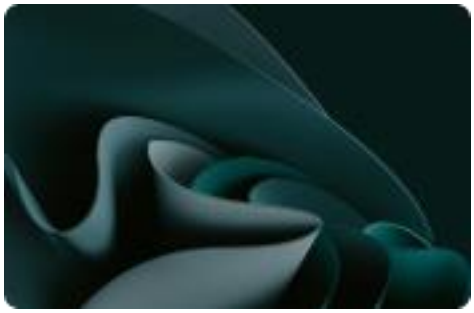
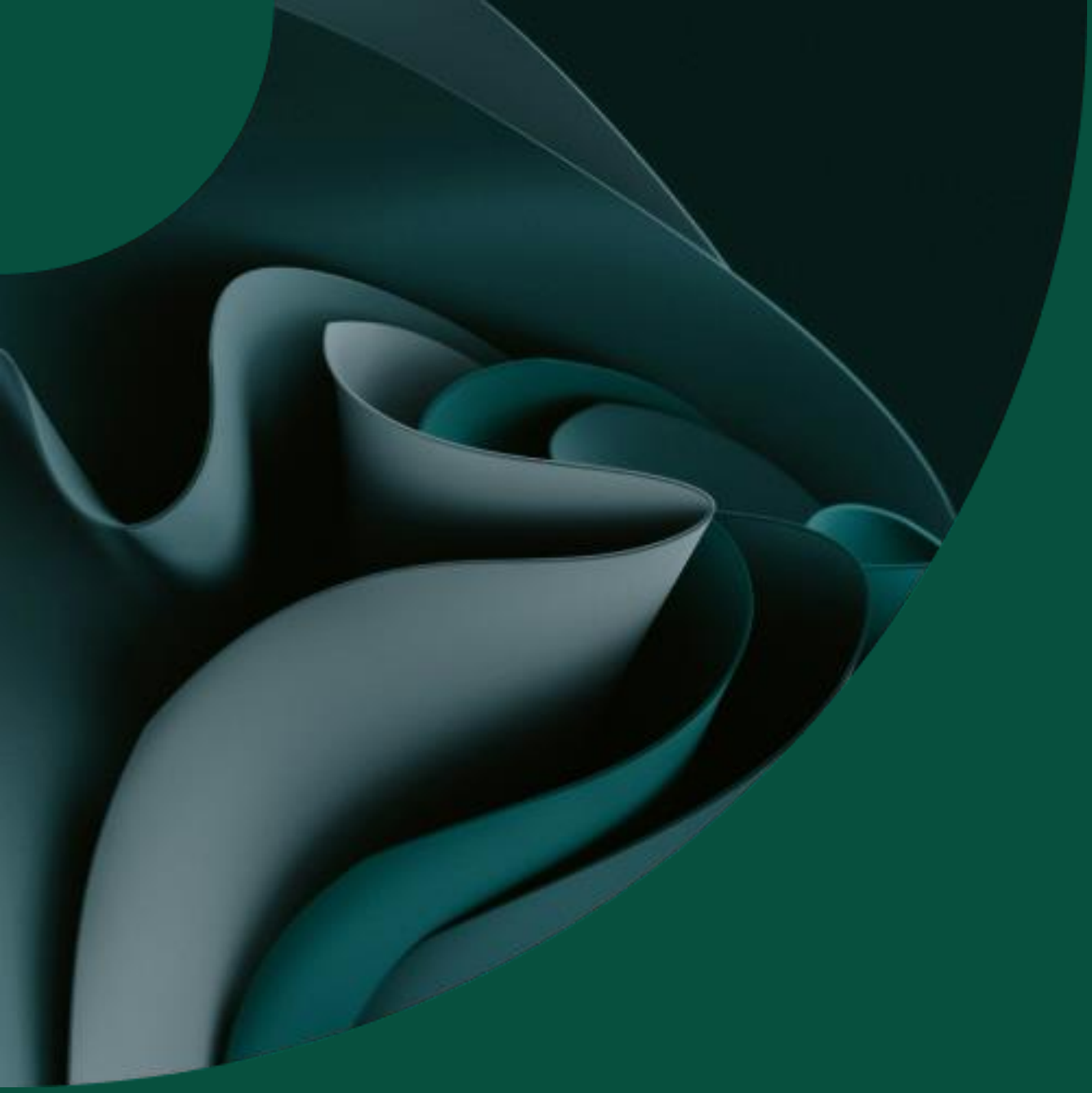
# Life Cycle Analyses

