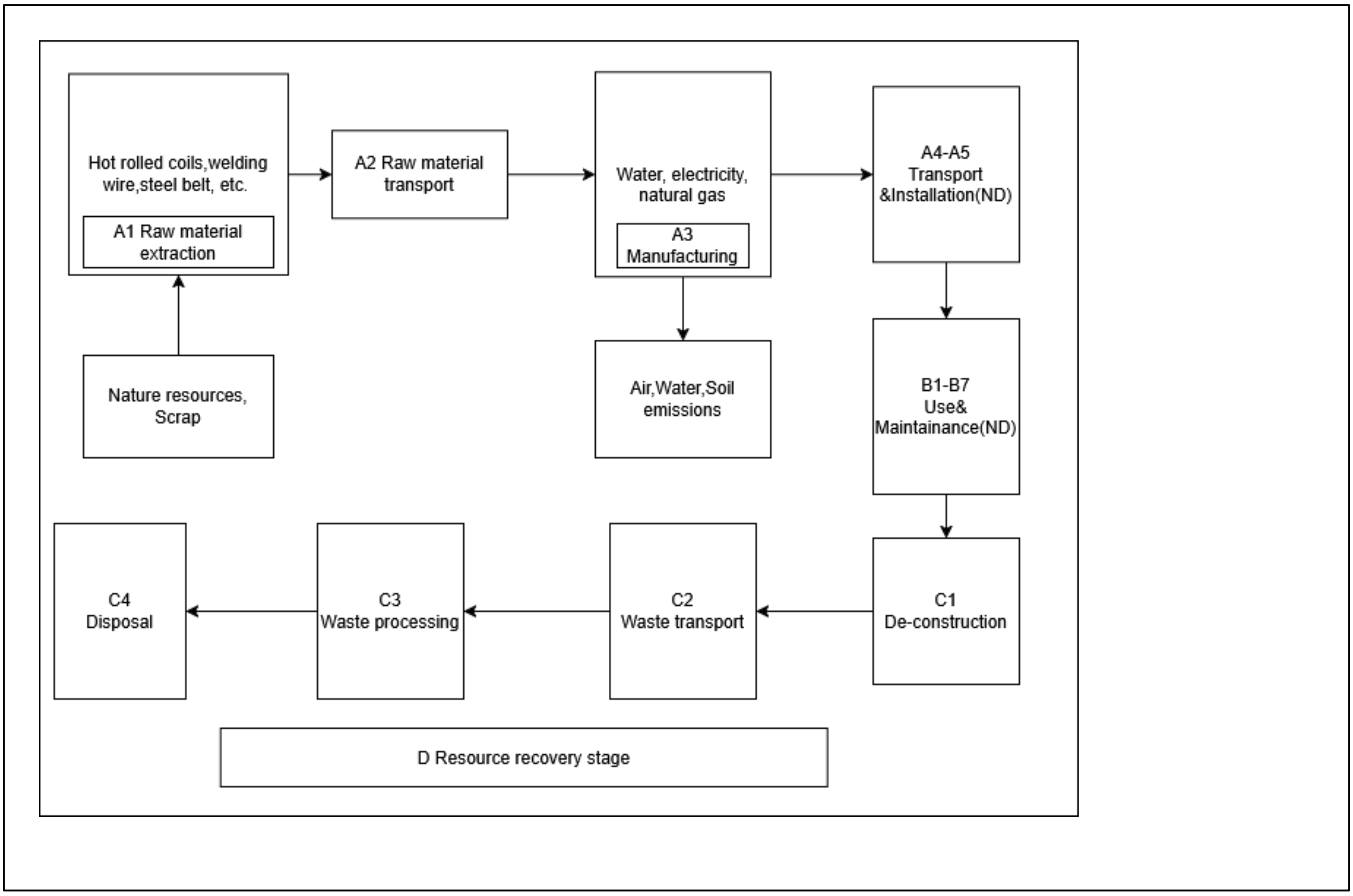
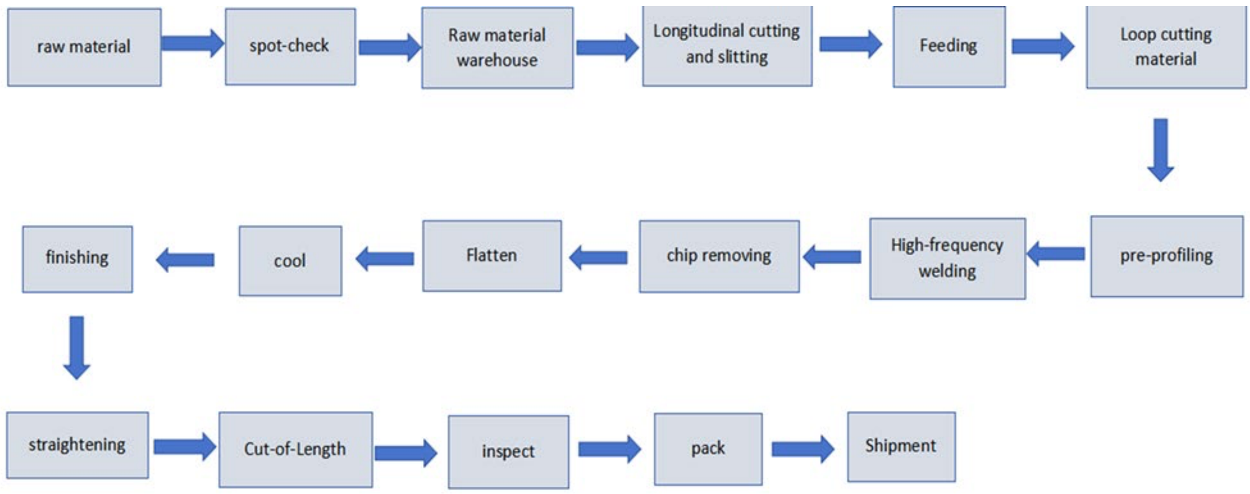
