



2025-09-17

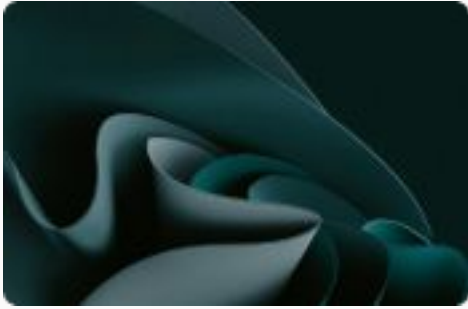
Lyreco LCA

# Life Cycle Assessment

*The methodology in this report is based on ISO 14040*

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# Summary



## 01 | Methodology



## 02 | Results

# 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).  
The functional unit of this analysis is "1 set(s) of bound pages of paper for the purpose of writing".

## Impact Indicator

The impact is measured through the "IPCC 2013 GWP 100a" 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.

## Hypothesis

# Environmental Impact Assessment

## System Boundaries

The scope of this research includes the complete lifecycle of a notebook from raw material extraction to disposal options for each material, which is the cradle-to-grave perspective.

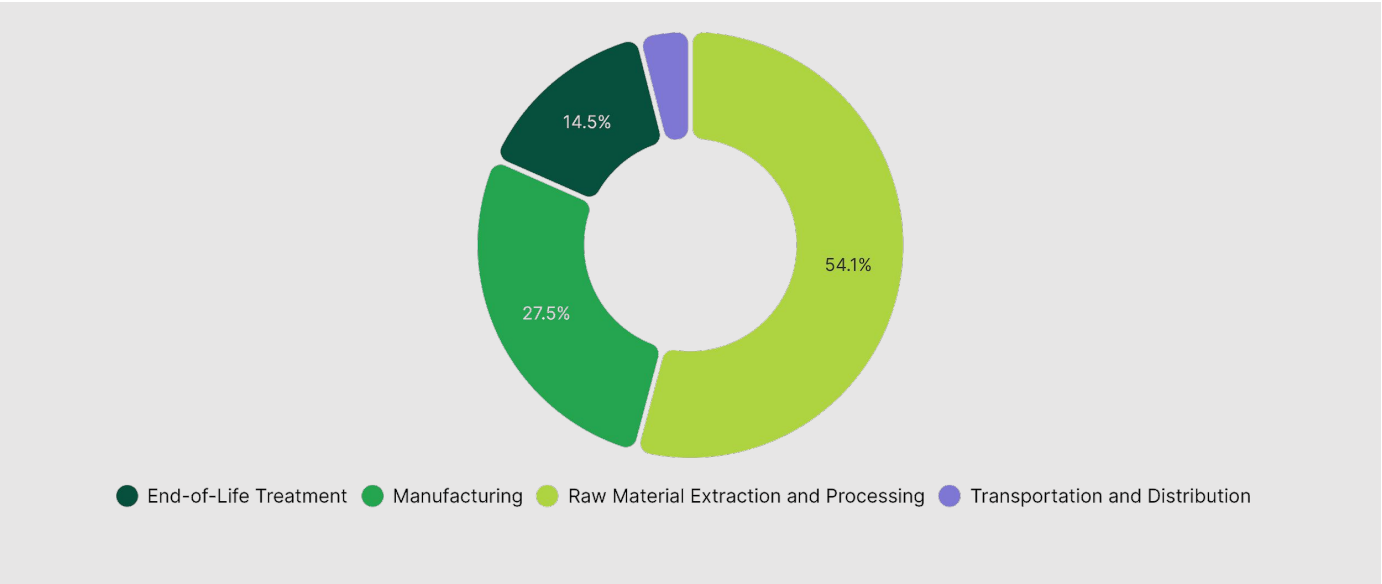
## Exclusions

The impact of secondary packaging and writing utensils are excluded from this assessment.