HIZIAP2

# Summary







# 01 Methodology

greenly

# 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 |

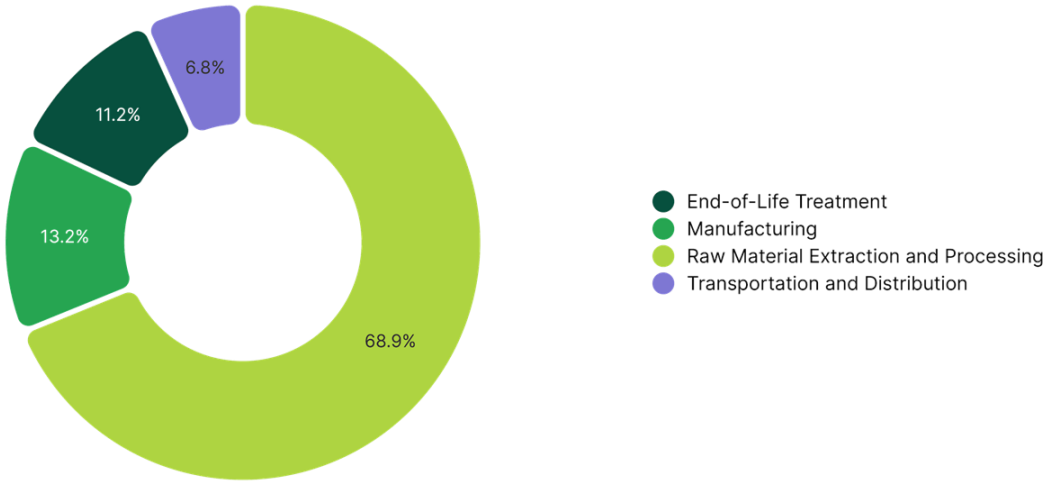
# Emission Factor Inventory

| Num | Emission Factor | Source | Value | Unit |
|---|---|---|---|---|
| 1 | Polyester filament \| finished \| at plant \| 100% polyester | BASE EMPREINTE ADEME 3.0 | 10.0285 | kg |
| 2 | Hardwood lumber \| 1 inch \| sustainable forestry \| 1kg \| RER | BASE EMPREINTE ADEME 3.0 | 0.531144 | kg |
| 3 | Polyurethane, rigid foam \| Ordinary transforming activity | ECOINVENT 3.10 | 4.602684501 | kg |
| 4 | Polyethylene, linear low density, granulate \| Ordinary transforming activity | ECOINVENT 3.10 | 3.073907294 | kg |
| 5 | Steel, chromium steel 18/8 \| Ordinary transforming activity | ECOINVENT 3.10 | 4.730394052 | 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 | Waste yarn and waste textile \| Ordinary transforming activity | ECOINVENT 3.10 | 0.004657246015 | kg |
| 9 | Packaging - Wood - Average end of life in the EPR scheme - Impacts | BASE CARBONE ADEME 22.0 | 0.269 | kg |
| 10 | Waste polyethylene/polypropylene product \| Ordinary transforming activity | ECOINVENT 3.10 | 1.783532575 | kg |
| 11 | Waste reinforcement steel \| Ordinary transforming activity | ECOINVENT 3.10 | 0.06273427595 | kg |