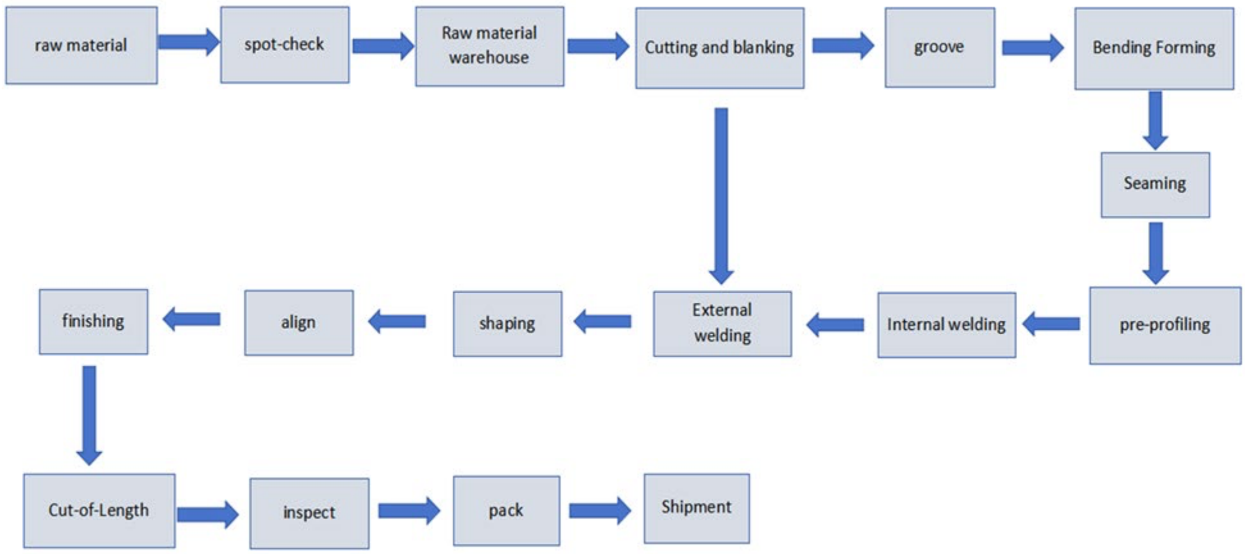


