

Life Cycle Analyses

MESHTAB M



Summary



01 | Methodology



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01

Methodology

Environmental Impact Assessment

Functional unit	The functional unit is a quantified performance of a product system for use as a reference unit. One of the primary purposes of a functional unit is to provide a reference to which the input and output data are normalized (in a mathematical sense). Therefore, the functional unit shall be clearly defined and measurable.
Impact Indicator	The impact is measured through the "IPCC 2021 GWP100" method
Electricity impact calculation method	Following guidelines from the GHG Protocol, the impact of electricity is calculated using the location-based approach. This means that the emission factors used represent the average annual carbon intensity of the power grid in the country the processes take place in.
Life Cycle Analyses	Cradle to grave

Emission Factor Inventory

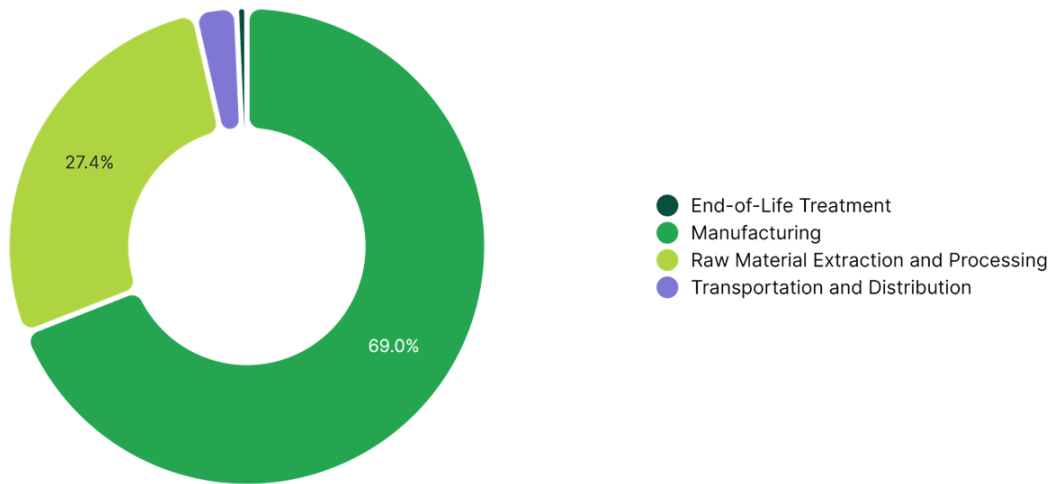
Num	Emission Factor	Source	Value	Unit
1	Steel, low-alloyed Ordinary transforming activity	ECOINVENT 3.10	2.203301567	kg
2	Electricity Total (Scope 2 & 3) People's Republic of China	IEA 2023	0.7231	kWh
3	Freight Boat From CN to FR	WELOW EXPERTS 1.0	0.25227278	kg
4	Waste reinforcement steel Ordinary transforming activity	ECOINVENT 3.10	0.06273427595	kg

02

Results

Pen cup holder

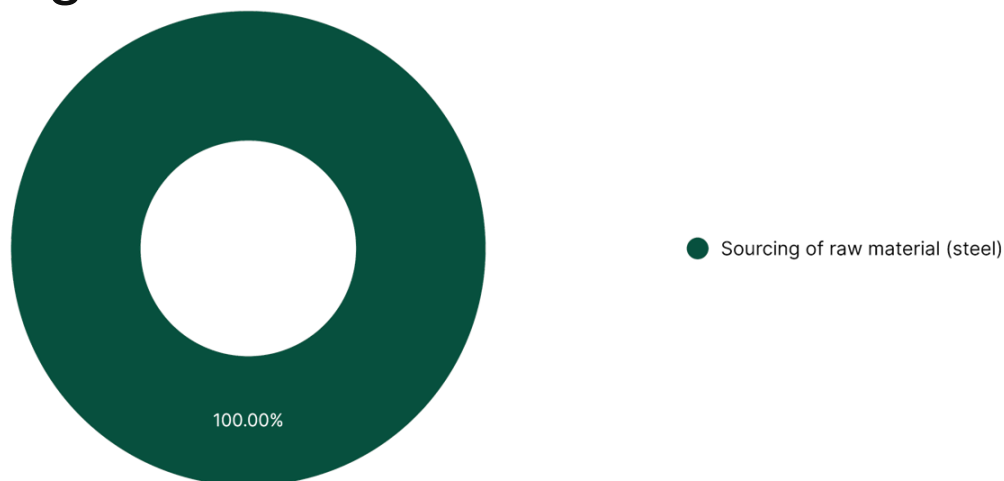
Climate Change



Step	Impact (kg CO ₂ eq)	Percentage (%)
Manufacturing	0.92	69.04 %
Raw Material Extraction and Processing	0.36	27.40 %
Transportation and Distribution	0.04	2.85 %
End-of-Life Treatment	9.41 · 10 ⁻³	0.71 %
TOTAL	1.33	100.00 %

Pen cup holder

Climate Change - Raw Material Extraction and Processing



Activity	Emission Factor Num	Quantity	Unité	Impact (g CO ₂ eq)	Percentage (%)
Sourcing of raw material (steel)	1	0.17	kg	363.54	100.00 %

TOTAL	363.54	100.00 %
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Pen cup holder

Climate Change - Manufacturing



- Electricity usage during material transfo...

Activity	Emission Factor Num	Quantity	Unité	Impact (g CO ₂ eq)	Percentage (%)
Electricity usage during material transformation (steel)	2	1.27	kWh	915.93	100.00 %
TOTAL				915.93	100.00 %

Pen cup holder

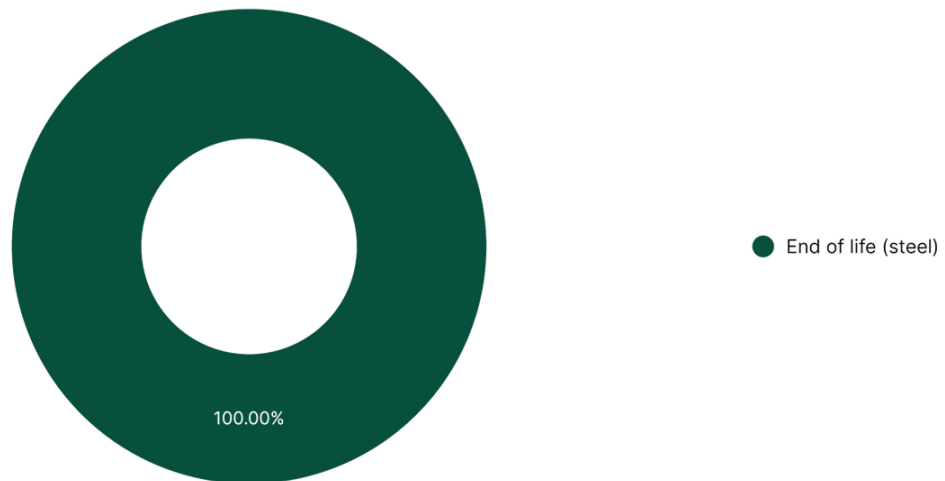
Climate Change - Transportation and Distribution



Activity	Emission Factor Num	Quantity	Unité	Impact (g CO ₂ eq)	Percentage (%)
Freight	3	0.15	kg	37.84	100.00 %
TOTAL				37.84	100.00 %

Pen cup holder

Climate Change - End-of-Life Treatment



Activity	Emission Factor Num	Quantity	Unité	Impact (g CO ₂ eq)	Percentage (%)
End of life (steel)	4	0.15	kg	9.41	100.00 %
TOTAL				9.41	100.00 %

