

Life Cycle Analyses

PMV1MAG



Summary



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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

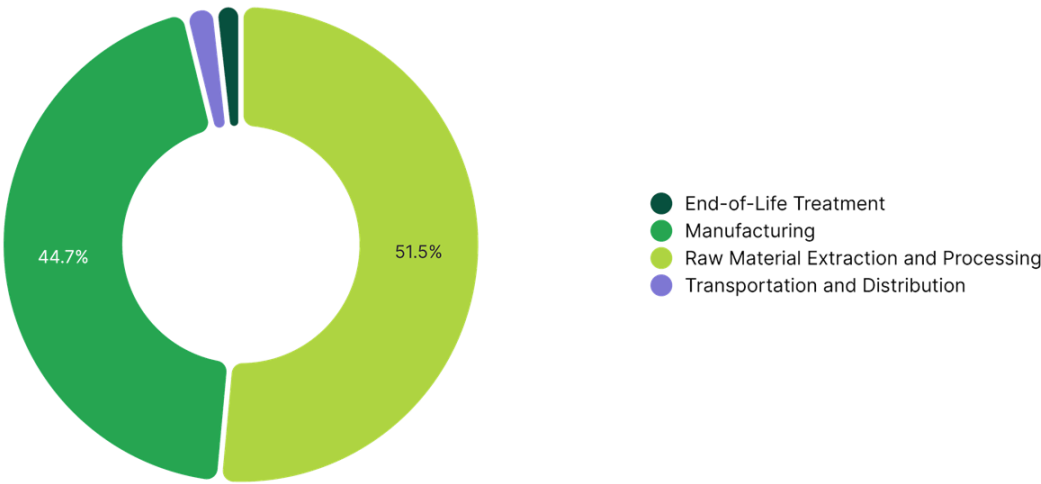
Num	Emission Factor	Source	Value	Unit
1	Steel, low-alloyed Ordinary transforming activity	ECOINVENT 3.10	2.203301567	kg
2	Hardwood lumber 1 inch sustainable forestry 1kg RER	BASE EMPREINTE ADEME 3.0	0.531144	kg
3	Magnet / NdFeB	BASE CARBONE ADEME 22.0	33.5	kg
4	Electricity Total (Scope 2 & 3) People's Republic of China	IEA 2023	0.7231	kWh
5	Freight Boat From CN to FR	WELOW EXPERTS 1.0	0.25227278	kg
6	Tinplate scrap, sorted Ordinary transforming activity	ECOINVENT 3.10	0.03352378077	kg
7	Waste reinforcement steel Ordinary transforming activity	ECOINVENT 3.10	0.06273427595	kg
8	Packaging – Wood – Average end of life in the EPR scheme – Impacts	BASE CARBONE ADEME 22.0	0.269	kg

02

Results

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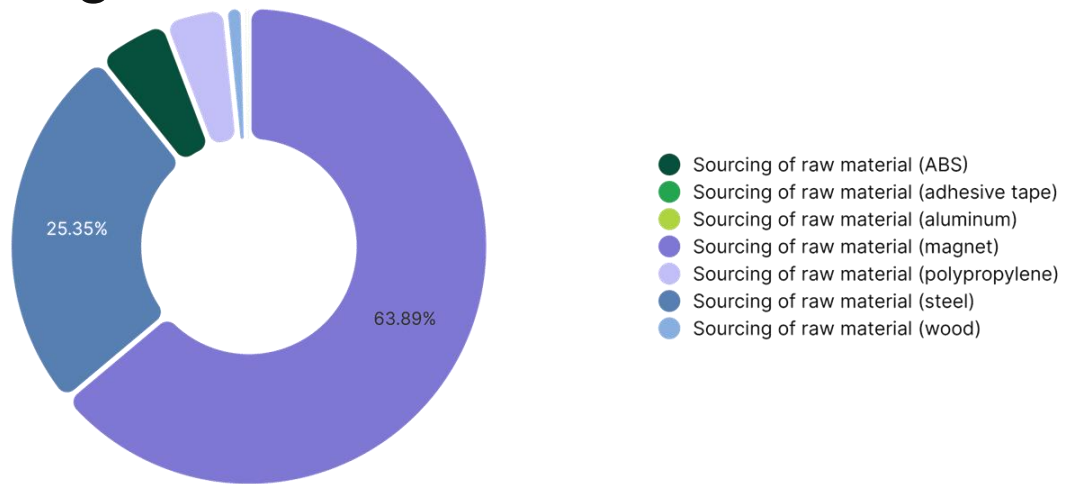
Climate Change



Step	Impact (kg CO ₂ eq)	Percentage (%)
Raw Material Extraction and Processing	8.06	64.48 %
Manufacturing	4.26	34.11 %
Transportation and Distribution	0.14	1.13 %
End-of-Life Treatment	0.04	0.28 %
TOTAL	12,5	100.00 %