Figure 5: Manufacturing Processes



Structural steel hollow sections manufacturing process



Structural built ups sections manufacturing process

Figure 6: Data quality requirement and assessment

Quality requirement	**Specific requirement**	**Data quality applied in this LCA**	**Result** **Met/not met**
Time-related coverage (age of data and the minimum length of time over which data should be collected)	Generic datasets should be within ten years	Ecoinvent 3.9.1, <10 years	Met
	Newly collected LCI data were current or up to 5 years old and based on a 1-year average	2022.11-2023.11 production inventory	Met
Geographical coverage (the geographical area from which data for unit processes should be collected to satisfy the goal of the study):	Geographic coverage shall reflect the operational reality of the different life cycle stages;	All raw material data was collected from the manufacturer in China; Production data was collected and provided by Jiangyin Jianhe Steel Co.Ltd.	Met

Quality requirement	Specific requirement	Data quality applied in this LCA	Result Met/not met
		EoL stage are based on their respective geographical regions. The specific applied scenarios are supplied by Jiangyin Jianhe Steel Co.Ltd, which is deemed to be representative.	Met
		Transportation and energy use data referring to Ecoinvent data with geographical coverage corresponding to the location.	Met
Technology Coverage	Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative fabrication datasets, specific to the type of material, are used to represent the actual processes, as appropriate.	Met
Precision	Measure of the variability of the data values for each data expressed	Data collected for operations were typically averaged for one or more years over multiple operations, which is expected to reduce the variability of results.	Met
Completeness	95% percentage of flow is measured or estimated	All of the unit processes within the scope of the life cycle were included, with less than a 1% cut-off	Met
Representativeness	Qualitative assessment of the degree to which the data set reflects the actual population of interest, i.e., geographical coverage, period, and technology coverage	See geographical coverage, period, and technology coverage requirement above. These requirements are met.	Met
Consistency	Qualitative assessment of Whether the study methodology is applied uniformly to the various components of the analysis	The study methodology is applied uniformly to the different parts of the analysis.	Met
Reproducibility	Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	Based on the description of data and assumptions used, this assessment would be reproducible by other practitioners. All assumptions, models, and data sources are documents.	Met
Sources of the data	The foreground data should be from the primary producer	Data representing energy use at Chinese factories represent an annual average and are considered of high quality due to the length of time over which these data are collected. For secondary LCI	Met

Quality requirement	Specific requirement	Data quality applied in this LCA	Result Met/not met
		datasets, Ecoinvent v3.9.1 are used.	
Uncertainty of the information	Data, models, and assumptions should be verified	All the primary data and assumptions were confirmed with Jiangyin Jianhe Steel Co.Ltd, and models were built following ISO 14040/44 and PCR requirements.	Met

4 Scenarios and Additional Technical Information

The results have been calculated based on the below information.

Module	Scenario and Additional Technical Information
A1-A3	In A3, after manufacturing, the steel scrap waste is sold to other venders for recycling.
C1	No material and energy use for C1.
C2	For module C2, the assumption has been made that the waste product would be transported for 50 km by truck.
C3	Due to waste going directly to landfill or recycling, there is no need for any waste processing (C3).
C4	For module C4, the 15% of the rest of the waste product would be sent to C4 for landfill, and 85% to recycling according to the worldsteel data (Worldsteel association, 2017).
D	The benefit of steel recycling calculated according to Life cycle assessment methodology report (Worldsteel association, 2017).

5 LCA Results – Definitions and Disclaimers

All results have been calculated and displayed as per EN15804. Units Methods and Anonyms are defined below. Results are reported in scientific notation.

Figure 7:Core Indicators

Impact Category	Indicator	Acronym	Unit
Climate change – total	Global Warming Potential total	GWP-total	kg CO_2 eq.
Climate change - fossil	Global Warming Potential fossil fuels	GWP-fossil	kg CO_2 eq.
Climate change - biogenic	Global Warming Potential biogenic	GWP-biogenic	kg CO_2 eq.
Climate change - land use and land use change	Global Warming Potential land use and land use change	GWP-luluc	kg CO_2 eq.
Ozone Depletion	Depletion potential of the stratospheric ozone layer	ODP	kg CFC 11 eq.
Acidification	Acidification potential, Accumulated Exceedance	AP	mol H^+ eq.
Eutrophication aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment	EP-freshwater	kg PO_4 eq.
Eutrophication aquatic marine	Eutrophication potential, fraction of nutrients reaching freshwater end compartment	EP-marine	kg N eq.
Eutrophication terrestrial	Eutrophication potential, Accumulated Exceedance	EP-terrestrial	mol N eq.
Photochemical ozone formation	Formation potential of tropospheric ozone	POCP	kg NMVOC eq.
Depletion of abiotic resources – minerals and metals[2]	Abiotic depletion potential for non-fossil resources	ADP-minerals&metals	kg Sb eq.
Depletion of abiotic resources - fossil fuels[2]	Abiotic depletion potential for fossil resources	ADP-fossil	MJ, net calorific value
Water use[2]	Water (user) deprivation potential, deprivation- weighted water consumption	WDP	m^3 world eq. deprived