# 02

## Results

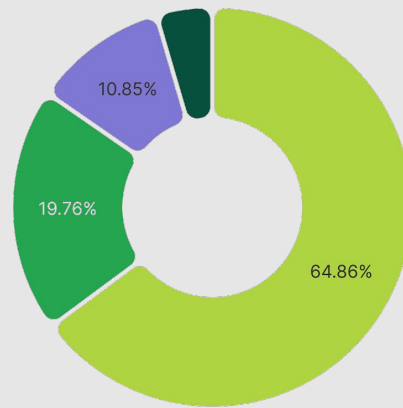
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 Climate Change



| Step                                   | Impact<br>(kg CO <sub>2</sub> eq) | Percentage<br>(%) |
|----------------------------------------|-----------------------------------|-------------------|
| Raw Material Extraction and Processing | 0.93                              | 54.13 %           |
| Manufacturing                          | 0.47                              | 27.48 %           |
| End-of-Life Treatment                  | 0.25                              | 14.45 %           |
| Transportation and Distribution        | 0.07                              | 3.94 %            |
|                                        |                                   |                   |
| TOTAL                                  | 1.71                              | 100.00 %          |

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# Climate Change - Raw Material Extraction and Processing



● Sourcing of raw material (adhesive)
 ● Sourcing of raw material (bleached kraft paper)
 ● Sourcing of raw material (polyurethane fiber)
 ● Sourcing of raw material (synthetic rubber)

| Activity                                        | Emission Factor Num | Quantity            | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|-------------------------------------------------|---------------------|---------------------|-------------------------------|----------------|
| Sourcing of raw material (polyurethane fiber)   | 2                   | 0.09                | 600.6                         | 64.86 %        |
| Sourcing of raw material (bleached kraft paper) | 1                   | 0.37                | 182.94                        | 19.76 %        |
| Sourcing of raw material (synthetic rubber)     | 4                   | 0.04                | 100.47                        | 10.85 %        |
| Sourcing of raw material (adhesive)             | 3                   | $7.7 \cdot 10^{-3}$ | 41.96                         | 4.53 %         |

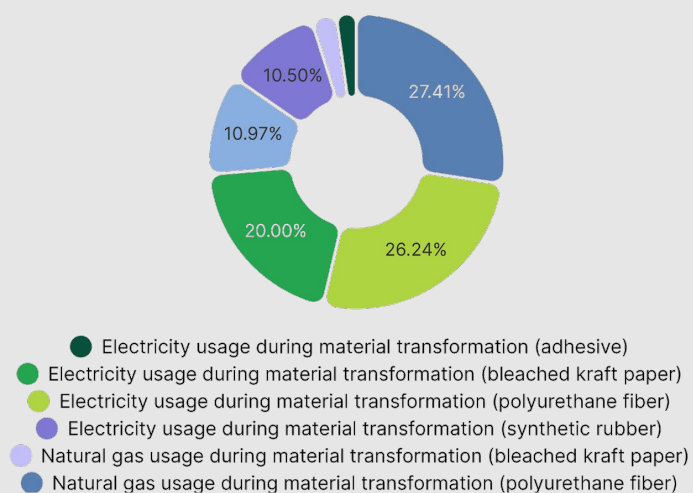
TOTAL

925.96

100.00 %

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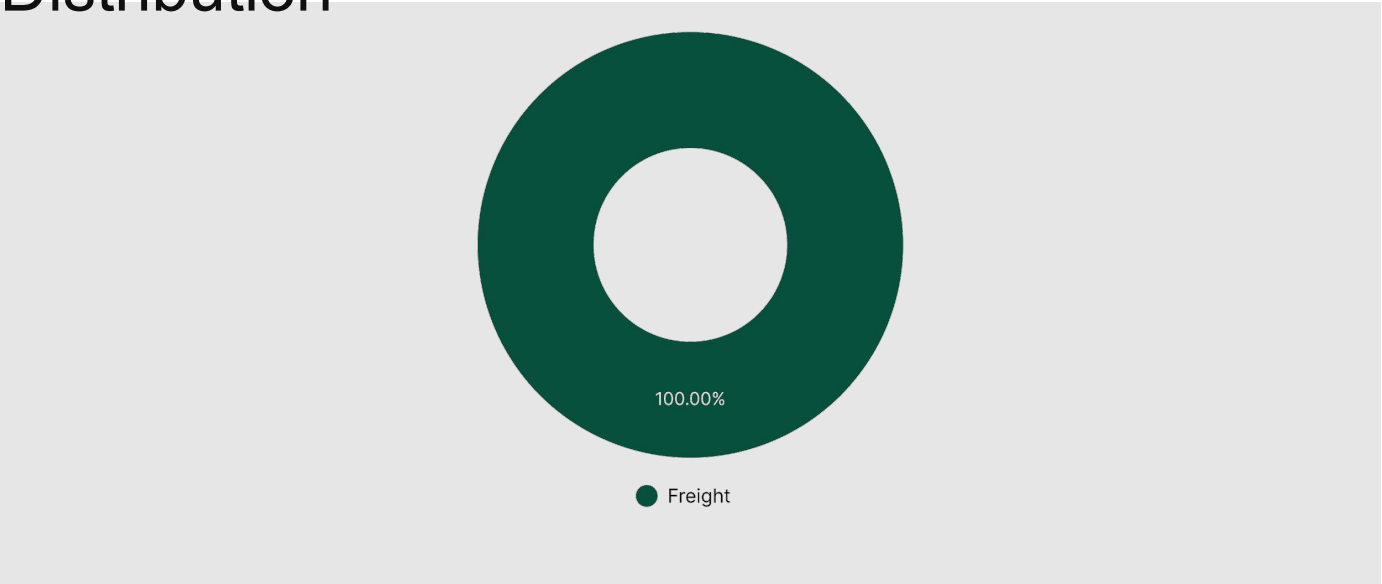
## Climate Change - Manufacturing



