

Life Cycle Analyses

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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

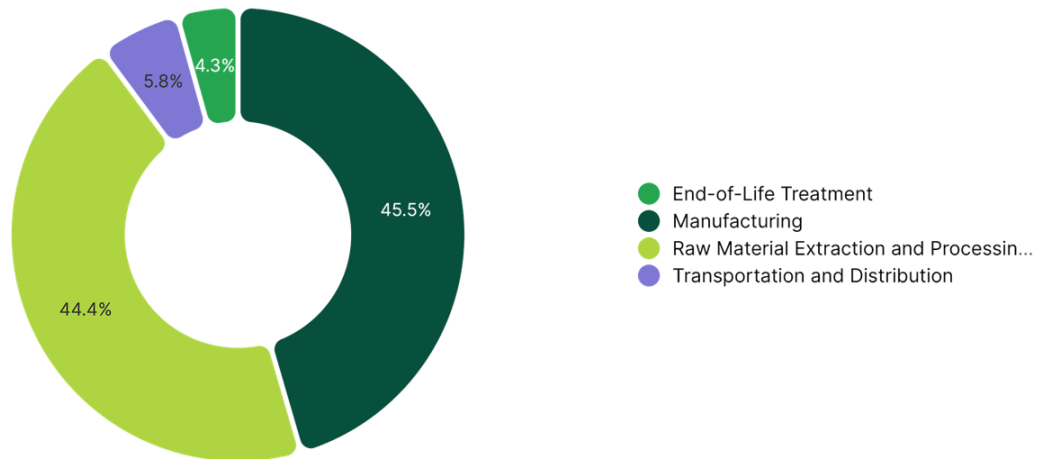
Num	Emission Factor	Source	Value	Unit
1	market for cement, Portland	ECOINVENT 3.10	0.944058408	kg
2	Hardwood lumber 1 inch sustainable forestry 1kg RER	BASE EMPREINTE ADEME 3.0	0.531144	kg
3	Steel, low-alloyed Ordinary transforming activity	ECOINVENT 3.10	2.203301567	kg
4	Acrylonitrile-butadiene-styrene copolymer Ordinary transforming activity	ECOINVENT 3.10	4.533718346	kg
5	Polypropylene, granulate Market activity	ECOINVENT 3.10	3.516196993	kg
6	Electricity Total (Scope 2 & 3) People's Republic of China	IEA 2023	0.7231	kWh
7	Freight Boat From CN to FR	WELOW EXPERTS 1.0	0.25227278	kg
8	treatment of waste cement-fibre slab, dismantled, waste municipal incineration	ECOINVENT 3.10	0.015293826	kg
9	polyethylene/polypropylene product Ordinary	ECOINVENT 3.10	1.783532575	kg
10	Packaging - Wood - Average end of life in the EPR scheme - Impacts	BASE CARBONE ADEME 22.0	0.269	kg
11	Waste reinforcement steel Ordinary transforming activity	ECOINVENT 3.10	0.06273427595	kg
12	Residues, MSWI, waste plastic, consumer electronics Ordinary transforming activity	ECOINVENT 3.10	0.3620299477	kg

02

Results

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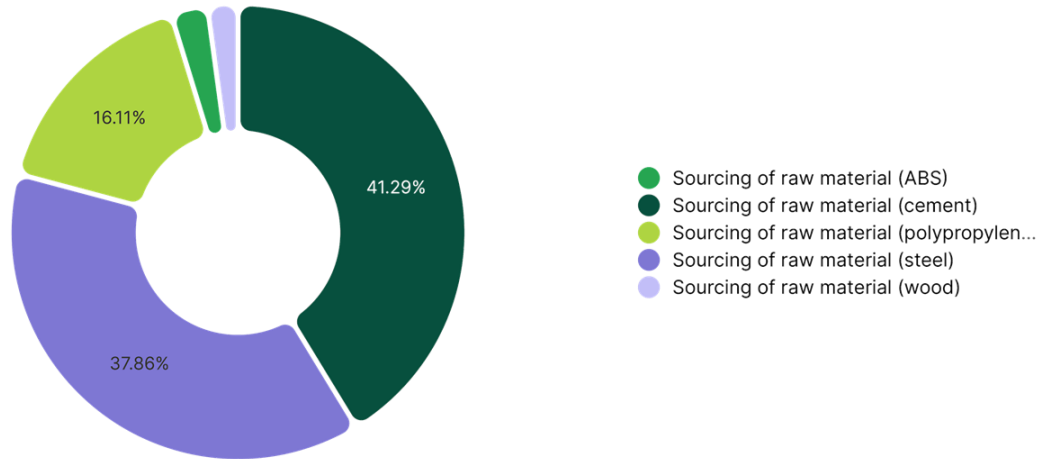
Climate Change



Step	Impact (kg CO ₂ eq)	Percentage (%)
Manufacturing	11.62	45.49 %
Raw Material Extraction and Processing	11.33	44.36 %
Transportation and Distribution	1.49	5.83 %
End-of-Life Treatment	1.1	4.32 %
TOTAL	25,55	100.00 %