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Figure 8: Additional Indicators

Impact category	Indicator	Acronym	Unit
Particulate matter emissions	Potential incidence of disease due to PM emissions	PM	Disease incidence
Ionising radiation, human health[1]	Potential Human exposure efficiency relative to U235	IRP	kBq U235 eq.
Ecotoxicity (freshwater)[2]	Potential Comparative Toxic Unit for ecosystems	ETP-fw	CTUe
Human toxicity, cancer effects[2]	Potential Comparative Toxic Unit for humans	HTP-c	CTUh
Human toxicity, non- cancer effects[2]	Potential Comparative Toxic Unit for humans	HTP-nc	CTUh
Land use related impacts / soil quality[2]	Potential Soil quality index	SQP	dimensionless
Disclaimer 1 – 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.			
Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.			

Figure 9: Resource Use, Waste and Output Flow Parameters

Parameter	Acronym	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, net calorific value
Use of renewable primary energy resources used as raw materials	PERM	MJ, net calorific value
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ, net calorific value
Use of non-renewable primary energy excluding non- renewable primary energy resources used as raw materials	PENRE	MJ, net calorific value
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ, net calorific value
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ, net calorific value
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ, net calorific value
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value
Net use of fresh water	FW	m^3
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	MJ per energy carrier

6 LCA Results

For more information about indicators see Section 0

LCA Results – Definitions and Disclaimers

Statement 1: the estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Statement 2: the result of ADP-minerals&metals and ADP-fossil shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Statement 3: The LCI result are calculating based on activity data from Simapro software and published EPD.

Figure 10: Core Indicator Results for 1 tonne structural steel hollow sections

		Raw Material Supply	Transport	Manufacturing	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Indicator Acronym	**Unit**	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	2.37E+03	1.16E+01	2.38E+00	0.00E+00	9.62E+00	0.00E+00	9.13E-01	-1.72E+01
GWP-fossil	kg CO_2 eq.	2.37E+03	1.16E+01	2.38E+00	0.00E+00	9.62E+00	0.00E+00	9.11E-01	-1.28E+01
GWP-biogenic	kg CO_2 eq.	-2.64E-01	1.11E-02	5.07E-03	0.00E+00	3.24E-03	0.00E+00	5.22E-04	-4.69E+00
GWP-luluc	kg CO_2 eq.	4.84E-01	2.20E-02	1.58E-03	0.00E+00	4.95E-03	0.00E+00	5.50E-04	2.94E-01
ODP	kg CFC 11 eq.	3.57E-05	1.59E-07	4.16E-08	0.00E+00	1.44E-07	0.00E+00	2.64E-08	3.02E-05
AP	mol H^+ eq.	7.33E+00	9.78E-02	1.08E-02	0.00E+00	3.40E-02	0.00E+00	6.87E-03	1.87E+00
EP-freshwater	kg PO_4 eq.	1.36E+00	1.04E-03	1.16E-03	0.00E+00	7.81E-04	0.00E+00	7.59E-05	4.73E-01
EP-marine	kg N eq.	1.56E+00	4.34E-02	2.46E-03	0.00E+00	1.12E-02	0.00E+00	2.64E-03	5.96E-01
EP-terrestrial	mol N eq.	1.49E+01	4.71E-01	2.50E-02	0.00E+00	1.19E-01	0.00E+00	2.83E-02	7.26E+00
POCP	kg NMVOC eq.	1.20E+00	1.32E-01	1.13E-02	0.00E+00	4.58E-02	0.00E+00	9.84E-03	4.63E+00
ADP- minerals&metals[2]	kg Sb eq.	1.08E+01	1.59E-05	1.71E-05	0.00E+00	3.07E-05	0.00E+00	1.27E-06	-2.73E-03
ADP-fossil[2]	MJ, net calorific value	1.62E+04	1.43E+02	2.52E+01	0.00E+00	1.35E+02	0.00E+00	2.27E+01	5.67E+02
WDP	m^3 world eq. deprived	-3.81E+03	8.24E-01	-1.73E-01	0.00E+00	5.99E-01	0.00E+00	1.00E+00	-1.61E+04

