

Environmental Product Declaration (EPD)
According to ISO 14025 and EN
15804+A2:2019

Hot-dip galvanized steel pipes & tubes

Registration number:	EPD-Kiwa-EE-216056-EN
Issue date:	10-11-2025
Valid until:	10-11-2030
Declaration owner:	Tianjin Youfa Steel Pipe Group Co., Ltd
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified



1 General information

1.1 PRODUCT

Hot-dip galvanized steel pipes & tubes

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-216056-EN

1.3 VALIDITY

Issue date: 10-11-2025

Valid until: 10-11-2030

1.4 PROGRAMME OPERATOR

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13355 Berlin
DE



Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



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(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Tianjin Youfa Steel Pipe Group Co., Ltd

Address: No.1 Keji Rd, Ygufa industrial Park, Daqiu Zhuang Town, Jinghai District, 301606

Tianjin City, China

E-mail: suzy@youfasteelpipe.com

Website: www.Youfasteelpipe.com

Production location: Jiangsu Youfa Steel Pipe Co.,Ltd

Address production location: No.1, Zhongxing Avenue, Shangxing Town, Liyang City, Jiangsu, P.R.China, 213363 Liyang City

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External



Elisabeth Amat Guasch, Greenize

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-Ecobility Experts, General Programme Instructions "Product Level", SOP EE 1201_R.3.0 (03.06.2025)

Kiwa-Ecobility Experts, General Programme Instructions "Product Level" – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, SOP EE 1203_R.3.0 (03.06.2025)

1 General information

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.20 (2025-10-21)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Hot-dip galvanized steel pipes & tubes' with the calculation identifier ReTHiNK-116056.

2 Product

2.1 PRODUCT DESCRIPTION

Hot-dip galvanized steel pipes & tubes are circular and square profiles. These products are manufactured in compliance with EN 10219-1 (CE marked) as well as AS 1074 and AS/NZS 1163 standards.

Composition of the products is available in the following table:

Material	Value	Unit
Coils & strips	97.75	%
Zinc coating	0.25	%

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Hot-dip galvanized steel pipes & tubes are available in circular, square, and rectangular profiles. These products are widely used in agricultural greenhouses, fire protection systems, gas and water supply, drainage, highway guardrails, and other applications. The products are primarily employed in curtain walls, construction, machinery manufacturing, steel structure projects, shipbuilding, solar power supports, power engineering, power plants, agricultural and chemical machinery, glass curtain walls, automotive chassis, airport construction, and more. Hot-dip galvanizing is particularly essential for structures located in aggressive or corrosion-prone environments.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The lifetime of structural pipes will be limited by the service life of the construction. Under these circumstances, no RSL according to the relevant ISO standards and EN 15804 can be declared.

USED RSL (YR) IN THIS LCA CALCULATION:

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2.4 TECHNICAL DATA

Base materials

Parameter	Value	Unit
Steel material grades (main)	Q235 Q355 (according to ISO 630; EN 10025)	-

Dimensions	Vary based on specific project requirements	-
Thickness of coating	45-85 (as per EN 1461;GB/T 13912)	μm

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any (or less than 0.1%) of the substances of very high concern (SVHC) on the REACH candidate list.