# 02 Results

Modular sofa

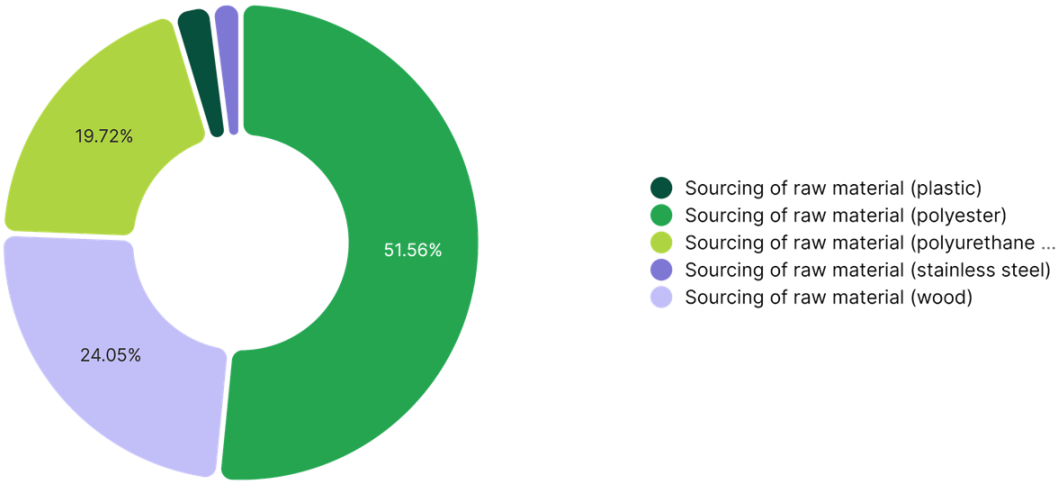
# Climate Change




| Step | Impact (kg $CO_2$ eq) | Percentage (%) |
|---|---|---|
| Raw Material Extraction and Processing | 42.36 | 68.85 % |
| Manufacturing | 8.12 | 13.20 % |
| End-of-Life Treatment | 6.88 | 11.18 % |
| Transportation and Distribution | 4.16 | 6.77 % |
| | | |
| **TOTAL** | **61.52** | **100.00 %** |

Modular sofa

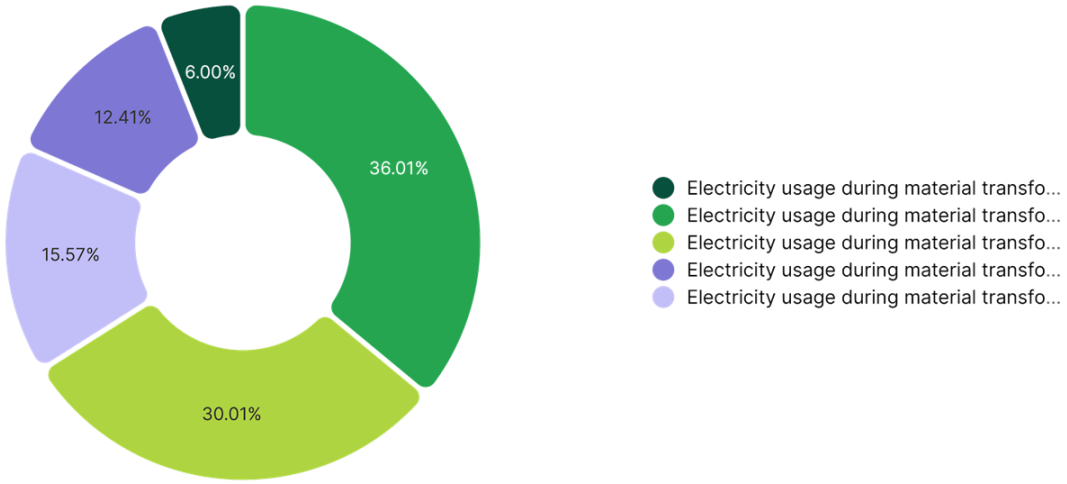
# Climate Change - Raw Material Extraction and Processing




| Activity | Emission Factor Num | Quantity | Impact (kg $CO_2$ eq) | Percentage (%) |
|---|---|---|---|---|
| Sourcing of raw material (polyester) | 1 | 2.18 | 21.84 | 51.56 % |
| Sourcing of raw material (wood) | 2 | 19.18 | 10.19 | 24.05 % |
| Sourcing of raw material (polyurethane foam) | 3 | 1.82 | 8.35 | 19.72 % |
| Sourcing of raw material (plastic) | 4 | 0.36 | 1.12 | 2.63 % |
| Sourcing of raw material (stainless steel) | 5 | 0.18 | 0.86 | 2.03 % |
| | | | | |
| TOTAL | | | 42.36 | 100.00 % |

