ENVIRONMENTAL FOOTPRINT INSTITUTE

Environmental Product Declaration

Under the general rules of the Environmental Footprint Institute.

Environmental Footprint in accordance with ISO 14040, ISO 14044, ISO 14025 and EN 15804+A1 without program registration for:

Steel pipes
Conares Metal Supply Ltd.

Diffusion institution:	Environmental Footprint Institute
Product group classification:	UN CPC 3511
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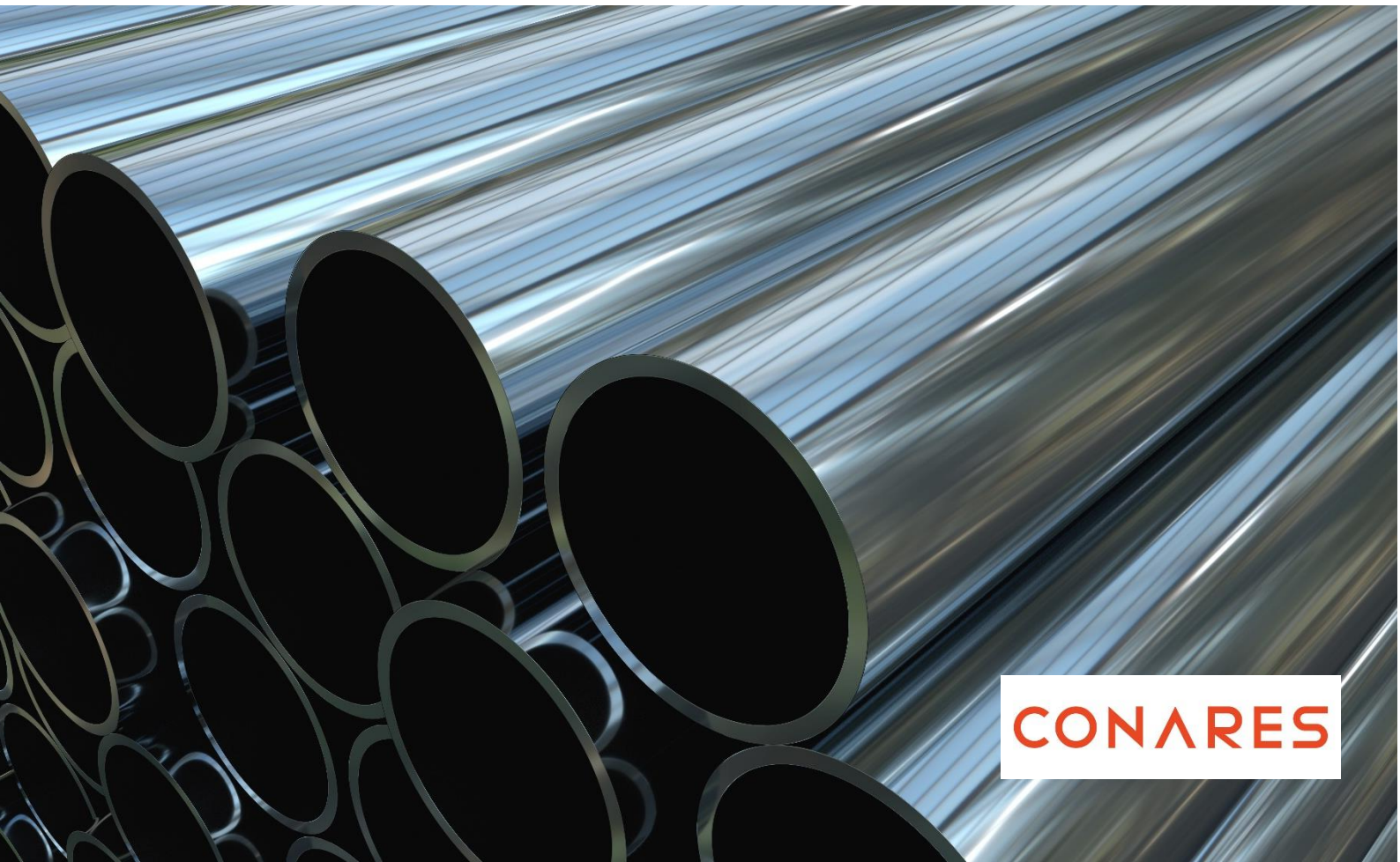
	An Environmental Product Declaration (EPD) should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environmentalfootprintinstitute.org
Geographical scope:	United Arab Emirates (UAE)