Figure 11: Core Indicator Results for 1 tonne structural steel-built ups

		Raw Material Supply	Transport	Manufacturing	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Indicator Acronym	**Unit**	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	2.21E+03	6.48E+00	2.38E+00	0.00E+00	9.62E+00	0.00E+00	9.13E-01	-1.72E+01
GWP-fossil	kg CO_2 eq.	2.21E+03	6.47E+00	2.38E+00	0.00E+00	9.62E+00	0.00E+00	9.11E-01	-1.28E+01
GWP-biogenic	kg CO_2 eq.	3.23E-01	2.26E-03	5.07E-03	0.00E+00	3.24E-03	0.00E+00	5.22E-04	-4.69E+00
GWP-luluc	kg CO_2 eq.	7.98E-01	3.38E-03	1.58E-03	0.00E+00	4.95E-03	0.00E+00	5.50E-04	2.94E-01
ODP	kg CFC 11 eq.	5.76E-05	1.03E-07	4.16E-08	0.00E+00	1.44E-07	0.00E+00	2.64E-08	3.02E-05
AP	mol H^+ eq.	6.69E+00	2.85E-02	1.08E-02	0.00E+00	3.40E-02	0.00E+00	6.87E-03	1.87E+00
EP-freshwater	kg PO_4 eq.	7.66E-01	5.27E-04	1.16E-03	0.00E+00	7.81E-04	0.00E+00	7.59E-05	4.73E-01
EP-marine	kg N eq.	1.55E+00	1.04E-02	2.46E-03	0.00E+00	1.12E-02	0.00E+00	2.64E-03	5.96E-01
EP-terrestrial	mol N eq.	1.49E+01	1.12E-01	2.50E-02	0.00E+00	1.19E-01	0.00E+00	2.83E-02	7.26E+00

POCP	kg NMVOC eq.	8.61E-01	3.83E-02	1.13E-02	0.00E+00	4.58E-02	0.00E+00	9.84E-03	4.63E+00
ADP- minerals&metals[2]	kg Sb eq.	6.25E-03	2.08E-05	1.71E-05	0.00E+00	3.07E-05	0.00E+00	1.27E-06	-2.73E-03
ADP-fossil[2]	MJ, net calorific value	2.49E+04	9.17E+01	2.52E+01	0.00E+00	1.35E+02	0.00E+00	2.27E+01	5.67E+02
WDP	m^3 world eq. deprived	-3.76E+03	4.04E-01	-1.73E-01	0.00E+00	5.99E-01	0.00E+00	1.00E+00	-1.61E+04

Figure 12: Additional Indicator Results for 1 tonne structural steel hollow sections

		Raw Material Supply	Transport	Manufacturing	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Indicator Acronym	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidence	9.71E-05	3.49E-07	2.07E-07	0.00E+00	7.64E-07	0.00E+00	1.50E-07	5.15E-05
IRP[1]	kBq U235 eq.	1.71E+03	2.35E-01	7.71E-02	0.00E+00	1.15E-01	0.00E+00	1.44E-02	3.04E+04
ETP-fw[2]	CTUe	2.28E+03	6.99E+01	1.05E+01	0.00E+00	7.55E+01	0.00E+00	1.07E+01	3.11E+03
HTP-c[2]	CTUh	6.44E+02	5.51E-09	2.89E+00	0.00E+00	4.35E-09	0.00E+00	3.88E-10	6.48E-06
HTP-nc[2]	CTUh	7.90E-07	5.33E-08	1.91E-08	0.00E+00	9.71E-08	0.00E+00	4.86E-09	5.89E-06
SQP[2]	dimensionless	1.75E-06	9.50E+01	5.37E-08	0.00E+00	8.06E+01	0.00E+00	4.51E+01	2.80E+03