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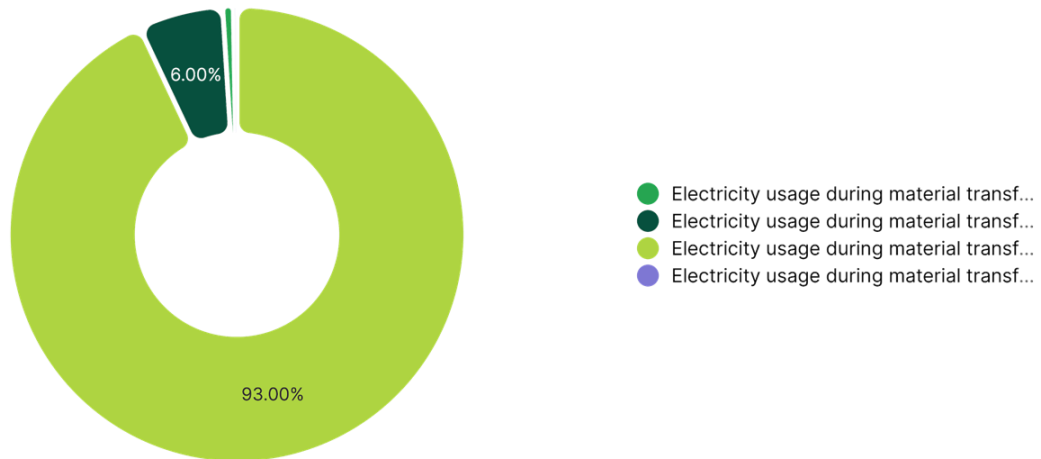
Climate Change - Raw Material Extraction and Processing



Activity	Emission Factor Num	Quantity	Impact (kg CO ₂ eq)	Percentage (%)
Sourcing of raw material (cement)	1	4.96	4.68	41.29 %
Sourcing of raw material (steel)	3	1.95	4.29	37.86 %
Sourcing of raw material (polypropylene)	5	0.52	1.83	16.11 %
Sourcing of raw material (ABS)	4	0.06	0.29	2.60 %
Sourcing of raw material (wood)	2	0.46	0.24	2.14 %
TOTAL			11.33	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 (steel)	6	14.95	10.81	93.00 %
Electricity usage during material transformation (polypropylene)	6	0.96	0.7	6.00 %
Electricity usage during material transformation (ABS)	6	0.12	0.09	0.75 %
Electricity usage during material transformation (wood)	6	0.04	0.03	0.26 %

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TOTAL			11.62	100.00 %
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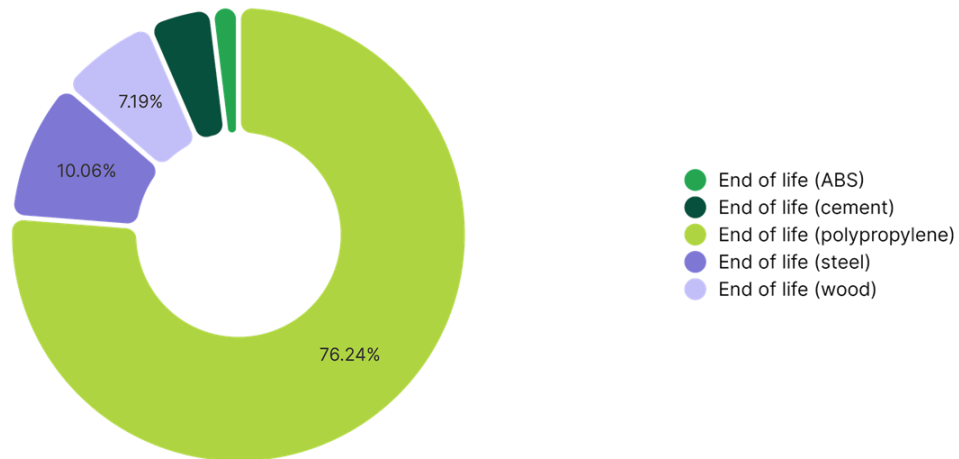
Climate Change - Transportation and Distribution



Activity	Emission Factor Num	Quantity	Impact (kg CO ₂ eq)	Percentage (%)
Freight	7	5.9	1.49	100.00 %
TOTAL			1.49	100.00 %

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Climate Change - End-of-Life Treatment



Activity	Emission Factor Num	Quantity	Impact (kg CO ₂ eq)	Percentage (%)
End of life (polypropylene)	9	0.47	0.84	76.24 %
End of life (steel)	11	1.77	0.11	10.06 %
End of life (wood)	10	0.3	0.08	7.19 %
End of life (cement)	8	3.3	0.05	4.58 %
End of life (ABS)	12	0.06	0.02	1.93 %
TOTAL			1.1	100.00 %