GENERAL INFORMATION

Product Provider

Conares Metal Supply Ltd.
P. O. Box 2854
Dubai, United Arab Emirates

Conares Metal Supply Ltd. (Conares), based in Dubai, in the United Arab Emirates, is a premier producer company of quality steel rebars & pipes; having a total manufacturing capacity of more than 1,000,000 MT annually. This Environmental Product Declaration (EPD) refers to the manufacture and distribution of steel pipes.

Since its inception in 1988, Conares initially focused on steel trading. Having built extensive partnerships with renowned steel plants across the world, it brought the world-best competencies to the region, by setting up its own state of art manufacturing facility in UAE.

Since 2005, Conares manufactures steel pipes with a size range of 1/2" to 12". The Pipe Mills have an annual production capacity of over 800,000 MT per year, coupled with the Galvanizing Mill of 300,000 MT per year. The pipes are produced in circular, rectangular & square sections conforming to leading international standards. Apart from its strong demand regionally, the pipes manufactured by Conares have a growing presence internationally. This EPD includes the environmental analysis of the distribution of the steel pipes.

Conares has the production plant in Dubai, United Arab Emirates. The Quality and Environment Managers of Conares has commissioned the development of this Environmental Product Declaration (EPD) to report the environmental assessment of the life cycle of steel pipes manufactured in this plant.

Products

Conares produces steel pipes in a wide range of sizes and finishes. This EPD comprises the general environmental assessment of the following Conares types of steel pipes:

- Galvanized steel pipes: To preserve steel for a long time, galvanized pipes are produced from the unpainted pipes by coating them with zinc.
- Electric Resistance Welded steel pipes: ERW pipes are manufactured from HR coils.
- Black painted steel pipes: Black painted pipes are produced from ERW unpainted pipes.

Both type of pipes has the same process flow, from raw material (HR coil) extraction to unpainted pipes (raw pipes) production. For pipe finishing, and under customer requirement, Conares do black painting or galvanizing. During the production period analysed in this EPD, 66% of the production were ERW pipes and 34% of the production were Galvanized pipes.

Conares sustainable practices

Conares operations are certified in accordance with industry standards to meet regulations. These are some of the sustainable practices throughout their manufacturing operations:

- International certification Quality Management System ISO 9001:2015.
- International certification UL Mark.
- International certification CE Mark.
- International certification NSF.
- During the weld quality testing, if the pipes do not pass the non-destructive quality testing, the reject products are recovered by hydro/leak tightness test.

Declared Unit

This EPD presents the environmental impacts of the production and distribution of 1 metric ton (MT) of Steel Pipe manufactured by Conares plant in Dubai, UAE.

