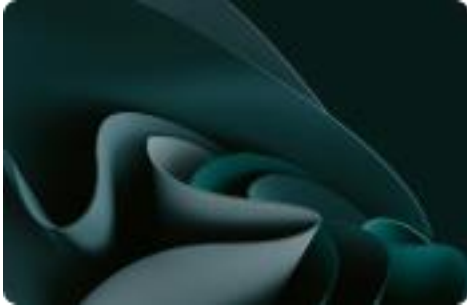


Life Cycle Analyses

PBCART



Summary



01 | Methodology



02 | Results

01

Methodology

Environmental Impact Assessment

<p>Functional unit</p>	<p>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.</p>
<p>Impact Indicator</p>	<p>The impact is measured through the "IPCC 2021 GWP100" method</p>
<p>Electricity impact calculation method</p>	<p>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.</p>
<p>Life Cycle Analyses</p>	<p>Cradle to grave</p>

Emission Factor Inventory

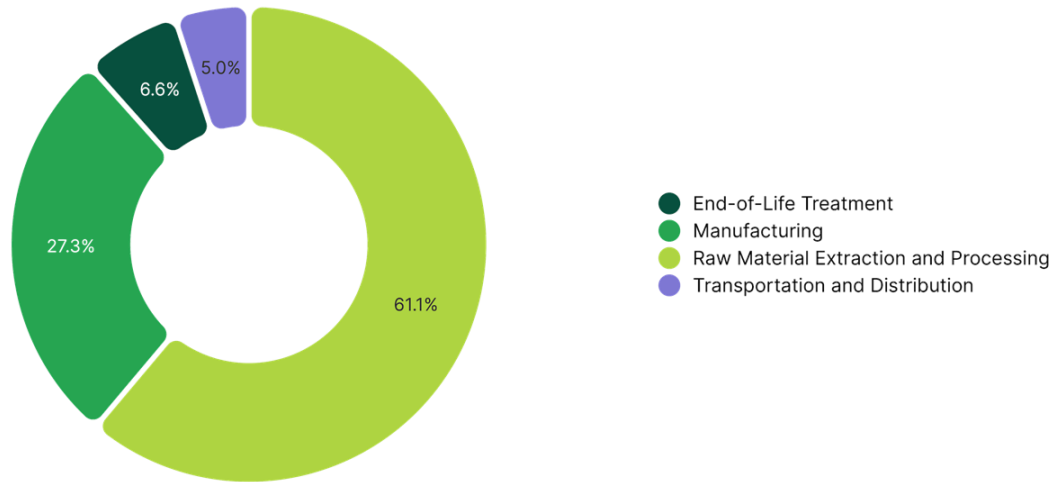
Num	Emission Factor	Source	Value	Unit
1	Carton board box production, with gravure printing Market activity	ECOINVENT 3.10	0.72	kg
2	Acrylonitrile-butadiene-styrene copolymer Ordinary transforming activity	ECOINVENT 3.10	4.53	kg
3	Steel, low-alloyed Ordinary transforming activity	ECOINVENT 3.10	2.20	kg
4	Electricity Total (Scope 2 & 3) People's Republic of China	IEA 2023	0.72	kWh
5	Freight Boat From CN to FR	WELOW EXPERTS 1.0	0.25	kg
6	Residues, MSWI, waste graphical paper Ordinary transforming activity	ECOINVENT 3.10	0.36	kg
7	Waste reinforcement steel Ordinary transforming activity	ECOINVENT 3.10	0.06	kg
8	Residues, MSWI, waste plastic, consumer electronics Ordinary transforming activity	ECOINVENT 3.10	0.36	kg

02

Results

Carboard bins

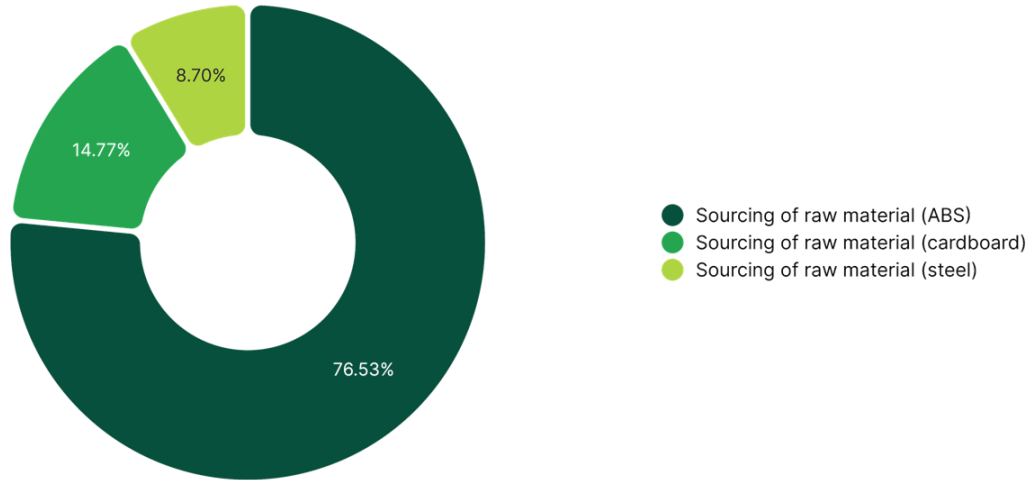
Climate Change



Step	Impact (kg CO ₂ eq)	Percentage (%)
Raw Material Extraction and Processing	4.07	61.14 %
Manufacturing	1.82	27.26 %
End-of-Life Treatment	0.44	6.57 %
Transportation and Distribution	0.34	5.04 %
TOTAL	6.66	100.00 %

