



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.

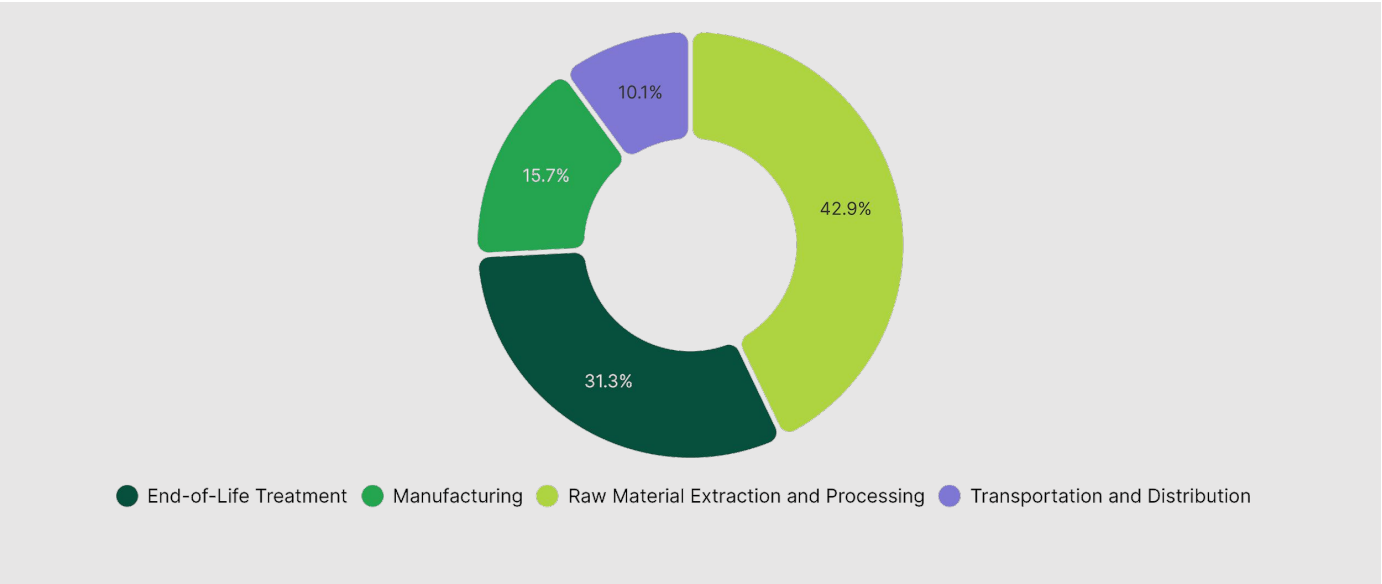
## Exclusions

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

# 02

## Results

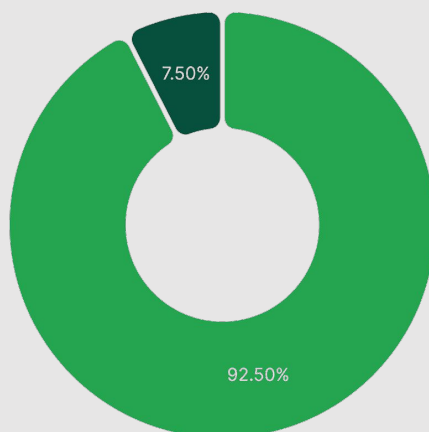
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 Climate Change



| Step                                   | Impact<br>(g CO <sub>2</sub> eq) | Percentage<br>(%) |
|----------------------------------------|----------------------------------|-------------------|
| Raw Material Extraction and Processing | 64.36                            | 42.88 %           |
| End-of-Life Treatment                  | 47.05                            | 31.35 %           |
| Manufacturing                          | 23.53                            | 15.68 %           |
| Transportation and Distribution        | 15.16                            | 10.10 %           |
|                                        |                                  |                   |
| TOTAL                                  | 150.1                            | 100.00 %          |

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# Climate Change - Raw Material Extraction and Processing