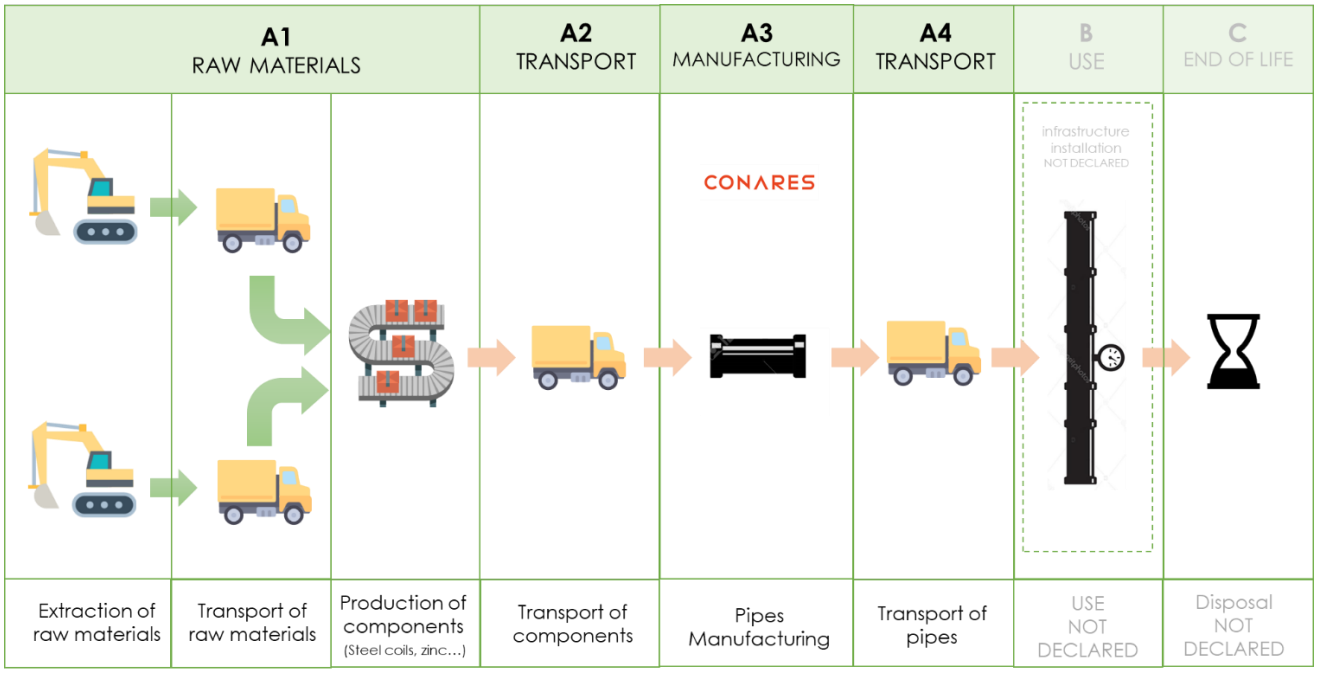
The EPD only covers the Cradle to Gate stage plus distribution stage because other downstream stages, like use phase or disposal, are very dependent on scenarios, and are better developed for specific installation or construction works EPDs.

Considering that the manufacturing processes are very similar regardless the type of Steel Pipe, this EPD represents the environmental impacts of a generic steel pipe manufacturing. To allow a general distribution of all the raw materials, regardless the type of pipe, the number of components supplied to the plant in 2018 has been divided by the total production of ERW and Galvanized pipes in 2018.

System boundaries

A simplified model of the manufacture process of steel pipes production is described, enumerating the main activities included in the system boundaries. In the boundaries of this EPD, the end of the product life cycle is the gate of the plant that do Steel Pipe manufacturing. This EPD includes the distribution of the product to the international customers in Module A4.

It is important to consider that this EPD refers to the steel pipe manufacturing and distribution, including the steel coil manufacture. Raw materials in Module A1 include the steel coils, process in module A3 include the painting, galvanizing and packaging of the pipes, process in Module A4 includes the international distribution of pipes.



The scope of this EPD is "cradle to gate with options".

Possible scopes of the Life Cycle Assessment (LCA) defined in EN 15804:2012+A1:2014

Product stage			**Construction process stage**		Use stage						End of life stage					Resource Recovery Stage
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	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**	**X**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = Included, ND=Module not declared, NR= Module not relevant

Modules from A5 to D are not declared (X refers to considered stage, NR refers to not relevant stage and ND to not declared stage).