Carboard bins

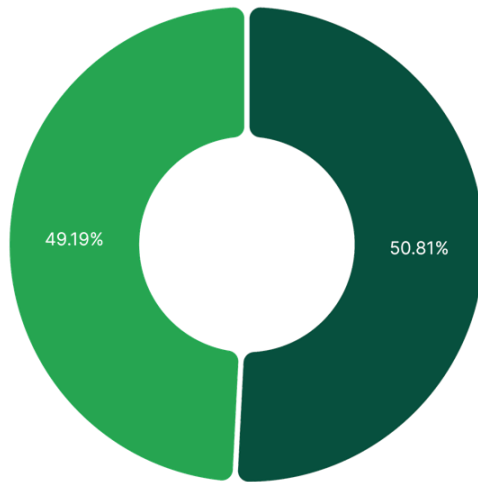
Climate Change - Raw Material Extraction and Processing



Activity	Emission Factor Num	Quantity	Unité	Impact (kg CO ₂ eq)	Percentage (%)
Sourcing of raw material (ABS)	2	0.69	kg	3.12	76.53 %
Sourcing of raw material (cardboard)	1	0.84	kg	0.6	14.77 %
Sourcing of raw material (steel)	3	0.16	kg	0.35	8.70 %
TOTAL				4.07	100.00 %

Carboard bins

Climate Change - Manufacturing



- Electricity usage during material transfo...
- Electricity usage during material transfo...

Activity	Emission Factor Num	Quantity	Unité	Impact (kg CO ₂ eq)	Percentage (%)
Electricity usage during material transformation (ABS)	4	1.28	kWh	0.92	50.81 %
Electricity usage during material transformation (steel)	4	1.24	kWh	0.89	49.19 %

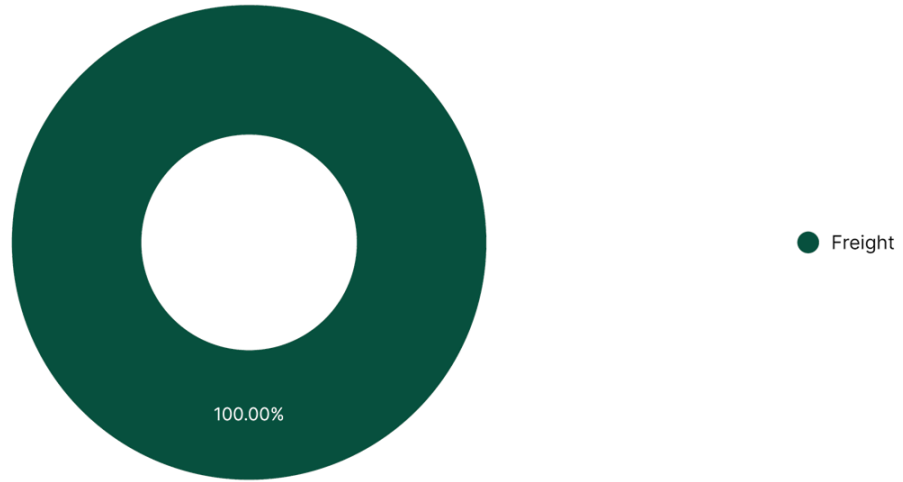
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TOTAL				1.82	100.00 %
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Carboard bins

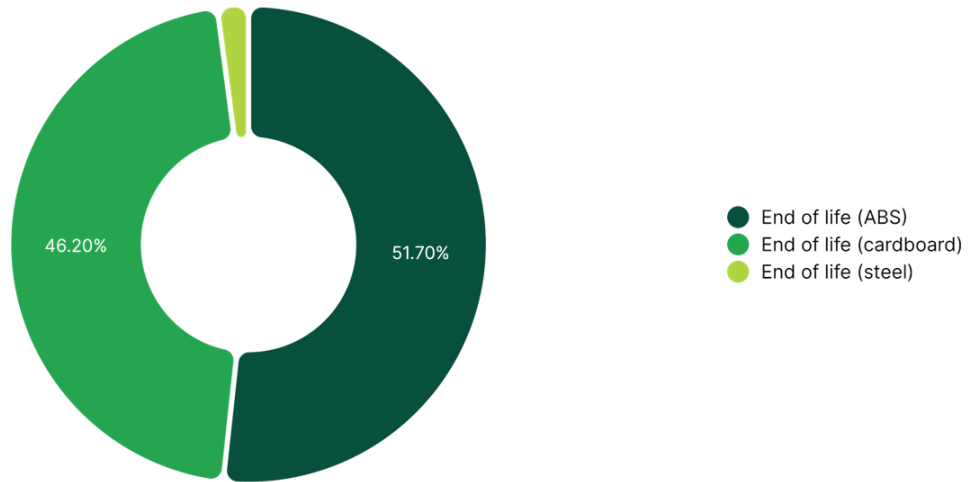
Climate Change - Transportation and Distribution



Activity	Emission Factor Num	Quantity	Unité	Impact (g CO ₂ eq)	Percentage (%)	
Freight	5	1.33	kg	335.52	100.00 %	
TOTAL					335.52	100.00 %

Carboard bins

Climate Change - End-of-Life Treatment



Activity	Emission Factor Num	Quantity	Unité	Impact (g CO ₂ eq)	Percentage (%)
End of life (ABS)	8	0.63	kg	226.3	51.70 %
End of life (cardboard)	6	0.56	kg	202.23	46.20 %
End of life (steel)	7	0.15	kg	9.18	2.10 %
TOTAL				437.71	100.00 %