2.6 DESCRIPTION PRODUCTION PROCESS

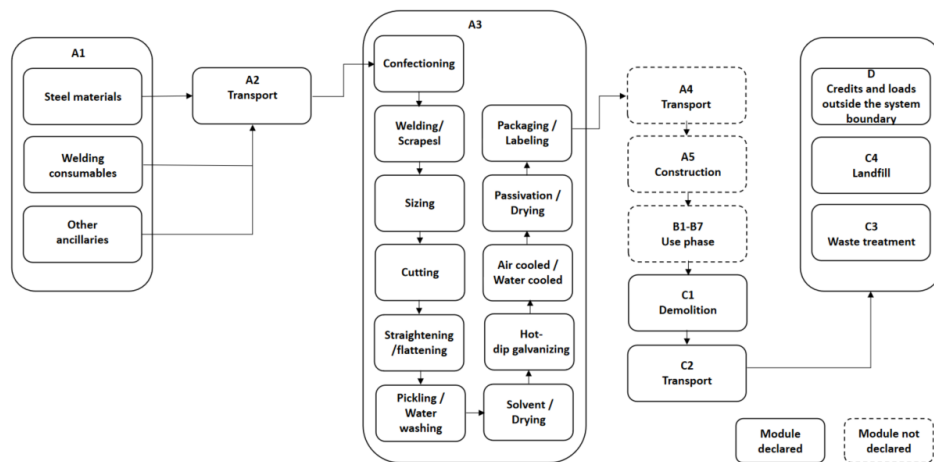
The production activitie is Jiangsu Youfa Steel Pipe Co., Ltd., located at No. 1, Zhongxing Avenue, Shangxing Town, Liyang City, Jiangsu, P.R.

All primary data, including material and energy exchanges within the production system and associated emissions, is sourced from the Jiangsu production site of Tianjin Youfa Pipe Group Co., Ltd.

The manufacturing contains the following processes:

- Loading materials,
- Confectioning,
- Welding/Scrapes,
- Sizing,
- Cutting,
- Straightening / Flattening,
- Pickling / Water washing,
- Solvent / Drying,
- Hot-dip galvanizing,
- Air cooled / Water cooled,
- Passivation / Drying,
- Packaging / Labeling.

2 Product



3 Calculation rules

3.1 DECLARED UNIT

1 ton

One metric ton of the hot-dip galvanized steel pipes & tubes is chosen as the declared unit.

Reference unit: ton (ton)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	ton
Weight per reference unit	1000.000	kg
Conversion factor to 1 kg	0.001000	ton

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for hot-dip galvanized steel pipes & tubes, the products of Jiangsu Youfa Steel Pipe Co.,Ltd. The data are globally representative, since Row (Rest of the World) Ecoinvent datasets were mainly used, which are most conservative and therefore applicable to other regions. Waste scenario data are representative for Europe as well as other regions where comparable waste processing technologies are used (e.g. U.S. A. , Canada).

3 Calculation rules

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do, therefore, not exceed the limit of 5% of energy use and mass.

Benefits and loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and / or useful energy carriers leaving the product system are considered in this LCA.

Excluded Processes: Note that due to the high production volume, the manufacturing infrastructure (building halls, metalworking machines, transportation of personnel to and within the plant, research and development activities, and long-term emissions) are excluded from this EPD.

3.6 ALLOCATION

Allocations were avoided as far as possible. No by-products or co-products are produced during the manufacture of the analysed product. The energy requirements of production were allocated to the individual products on the basis of energy consumption measurements. Specific information on the allocations within the background data can be found in the documentation of the Ecoinvent datasets.

3.7 DATA COLLECTION & REFERENCE PERIOD

The production data have been collected for the year 2024 (01 / 01 / 2024 – 31 / 12 / 2024) and, are, therefore up-to-date. All the relevant data for the raw materials, energy

consumption, production waste, emissions and suppliers are provided by Jiangsu Youfa Steel Pipe Co., Ltd.