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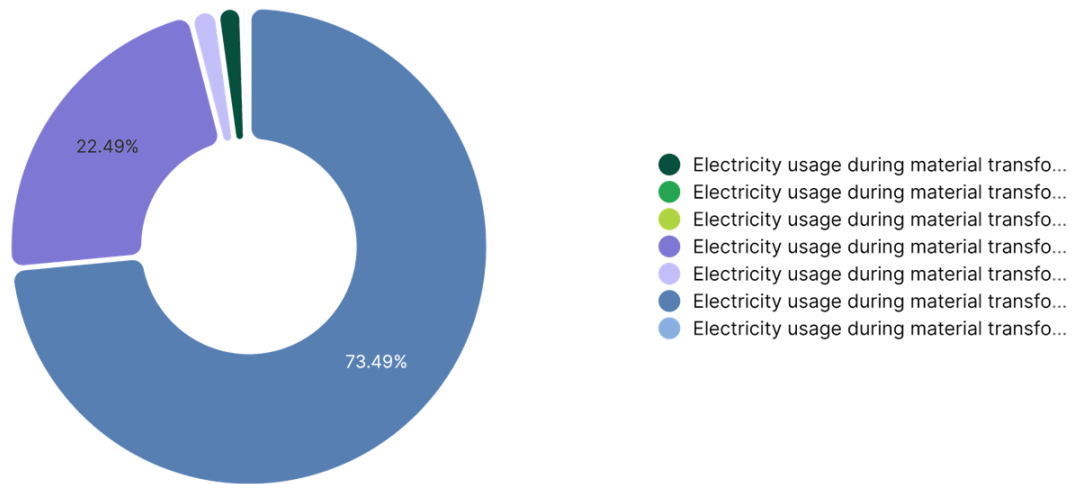
Climate Change - Raw Material Extraction and Processing



Activity	Emission Factor Num	Quantity	Impact (kg CO ₂ eq)	Percentage (%)
Sourcing of raw material (magnet)	3	0.22	7.22	89.61 %
Sourcing of raw material (steel)	1	0.37	0.81	10.10 %
Sourcing of raw material (wood)	2	0.04	0.02	0.29 %
TOTAL			8.06	100.00 %

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Climate Change - Manufacturing



Activity	Emission Factor Num	Quantity	Impact (kg CO ₂ eq)	Percentage (%)
Electricity usage during material transformation (magnet)	4	3.06	2.21	51.81 %
Electricity usage during material transformation (steel)	4	2.84	2.05	48.12 %
Electricity usage during material transformation (wood)	4	$3.95 \cdot 10^{-3}$	$2.86 \cdot 10^{-3}$	0.07 %
TOTAL			4.26	100.00 %

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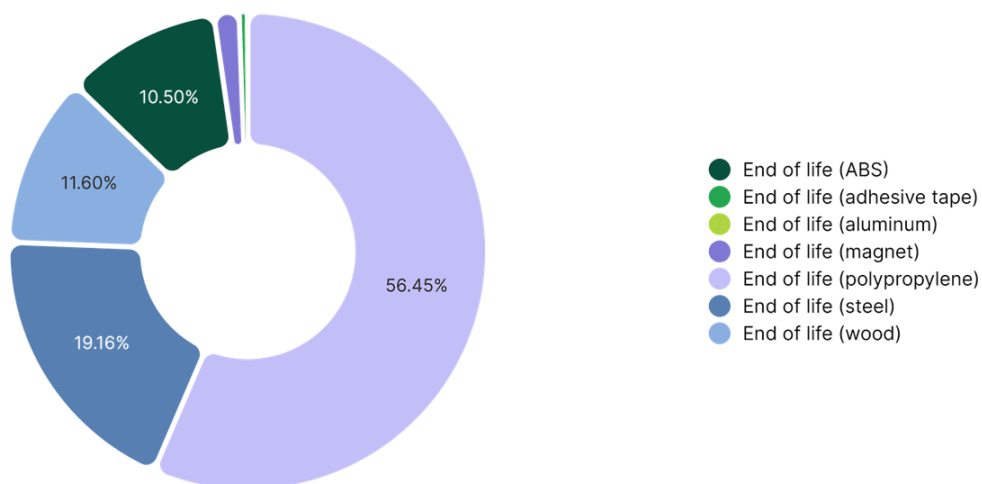
Climate Change - Transportation and Distribution



Activity	Emission Factor Num	Quantity	Impact (g CO ₂ eq)	Percentage (%)
Freight	5	0.56	141.27	100.00 %
TOTAL			141.27	100.00 %

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Climate Change - End-of-Life Treatment



Activity	Emission Factor Num	Quantity	Impact (g CO ₂ eq)	Percentage (%)
End of life (steel)	7	0.34	21.08	59.91 %
End of life (wood)	8	0.03	7.53	21.41 %
End of life (magnet)	6	0.2	6.57	18.68 %
TOTAL			35.18	100.00 %