Figure 13: Additional Indicator Results for 1 tonne structural steel-built ups

		Raw Material Supply	Transport	Manufacturing	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Indicator Acronym	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidence	9.71E-05	5.30E-07	2.07E-07	0.00E+00	7.64E-07	0.00E+00	1.50E-07	5.15E-05
IRP[1]	kBq U235 eq.	1.69E+03	7.80E-02	7.71E-02	0.00E+00	1.15E-01	0.00E+00	1.44E-02	3.04E+04
ETP-fw[2]	CTUe	2.32E+03	5.03E+01	1.05E+01	0.00E+00	7.55E+01	0.00E+00	1.07E+01	3.11E+03
HTP-c[2]	CTUh	6.68E+02	2.95E-09	2.89E+00	0.00E+00	4.35E-09	0.00E+00	3.88E-10	6.48E-06
HTP-nc[2]	CTUh	9.12E-07	6.58E-08	1.91E-08	0.00E+00	9.71E-08	0.00E+00	4.86E-09	5.89E-06
SQP[2]	dimensionless	2.11E-06	5.46E+01	5.37E-08	0.00E+00	8.06E+01	0.00E+00	4.51E+01	2.80E+03

Figure 14: Biogenic Carbon Content of 1 tonne structural steel hollow sections/steel-built ups at Factory Gate

Biogenic carbon content	Unit (1 tonne structural steel hollow sections/steel-built ups)

Biogenic carbon content in product	**0 kg C**
Biogenic carbon content in accompanying packaging	**0 kg C**
NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO2.	

Figure 15: Resource Use, Waste and Output Flow for 1 tonne structural steel hollow sections

		Raw Material Supply	Transport	Manufacturing	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Resource Acronym	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ, net calorific value	2.67E+02	3.04E+00	2.28E+00	0.00E+00	1.72E+00	0.00E+00	1.94E-01	2.97E+02
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	0.00E+00
PERT	MJ, net calorific value	2.67E+02	3.04E+00	2.28E+00	0.00E+00	1.72E+00	0.00E+00	1.94E-01	2.97E+02
PENRE	MJ, net calorific value	2.67E+04	1.43E+02	2.52E+01	0.00E+00	1.35E+02	0.00E+00	2.27E+01	5.65E+02
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	0.00E+00
PENRT	MJ, net calorific value	2.67E+04	1.43E+02	2.52E+01	0.00E+00	1.35E+02	0.00E+00	2.27E+01	5.65E+02
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, net calorific value	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, net calorific value	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	9.72E+03	2.74E-02	3.27E-03	0.00E+00	1.89E-02	0.00E+00	2.41E-02	-3.63E+00
HWD	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
NHWD	kg	0.00E+00	0.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E+02	0.00E+00
RWD	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
CRU	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
MFR	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	8.50 E+02	0.00 E+00
MER	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
EE	MJ per energy carrier	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

Figure 16: Resource Use, Waste and Output Flow for 1 tonne structural steel-built ups