| Activity                                                                | Emission Factor Num | Quantity | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|-------------------------------------------------------------------------|---------------------|----------|-------------------------------|----------------|
| Natural gas usage during material transformation (polyurethane fiber)   | 6                   | 0.71     | 128.85                        | 27.41 %        |
| Electricity usage during material transformation (polyurethane fiber)   | 5                   | 0.17     | 123.33                        | 26.24 %        |
| Electricity usage during material transformation (bleached kraft paper) | 5                   | 0.13     | 94                            | 20.00 %        |
| Natural gas usage during material transformation (synthetic rubber)     | 6                   | 0.28     | 51.54                         | 10.97 %        |
| Electricity usage during material transformation (synthetic rubber)     | 5                   | 0.07     | 49.33                         | 10.50 %        |
| Natural gas usage during material transformation (bleached kraft paper) | 6                   | 0.07     | 12.64                         | 2.69 %         |
| Electricity usage during material transformation (adhesive)             | 5                   | 0.01     | 10.33                         | 2.20 %         |
| TOTAL                                                                   |                     |          | 470.02                        | 100.00 %       |

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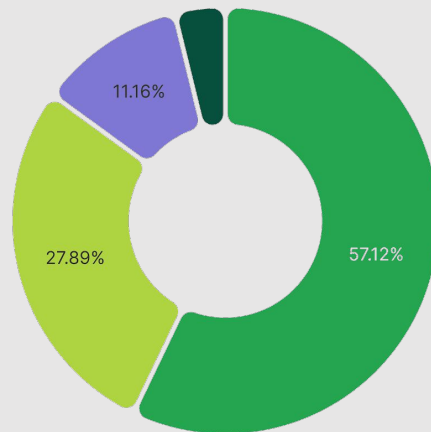
# Climate Change - Transportation and Distribution



| Activity | Emission Factor Num | Quantity | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|----------|---------------------|----------|-------------------------------|----------------|
| Freight  | 7                   | 0.35     | 67.33                         | 100.00 %       |
|          |                     |          |                               |                |
|          |                     |          |                               |                |
|          |                     |          |                               |                |
|          |                     |          |                               |                |
| TOTAL    |                     |          | 67.33                         | 100.00 %       |

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## Climate Change - End-of-Life Treatment



● End of life (adhesive)
 ● End of life (bleached kraft paper)
 ● End of life (polyurethane fiber)

| Activity                           | Emission Factor Num | Quantity             | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|------------------------------------|---------------------|----------------------|-------------------------------|----------------|
| End of life (bleached kraft paper) | 9                   | 0.25                 | 141.23                        | 57.12 %        |
| End of life (polyurethane fiber)   | 8                   | 0.07                 | 68.96                         | 27.89 %        |
| End of life (synthetic rubber)     | 8                   | 0.03                 | 27.58                         | 11.16 %        |
| End of life (adhesive)             | 10                  | $6.99 \cdot 10^{-3}$ | 9.47                          | 3.83 %         |

TOTAL

247.24

100.00 %

# Contact us

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[www.greenly.earth](http://www.greenly.earth)