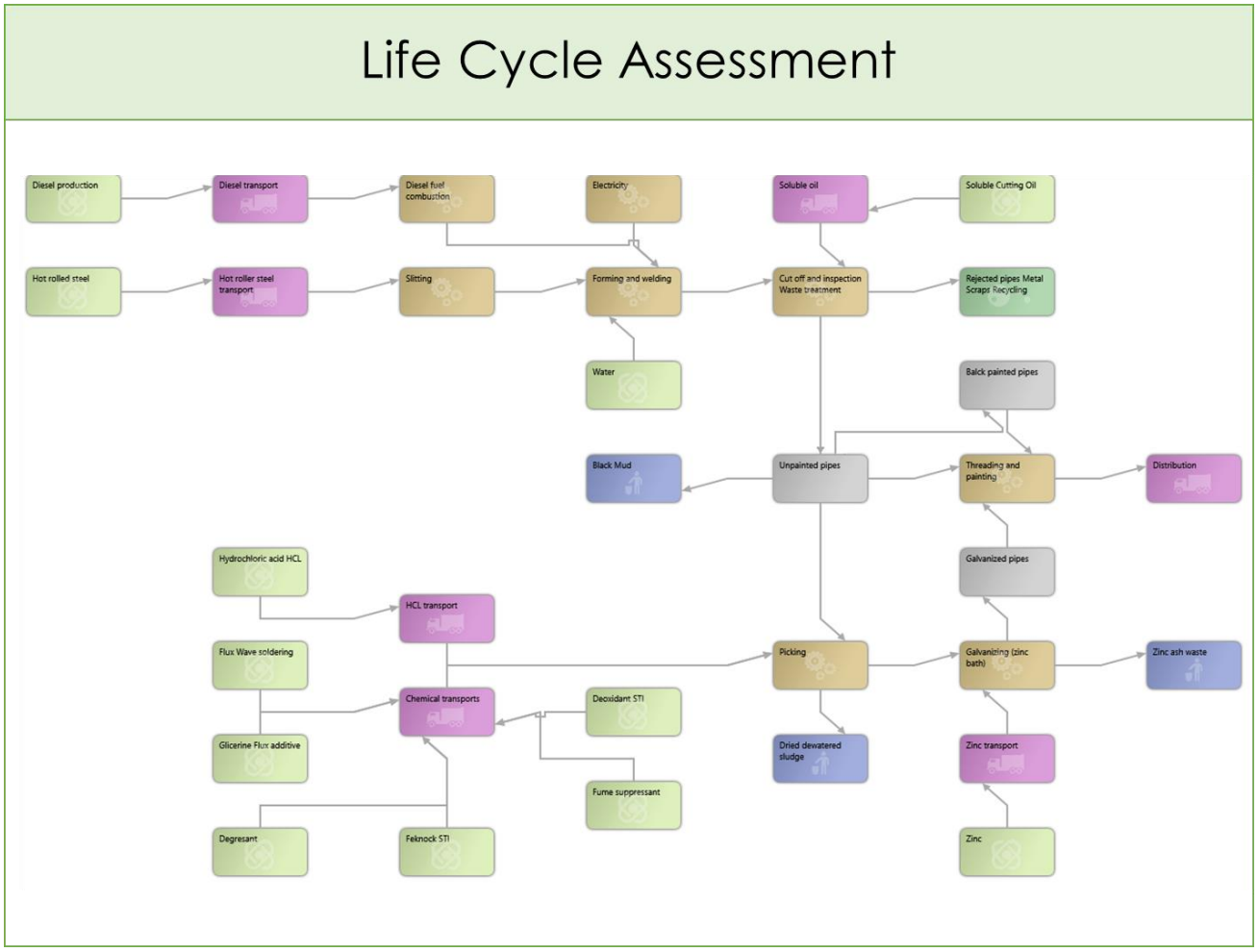
Considering that the analysis has a "cradle to gate with options" scope (A1-A3 and A4) the Reference Product Life is nor relevant and has not been included.

In the following schemes, the modules are linked to the real phases of the manufacturing and distribution process.