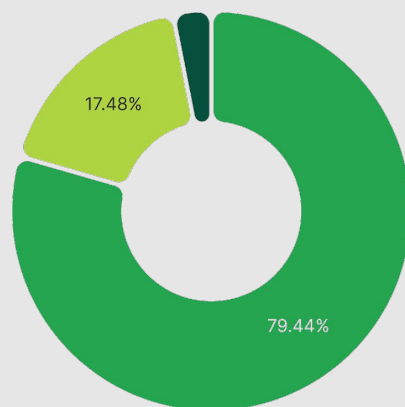
● Sourcing of raw material (adhesive) ● Sourcing of raw material (bleached kraft paper)

| Activity                                        | Emission Factor Num | Quantity                | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|-------------------------------------------------|---------------------|-------------------------|-------------------------------|----------------|
| Sourcing of raw material (bleached kraft paper) | 1                   | 0.12                    | 59.53                         | 92.50 %        |
| Sourcing of raw material (adhesive)             | 2                   | 8.85 · 10 <sup>-4</sup> | 4.83                          | 7.50 %         |

|       |       |          |
|-------|-------|----------|
| TOTAL | 64.36 | 100.00 % |
|-------|-------|----------|

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# Climate Change - Manufacturing



- Electricity usage during material transformation (adhesive)
- Electricity usage during material transformation (bleached kraft paper)

| Activity                                                                | Emission Factor Num | Quantity             | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|-------------------------------------------------------------------------|---------------------|----------------------|-------------------------------|----------------|
| Electricity usage during material transformation (bleached kraft paper) | 3                   | 0.04                 | 18.69                         | 79.44 %        |
| Natural gas usage during material transformation (bleached kraft paper) | 4                   | 0.02                 | 4.11                          | 17.48 %        |
| Electricity usage during material transformation (adhesive)             | 3                   | $1.64 \cdot 10^{-3}$ | 0.73                          | 3.09 %         |
|                                                                         |                     |                      |                               |                |
|                                                                         |                     |                      |                               |                |
|                                                                         |                     |                      |                               |                |
| TOTAL                                                                   |                     |                      | 23.53                         | 100.00 %       |

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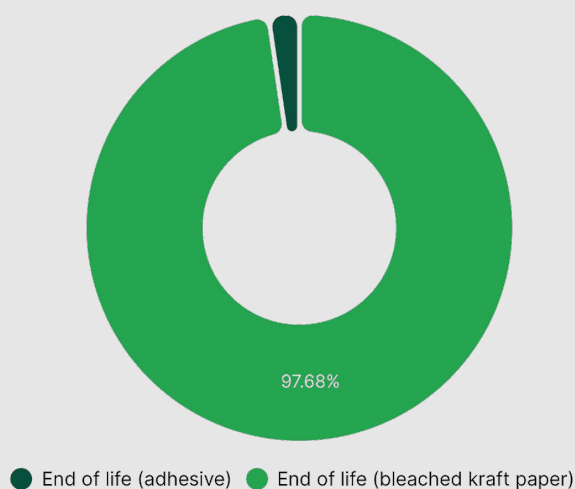
# Climate Change - Transportation and Distribution



| Activity | Emission Factor Num | Quantity | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|----------|---------------------|----------|-------------------------------|----------------|
| Freight  | 5                   | 0.08     | 15.16                         | 100.00 %       |
|          |                     |          |                               |                |
|          |                     |          |                               |                |
|          |                     |          |                               |                |
|          |                     |          |                               |                |
| TOTAL    |                     |          | 15.16                         | 100.00 %       |

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# Climate Change - End-of-Life Treatment



| Activity                           | Emission Factor Num | Quantity             | Impact (g CO <sub>2</sub> eq) | Percentage (%) |
|------------------------------------|---------------------|----------------------|-------------------------------|----------------|
| End of life (bleached kraft paper) | 7                   | 0.08                 | 45.96                         | 97.68 %        |
| End of life (adhesive)             | 6                   | $8.05 \cdot 10^{-4}$ | 1.09                          | 2.32 %         |

|       |       |          |
|-------|-------|----------|
| TOTAL | 47.05 | 100.00 % |
|-------|-------|----------|

# Contact us

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