3.8 ESTIMATES AND ASSUMPTIONS

- All material flows that contribute to more than 1% of the total mass, energy, or environmental impact of the system have been considered in the LCA, and all datasets chosen for the modules A1-A3 refer to the Rest-of-the-World or to China.
- For the main raw material, steel strips, it is assumed that all steel strips are produced using the Basic Oxygen Furnace (BOF) method. The profile for steel production via the converter process was selected from Ecoinvent 3.9.1 to reflect this conservative approach.
- Transport distances for all raw materials (raw materials, operating materials, packaging) could be recorded. A payload factor of 50 percent was used for all truck transports (suppliers, disposal transports, and internal transports), which corresponds to a full delivery and empty return trip.
- Consumption of 1.2l 43 MJ diesel per ton of products is assumed for the demolition of end-of-life products. This value is based on the average consumption of demolition machinery in the European Union, as reported in the Eurostat database.
- The waste scenario for this LCA was determined based on NMD ID 70, which relates to Steel, light. According to this standard, the waste treatment process comprises 94% recycling, 5% Re-use, and 1 % landfill. The iron or steel scrap shall have been segregated at source or while collecting and been kept separate, or the input wastes shall have been treated to separate the iron and steel scrap from the non-metal and non-ferrous components. All mechanical treatment (e.g. cutting, shearing, shredding or granulating, sorting, separation, cleaning, de-polluting, emptying) needed to prepare the material for direct input into final use shall have been completed. In accordance with the world steel method the impact of recycling is included in module D.

3.9 DATA QUALITY

According to the criteria of the "UN Environmental Global Guidance on LCA database development" mentioned in EN 15804+A2, the data quality for all three representativeness categories (geographical, technical and time) can be described as good.

All primary data, including material and energy exchanges within the production system and associated emissions, is sourced from the Jiangsu production site of Tianjin Youfa Pipe Group Co., Ltd. The secondary data is obtained from the Ecoinvent 3.9.1, "allocation, cut-off by classification - unit" database.

3 Calculation rules

The secondary data is obtained from the Ecoinvent 3.9.1, "allocation, cut-off by classification - unit" database, aligning with EN 15804 standards to ensure background data not exceeding 10 years.

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

3.10 POWER MIX

The mix of energy sources used to account for electricity consumption during the production of the hot-Dip galvanized steel pipe & tubes is as follows: 12.58% is from the own solar installation, with the remaining 87.42% sourced from the national grid mix.

Local based approach is used for modelling national grid mix at manufacturing sites.

The environmental profile for the own solar installation is "Electricity, low voltage {CN-JS} | electricity production, photovoltaic, 3kWp slanted-roof installation, single-Si, panel, mounted | Cut-off, U" (dataset ID: E3910001-8592), which has a GWP value of 0.087 kg CO₂eq/kWh.

The environmental profile for the national grid mix is "Electricity, medium voltage {CN} | market group for electricity, medium voltage | Cut-off, U" (dataset ID: T3910175), which has a GWP value of 0.944 kg CO₂eq/kWh.

4 Scenarios and additional technical information

4.1 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at end of life.

Description	Amount	Unit
(ei3.9.1) Diesel, burned in machine (incl. emissions)	1.200	l

4.2 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) Steel, construction profiles (NMD ID 70)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	50
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	50

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.3 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

4 Scenarios and additional technical information

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) Steel, construction profiles (NMD ID 70)	NL	0	1	0	94	5
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	NL	0	5	0	95	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) Steel, construction profiles (NMD ID 70)	0.000	9.775	0.000	918.807	48.873
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.000	1.127	0.000	21.419	0.000
Total	0.000	10.902	0.000	940.225	48.873

4.4 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) Steel, construction profiles (NMD ID 70)	731.791	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	21.419	0.000
Total	753.209	0.000