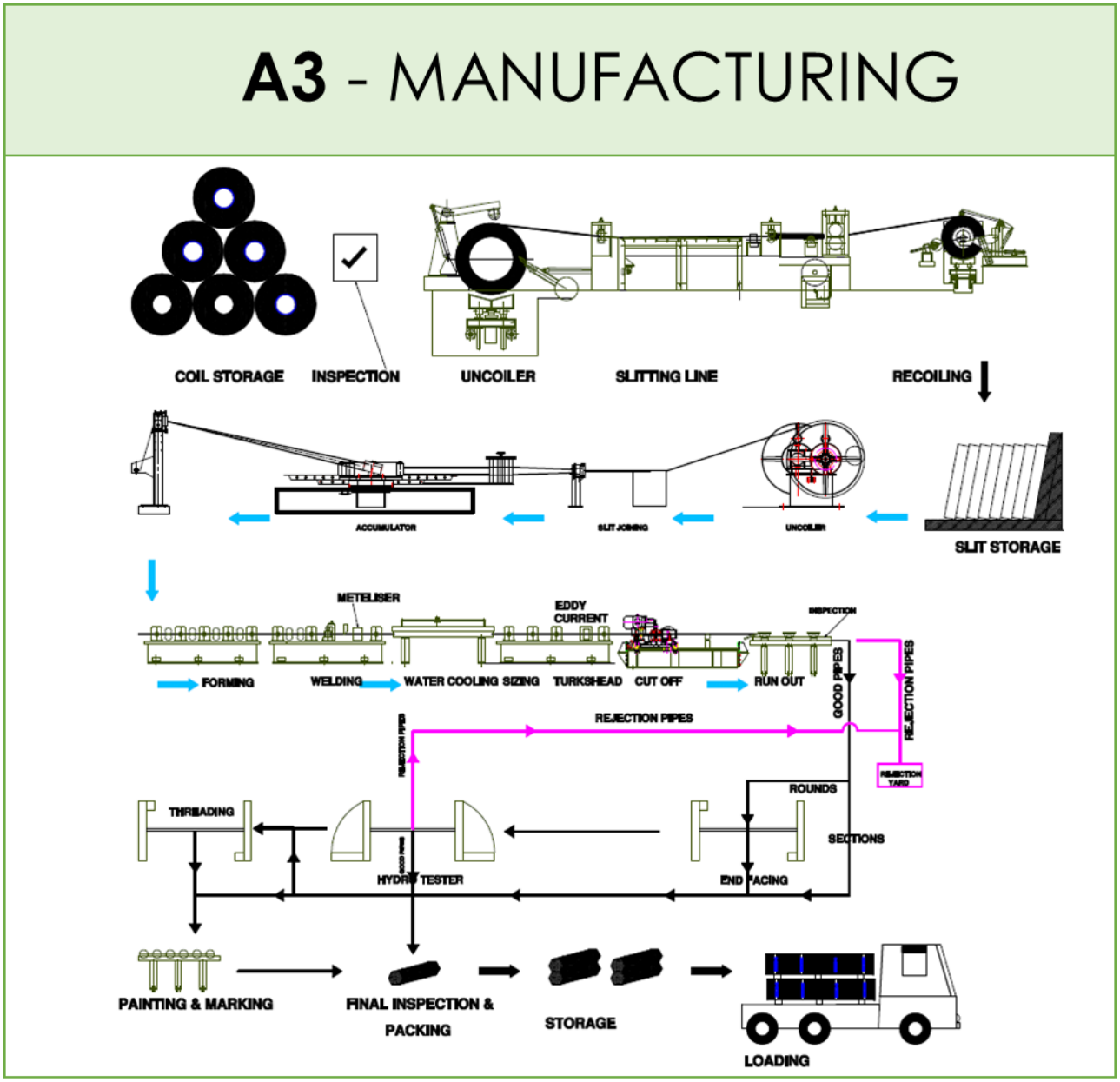
Product Stage

The raw materials such as: steel coils, zinc, flux and other components, are transported to the plant where steel pipes are manufactured. The manufacture of the steel coils and other raw materials and components have been included in the system boundaries of the life cycle assessment. Once the raw material and other components are manufactured, they are transported to the facilities of Conares plant in Dubai, where the steel pipes are manufactured.