Modular sofa

# Climate Change - Manufacturing




| Activity | Emission Factor Num | Quantity | Impact (kg $CO_2$ eq) | Percentage (%) |
|---|---|---|---|---|
| Electricity usage during material transformation (polyester) | 6 | 4.04 | 2.92 | 36.01 % |
| Electricity usage during material transformation (polyurethane foam) | 6 | 3.37 | 2.44 | 30.01 % |
| Electricity usage during material transformation (wood) | 6 | 1.75 | 1.26 | 15.57 % |
| Electricity usage during material transformation (stainless steel) | 6 | 1.39 | 1.01 | 12.41 % |
| Electricity usage during material transformation (plastic) | 6 | 0.67 | 0.49 | 6.00 % |
| | | | | |
| TOTAL | | | 8.12 | 100.00 % |

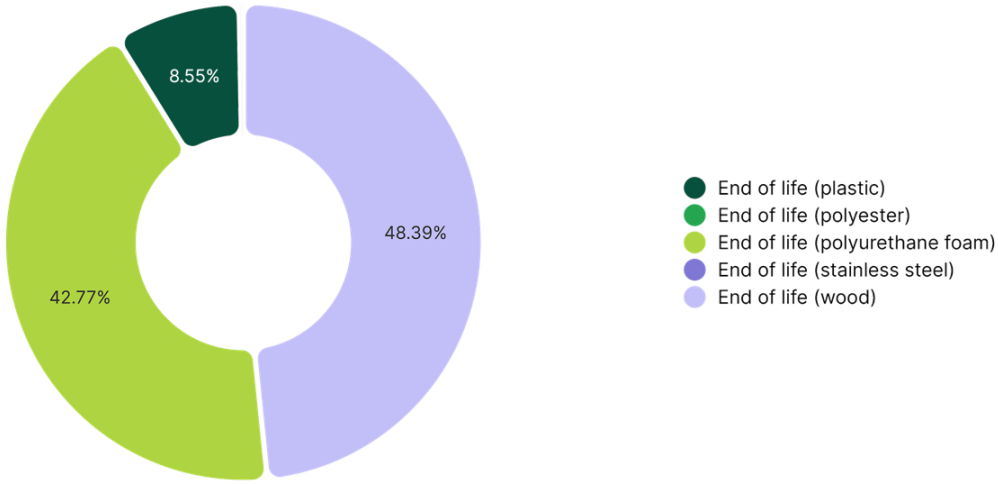
Modular sofa

# Climate Change - Transportation and Distribution


| Activity | Emission Factor Num | Quantity | Impact (kg $CO_2$ eq) | Percentage (%) |
|---|---|---|---|---|
| Freight | 7 | 16.5 | 4.16 | 100.00 % |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| TOTAL | | | 4.16 | 100.00 % |

Modular sofa

# Climate Change - End-of-Life Treatment




| Activity | Emission Factor Num | Quantity | Impact (kg $CO_2$ eq) | Percentage (%) |
|---|---|---|---|---|
| End of life (wood) | 9 | 12.38 | 3.33 | 48.39 % |
| End of life (polyurethane foam) | 10 | 1.65 | 2.94 | 42.77 % |
| End of life (plastic) | 10 | 0.33 | 0.59 | 8.55 % |
| End of life (stainless steel) | 11 | 0.17 | 0.01 | 0.15 % |
| End of life (polyester) | 8 | 1.98 | 9.22 · 10^-3 | 0.13 % |
| | | | | |
| TOTAL | | | 6.88 | 100.00 % |


ALBA