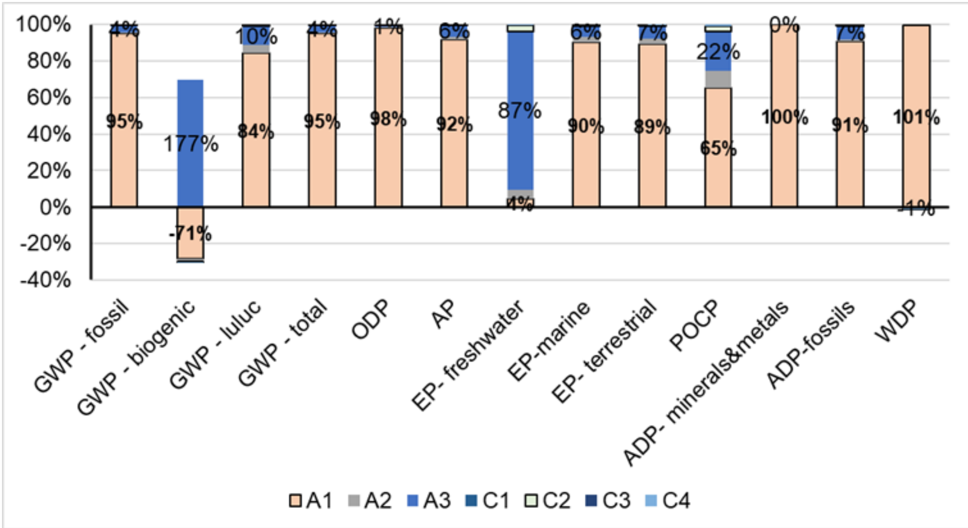
		Raw Material Supply	Transport	Manufacturing	Deconstruction and Demolition	Transport	Waste Processing	Disposal	Reuse Recovery and Potential
Resource Acronym	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ, net calorific value	3.43E+02	1.17E+00	2.28E+00	0.00E+00	1.72E+00	0.00E+00	1.94E-01	2.97E+02
PERM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	3.43E+02	1.17E+00	2.28E+00	0.00E+00	1.72E+00	0.00E+00	1.94E-01	2.97E+02
PENRE	MJ, net calorific value	2.52E+04	9.17E+01	2.52E+01	0.00E+00	1.35E+02	0.00E+00	2.27E+01	5.65E+02
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	0.00E+00
PENRT	MJ, net calorific value	2.52E+04	9.17E+01	2.52E+01	0.00E+00	1.35E+02	0.00E+00	2.27E+01	5.65E+02
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, net calorific value	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, net calorific value	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	1.72E+00	1.31E-02	2.65E-01	0.00E+00	1.89E-02	0.00E+00	2.41E-02	-3.63E+00
HWD	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
NHWD	kg	0.00E+00	0.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E+02	0.00E+00
RWD	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
CRU	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
MFR	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	8.50E+02	0.00 E+00
MER	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
EE	MJ per energy carrier	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

7 Interpretation

The contribution results of the process and main life cycle stages are demonstrated in Figure 16-17.

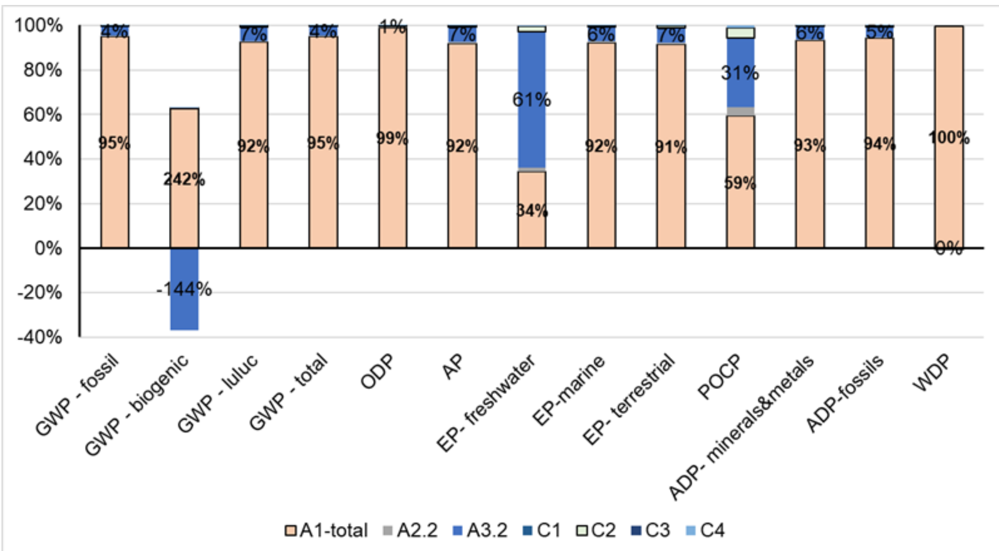
For the steel hollow product, it can be concluded that, the production stage is the dominant source of the environmental impacts among various life cycle stages. The production stage A1 accounts for 95% of the total life cycle GWP impacts as well as 95% of the total fossil resource use. The high impact intensity of the production stage indicates that the use of materials for the steel hollow product is relatively significant.

Figure 17: Life cycle impact contribution analysis- Structural steel hollow sections



For the steel structural built-up product, it can be concluded that, the production stage is the dominant source of the environmental impacts among various life cycle stages. The production stage A1 accounts for 95% of the total life cycle GWP impacts as well as 95% of the total fossil resource use. The high impact intensity of the production stage indicates that the use of materials for the Structural built ups product is relatively significant.

Figure 18: Life cycle impact contribution analysis- Structural built ups



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