The following diagram (generated by Air.e LCA software) comprises the raw materials, components, transports, processes, energy and fuel consumption and wastes included in the life cycle assessment:



Here we include a brief description of the steel pipes manufacture process (A3 module):



1. **Slitting:** The Roller Coil is loaded to a slitting machine. The slit coils are used to form the pipe.

2. **Entry:** Uncoilers unwind the slit coil. Multiple unwound coils are accumulated to maintain a continuous feed.

3. **Forming:** The slit passes though different rolls to form the desired pipe shape & size. The seams are welded to hold its shape

4. **Annealing:** Annealing is the process of treating the weld to maintain uniform properties of steel across the seam of the pipe. This is carried out on the basis of client´s requirements.

5. **Shear cut**: Cut into commercial lengths & End Faced.

6. **Testing:** The online non-destructive testing equipment measures the quality of the weld. Most reject products are recovered by hydro static testing.

7. **Galvanizing:** to preserve steel for a long period, it is galvanized to avoid corrosion. It is dipped into a series of chemicals for surface preparation & is bathed in molten Zinc.

8. **Finishing:** Threaded & Socketed, Cooled, Painted and Packed as required.

Content declaration

The following list includes the main materials used in the manufacture of the steel pipes. Only steel and zinc are part of the final product.

Material	Percentage (Approx.)
Steel	99%
Zinc	1%
Flux	Not part of final product
HCL hydrochloric acid	Not part of final product
Acidic degreaser	Not part of final product
Iron reducing agent	Not part of final product
Deoxidant	Not part of final product
Fume suppressant	Not part of final product

Substances listed in the "Candidate List of SVHC"

The following list includes all the substances used to manufacture the product that are included in the Candidate List of Substances of very high concern by European Chemicals Agency and their content exceeds 0,1% of the weight of the product.

For black and unpainted steel pipes, Conares does not use any chemicals stated in the SVHC candidate list.

During pipe galvanizing process zinc ingots is used, which contains lead in a percentage less than 0.001 %.

Substance	EC number	CAS number
Lead	231-100-4	7439-92-1

TECHNICAL INFORMATION

Electricity consumption - A3

Electricity consumption and diesel fuel are the types of energy used in the steel pipes manufacturing. A specific dataset with the emissions factors corresponding to the UAE electricity mix in 2018 has been developed for this LCA. The emission factor for high voltage electricity consumption used is GWP 100a is 0,57 Kg CO_2e/KWh. The total emissions of CO_2e due to total electricity consumption are 37,22 kg CO_2e per metric ton of steel pipe.

Diesel consumption – A3

A specific dataset with the emissions factors corresponding to the diesel combustion in machinery has been developed for this LCA. For example, the WTT and combustion emission factor for climate change for diesel is GWP 100a is 3,24 Kg CO_2e/litre. The total emissions of CO_2e due to total diesel consumption are 7,11 kg CO_2e per metric ton of steel pipe. Indirect emissions due to diesel production are included in the environmental impact values reported in this EFD.

Transport to the use site Stage – A4

The steel pipes are provided to customers all around the world. To create a scenario of the A4 phase, all the distribution shipments of steel pipes sold from January 2018 to December 2018 have been included in the analysis. The transport means were by cargo ship or 40 feet truck, as described in the following table.

Scenario	Parameter	Units	Value per functional unit
A2 and A4–Ship	Vehicle type used for transport	Transoceanic cargo ship	n/a
	Vehicle load capacity	Kg (dw)	50.000.000
	Fuel type and consumption	Litres of heavy fuel oil per km	0,24
	Distance to construction site	Km	See detailed table
	Capacity utilization	%	See detailed table
	Bulk density of transported products	Kg/m3	n/a
	Volume capacity utilisation factor	~~n/a~~	~~1~~
A2 and A4–Truck	Vehicle type used for transport	> 32t Truck	n/a
	Vehicle load capacity	Kg	29.960 kg
	Fuel type and consumption	Litres of diesel per km	0,38
	Distance to construction site	Km	See detailed table
	Capacity utilization	%	See detailed table
	Bulk density of transported products	Kg/m3	n/a
	Volume capacity utilisation factor	n/a	1