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER TON

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2.10E+3	1.30E+1	1.67E+2	2.28E+3	4.26E+0	7.53E+0	0.00E+0	7.15E-2	-7.51E+2
GWP-f	kg CO ₂ eq.	2.10E+3	1.29E+1	1.67E+2	2.28E+3	4.26E+0	7.50E+0	0.00E+0	7.14E-2	-7.52E+2
GWP-b	kg CO ₂ eq.	1.51E+0	3.66E-3	1.68E-1	1.68E+0	5.93E-4	2.44E-3	0.00E+0	4.36E-5	1.02E+0
GWP-luluc	kg CO ₂ eq.	1.36E+0	3.04E-2	1.22E-1	1.51E+0	4.80E-4	2.67E-2	0.00E+0	3.88E-5	2.17E-2
ODP	kg CFC 11 eq.	4.52E-5	2.14E-7	7.62E-6	5.30E-5	6.78E-8	1.33E-7	0.00E+0	2.07E-9	-2.63E-5
AP	mol H ⁺ eq.	1.93E+1	1.93E-1	7.00E+0	2.65E+1	3.95E-2	3.59E-2	0.00E+0	5.26E-4	-2.58E+0
EP-fw	kg P eq.	9.48E-2	9.71E-5	6.55E-3	1.01E-1	1.54E-5	7.46E-5	0.00E+0	6.80E-7	4.39E-2
EP-m	kg N eq.	2.16E+0	4.92E-2	3.25E-1	2.53E+0	1.83E-2	1.37E-2	0.00E+0	2.04E-4	-4.96E-1
EP-T	mol N eq.	6.95E+1	5.40E-1	3.00E+1	1.00E+2	1.99E-1	1.46E-1	0.00E+0	2.20E-3	-8.06E+0
POCP	kg NMVOC eq.	1.05E+1	1.58E-1	5.31E-1	1.12E+1	5.90E-2	4.97E-2	0.00E+0	7.73E-4	-5.14E+0
ADP-mm	kg Sb-eq.	3.61E-2	2.88E-5	1.54E-3	3.77E-2	1.49E-6	2.35E-5	0.00E+0	1.12E-7	-3.04E-2
ADP-f	MJ	2.23E+4	1.73E+2	1.83E+3	2.43E+4	5.58E+1	1.07E+2	0.00E+0	1.75E+0	-6.92E+3
WDP	m ³ world eq.	6.61E+2	7.27E-1	2.85E+1	6.90E+2	1.20E-1	5.87E-1	0.00E+0	6.66E-2	-9.38E+2

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratospheric ozone layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprivation potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PM	disease incidence	2.65E-4	8.60E-7	6.98E-5	3.35E-4	1.10E-6	7.41E-7	0.00E+0	1.17E-8	-6.74E-5
IR	kBq U235 eq.	2.45E+1	5.64E-2	3.50E+0	2.80E+1	1.14E-2	4.19E-2	0.00E+0	7.84E-4	4.81E+0
ETP-fw	CTUe	1.77E+4	1.10E+2	1.61E+3	1.94E+4	2.67E+1	7.93E+1	0.00E+0	1.03E+1	-3.04E+3
HTP-c	CTUh	1.18E-5	6.61E-9	6.70E-7	1.25E-5	1.31E-9	3.97E-9	0.00E+0	3.77E-11	6.55E-6
HTP-nc	CTUh	2.26E-5	1.02E-7	3.43E-6	2.61E-5	9.08E-9	8.63E-8	0.00E+0	1.25E-9	5.15E-5
SQP	Pt	5.24E+3	8.42E+1	3.41E+2	5.66E+3	3.76E+0	8.48E+1	0.00E+0	3.59E+0	-1.40E+3

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality index (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
ILCD type / level 3	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2
<p>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.</p>		
<p>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.</p>		

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1- A3	C1	C2	C3	C4	D
PERE	MJ	9.28E+2	2.03E+0	1.52E+2	1.08E+3	3.18E-1	1.52E+0	0.00E+0	3.08E-2	1.34E+2
PERM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	9.28E+2	2.03E+0	1.52E+2	1.08E+3	3.18E-1	1.52E+0	0.00E+0	3.08E-2	1.34E+2
PENRE	MJ	2.23E+4	1.73E+2	1.83E+3	2.43E+4	5.58E+1	1.08E+2	0.00E+0	1.75E+0	-6.92E+3
PENRM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	2.23E+4	1.73E+2	1.83E+3	2.43E+4	5.58E+1	1.08E+2	0.00E+0	1.75E+0	-6.92E+3
SM	Kg	1.97E+2	0.00E+0	5.73E+0	2.03E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m ³	1.78E+1	3.06E-2	9.98E-1	1.88E+1	4.38E-3	2.60E-2	0.00E+0	1.91E-3	-1.93E+1