For every destination, the total amount of products delivered to customers have been considered according to the following detailed table:

Mean of transport	Destination [1]	Distance	% of FU
A4-Truck	Abu Dhabi	139 km	7,01%
	Al Quoz	13 km	0,35%
	Dubai	2 km	10,34%
	Jebel Ali	50 km	1,58%
	Jeddah	2,230 km	0,33%
	Kuwait	1,210 km	0,05%
	Hamriyah FZ Sharjah	45 km	0,20%
	Sharjah	66 km	1,77%
	Ajman	44 km	0,48%
	Al Ain	145 km	0,10%
	Manama	854 km	1,04%
	Ras Al Khaima	106 km	0,05%
	Muscat	450 km	3,29%
	Madaam	71 km	0,58%
	Safat	1270 km	0,24%
A4-Ship	CY Perth	3,867 nm	0,04%
	CY Rotterdam	6,329 nm	0,67%
	CY Altamira	9,752 nm	2,45%
	Antwerp	6,234 nm	3,86%
	Liverpool	6,136 nm	1,51%
	CY Riga	7,266 nm	1,09%
	Sydney Australia	7,816 nm	0,54%
	Los Angeles	9,611 nm	2,10%
	Toronto	11,190 nm	1,71%
	San Nicolas	3,882 nm	1,84%
	California	11,190 nm	0,04%
	Montreal	8,065 nm	4,00%
	Houston	9,642 nm	10,79%
	Melbourne	7,5510 nm	0,13%
	Seattle, USA	10,554 nm	1,73%
	Savannah	8,571 nm	0,63%
	Long Beach, CA	11,190 nm	0,23%
	Baltimore	8,355 nm	0,04%

[1] Customer destination name hidden for confidential purposes

Calculation rules

Version 3.5 of software Air.e LCA™ with Ecoinvent™ 3.5 database have been used for LCA modelling and impacts calculations.

ILCD rev 2.0 April 2018 has been used for impacts methods.

Annual Statistics 2018 report from Dubai Electricity & Water Authority has been used to create the model of Dubai electricity mix.

All processes in main facilities related to the product have been included in the assessment.

Minor components not directly related to the product, with less than 1% impact, such as office supplies, have been excluded from the assessment.

Only main means of transport have been included for materials purchases and delivery of coil coating paints. "Last mile" transport has been excluded. As far as final destinations of coil coating paints are not known in detail, transport distances have been calculated from factory to city purchaser. Operation in port has also been excluded.

Road distances calculated using Google Maps. Maritime distances calculated using MarineTraffic Voyage Planner.

When allocation rules where needed in the LCA, a mass approach has been used.

Cut-off rules: more than 99% of the materials and energy consumption have been included.

All transports of components have been included in the LCA considering real distances travelled by materials used from January 2018 to December 2018. Transport of raw materials needed to manufacture components are estimated in a global scale according to Ecoinvent™ criteria.

The Polluter Payer Principle and the Modularity Principle had been followed.

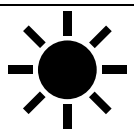
ENVIRONMENTAL PERFORMANCE

In the following tables, the environmental performance of 1 metric ton (MT) of steel pipe is presented for every sub-phase. The environmental impacts calculation follows the environmental footprint methodology.