PERE=Use of renewable primary energy excluding renewable primary energy resources used as raw materials | **PERM**=Use of renewable primary energy resources used as raw materials | **PERT**=Total use of renewable primary energy resources | **PENRE**=Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials | **PENRM**=Use of non-renewable primary energy resources used as raw materials | **PENRT**=Total use of non-renewable primary energy 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

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
HWD	Kg	3.85E-1	9.99E-4	1.15E-2	3.98E-1	3.76E-4	6.85E-4	0.00E+0	9.11E-6	-3.19E-1
NHWD	Kg	3.97E+2	6.79E+0	4.02E+1	4.44E+2	7.99E-2	7.10E+0	0.00E+0	1.09E+1	1.33E+2
RWD	Kg	1.53E-2	3.24E-5	2.62E-3	1.80E-2	6.12E-6	2.46E-5	0.00E+0	4.34E-7	3.53E-3

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	1.42E+0	1.42E+0	0.00E+0	0.00E+0	4.89E+1	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	3.92E+1	3.92E+1	0.00E+0	0.00E+0	9.40E+2	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

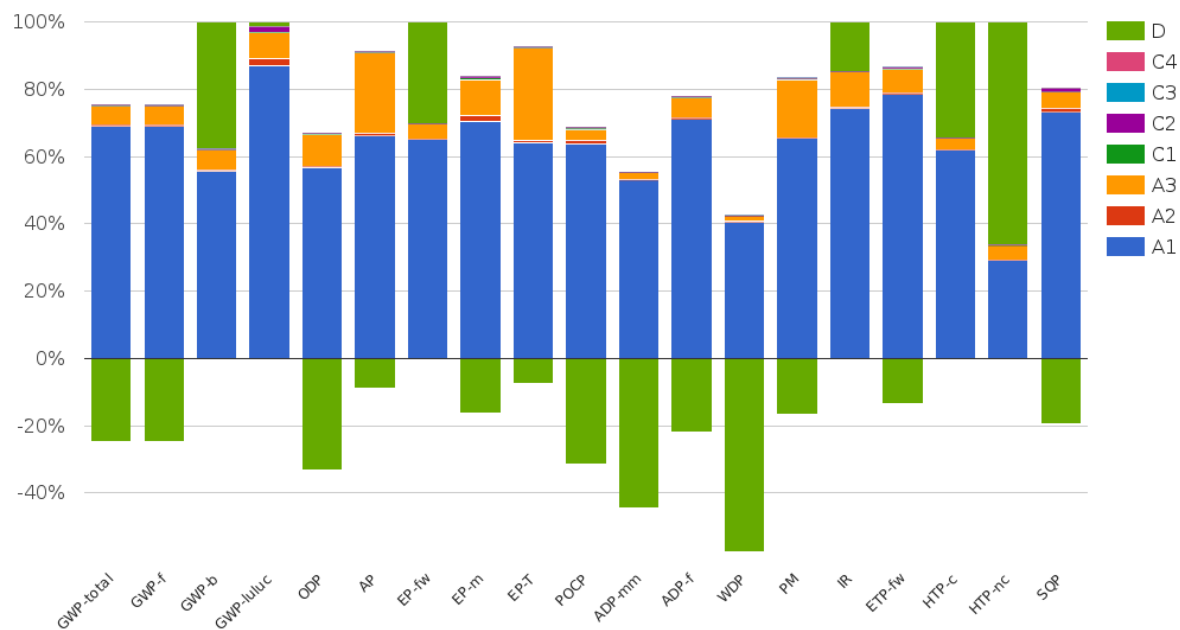
5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER TON

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per ton:

Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

6 Interpretation of results



The figure illustrates the impact categories for 1 ton of the hot-dip galvanized steel pipes & tubes. As depicted, Modules A1 and D emerge as the most significant contributors to all assessed indicators. The contribution of raw materials (A1) is notably higher, whereas transportation (A2 and C2) exhibits a comparatively minor impact.

For most indicators, Module D indicates environmental benefits or credits.

7 References

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