Potential Environmental Impact

	A1-A2 Raw materials production and supply	A3 Steel pipes manufacturing	A4 Distribution	Coproducts and wastes	**Total**
Global Warming Potential (GWP100) (kg of CO_2 equivalent)	2,214.44	47.14	98.51	-201.69	**2,158,40**
Ozone depletion (kg of CFC11 equivalent)	100.33e-6	4.90e-6	22.00e-6	-9.03e-6	**11.82e-5**
Acidification of land and water (mol H+e)	9.91	0.05	1.36	-0.85	**10.47**
Eutrophication (kg of P equivalent)	0.81	0.01	0.02	-0.07	**0.75**
Photochemical ozone creation (kg of NMVOC equivalent)	8.87	0.07	0.53	-0.78	**8.69**
Depletion of resources (final reserve) (kg of Sb equivalent)	0.02	5.98e-6	1.00e-4	-15.98e-5	**0.02**
Depletion of resources (fossil) kJ net calorific value	21.43	0.85	1.54	-1.96	**21.85**

Use of resources

	A1-A3 Product stage	A4 Distribution	**Total**
Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials	9.55e5	2.71e4	**9.82e5**
Use of RENEWABLE primary energy resources used as raw materials	8.52	<0.01	**8.52**
Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials)	9.55e5	2.71e4	**9.82e5**

Data in MJ, net calorific value

	A1-A3 Product stage	A4 Distribution	**Total**
Use of NON- RENEWABLE primary energy excluding non- renewable primary energy resources used as raw materials	2.23e7	2.23 e6	**2.45e7**
Use of NON-RENEWABLE primary energy resources used as raw materials	59e4	<0,01	59e4
Total use of NON-RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials)	2.23e7	2.23 e6	**2.45e7**

Data in MJ, net calorific value

	A1-A3 Product stage	A4 Distribution	**Total**
Use of secondary material	<0.01	<0.01	**<0.01**

Data in kg

	A1-A3 Product stage	A4 Distribution	**Total**
Use of net fresh water	1.07e5	7.28e4	**1.35e5**

Data in m3

	A1-A3 Product stage	A4 Distribution	**Total**
Use of RENEWABLE secondary fuels	<0.01	<0.01	**<0.01**
Use of NON-RENEWABLE secondary fuels	<0.01	<0.01	**<0.01**

Data in MJ, net calorific value

Waste disposed

	A1-A3 Product stage	Description
Hazardous waste disposed	649.35	Dried dewatered sludge
Non-hazardous waste disposed	324.67	Black Mud and Zinc ash waste
Radioactive waste disposed	<0.01	

Data in kg

Other output flows

	A1-A3 Product stage	Description
Components for re-use (Kg)	0	0
Materials for recycling (Kg)[2]	900.00	Rejected pipes Metal Scraps Recycling
Materials for energy recovery (MJ)	0	0
Exported energy (MJ)	0	0

DIFFERENCES VERSUS PREVIOUS VERSIONS OF THE EFD

This is the first version of the Environmental Product Declaration (EPD) so there is no previous version of this EPD.

[2] Theoretically all steel pipes can be recycled after end of life.

DIFFUSION INSTITUTION

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Product category rules (PCR): UNE-EN 15804:2012
Independent verification of the declaration and data, according to ISO 14040 and ISO 14025: ☐ Process Certification (internal) X Verification (external)
Independent verification of the declaration and data, according to ISO 14025:2006: ☐ EPD Process Certification (internal) X EPD Verification (external)
Third party verifier: Alfredo Costalago Alcántara Accredited by: Approved by the Environmental Footprint Institute

MANDATORY STATEMENTS

Explanatory material can be obtained from EPD owner and/or LCA author. Contact information can be found below.

The verifier and The Environmental Footprint Institute do not make any claim or present any responsibility about the legality of the product.

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REFERENCES

This Environmental Footprint has been developed and diffused following the instructions of the Environmental Footprint Institute. Further information and the document itself with reference 170919EFP are available at: (www.environmentalfootprintinstitute.org)

LCA Report: Life Cycle Inventory of steel pipes.

Software: Air.e LCA rev. 3.5.2 (www.solidforest.com)

Main database: Ecoinvent 3.5 (www.ecoinvent.org)

Normative: ISO 14040:2006 "Environmental management -- life cycle assessment -- principles and framework", ISO 14044:2006 "Environmental management -- life cycle assessment -- requirements and guidelines", ISO 14020 "Environmental Labelling: General Principles", ISO 14025:2006 "Environmental labels and declarations -- type III environmental declarations -- principles and procedures" and EN 15804