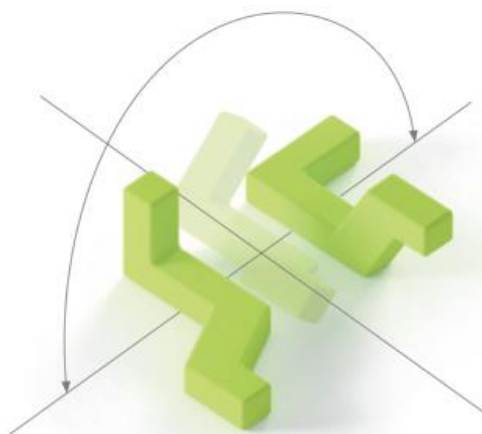


# LCA-Screening and comparison of four different scenarios for: **#139 BOA**

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## **Out-Sider**



### ***Verified and Reported by:***

Pablo Villaizan Marin, MSc, Engineering – MÅLBAR

Morten Gulbrant Sørensen, MSc, Engineering – MÅLBAR

***Not a 3<sup>rd</sup> party verification***

# DISCLAIMER

## Standard for calculation

The climate footprints are calculated according to EUs rules for Product Environmental Footprint (PEF). When data was not available from the brand owner, conservative estimates has been applied. All phases of the product lifecycle are included in the calculation. For the phases after factory-gate; Use

Phase and Disposal conservative estimates are applied, build from the PEF rules. Specifically, the Disposal part is calculated based on an EU average. Målbar only reports on Climate Impact.

The data sources behind these calculations are **EcolInvent 3.8** and **EF 3.0 PEF** data as well as **PEF-compliant LCA data**. (read more here: [www.maalbar.dk/transparency/](http://www.maalbar.dk/transparency/))

## Method of data application

The report results are generated using the MÅLBAR Climate Analysis Tool, where is imputed data provided by the brand owner through the questionnaires used and information gleaned from additional questions asked during the data quality assessment.

## Communication of results

The results in this report are not intended for communication towards the private consumer but only for Professional customers. As of today date, we are awaiting clear instructions from the Consumer Protection Authorities within Europe, until these are clarified Målbar does not recommend for this report be used for communication with the private customer.

## Responsibility of data

It is the sole responsibility of the Brand Owner concerning all Input data (including Material weights, Packaging weight, and dimensions, Origins of production, origins of the material, Transport information, and Warehouse and Retail information). With the verification of this report, Målbar has manually controlled these data towards the normal field of data for this product type and questioned the Brand Owner for outliers before completing it.

## Validity of report

The results of this report are valid for 1 year from the verification date.

## Software version

v. 2.9612

# STUDY RESULTS - Overview



Product Name	Base Case 100% Virgin PE	Scenario 1 100% R-PE	Scenario 2 50% PE – 50% R-PE	Scenario 3 100% Bio- PE
#139 BOA	292 kg CO2e	260 kg CO2e	276 kg CO2e	283 kg CO2e
		-10,9%	-5,5%	-3,1%

Base Case: Use of 100% Virgin PE

Scenario 1: Use of 100% recycled plastic (85% Post-Industrial R-PE and 15% Post-Consumer R-PE)

Scenario 2: Use of 50% recycled plastic (Post-Industrial R-PE) and 50% virgin plastic (PE)

Scenario 3: Use of 100% bioplastics (Bio-PE) from Brazilian sugar cane surplus.

The chemical factory of these plastics in all cases is Poliplas, located in Italia and the production of the components is carried out in Denmark.

The final products are produced by rotational molding.

- The table above shows the results of the LCA screenings for #139 BOA in each of the scenarios. The results are presented in kgCO2 equivalent .
- In addition, a comparison between scenarios on the base case (Savings) is also presented where the relative impact of each proposal can be observed.
- These results are those related to the impact during the whole life cycle of the complete product (not only the part belonging to the plastic rotational molding), considering all the components of each product and steps from the extraction and generation of the materials of which it is composed to the disposal of the final product (Cradle-to-grave), going through each subsequent stage of manufacturing, production waste, packaging, transportation and product use.

# #139 BOA - 100 Virgin PE

## The total estimated climate emission

**292 kg CO2eq**

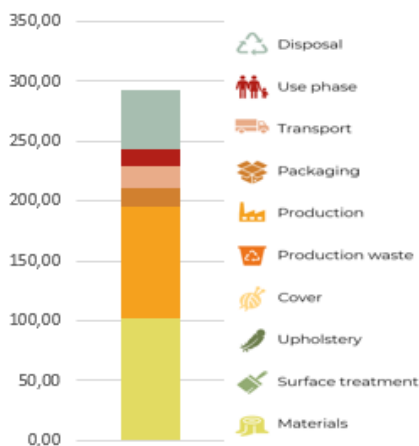
Potential impact of missing data

Best Case: 290 kg CO2eq

Worst Case: 292 kg CO2eq

## Climate emissions of final product

The complete LCA-screening (cradle-to-grave) of your product can be seen below. The total emissions with a range reflecting the uncertainty of data, based on inputs. All life-cycle-stages have been presented individually and their contribution can be seen in the column. Furthermore, a comparison of reliable goods or activities have been presented correlating with the total climate emission of the product.



**Total climate impact**  
**290**  
KG CO2-e

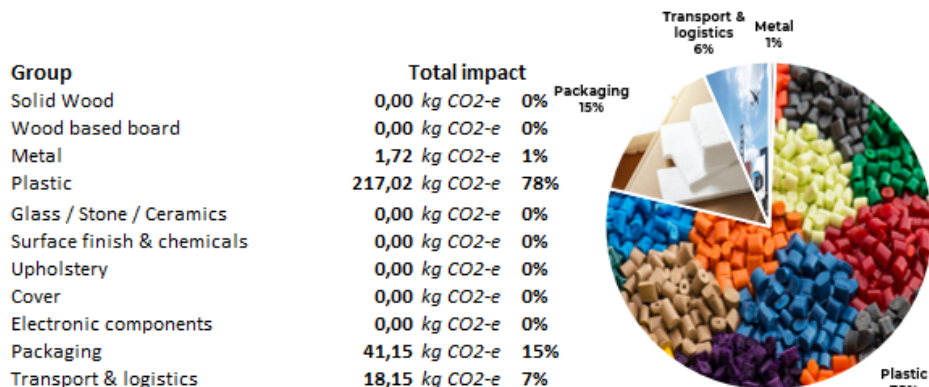
*This Climate emission is the approximate equivalent of:*

**Average Car**  
  
**1351**  
Kilometres

**Red steak**  
  
**27**  
Pos 300 gram red steak

## Material group emissions\*

Presented below are the different material groups in the product and their estimated contribution. Included are all upstream transportation and processes on the materials along with production, production waste and waste scenarios, in order to better understand which material group contributes the most in the product.



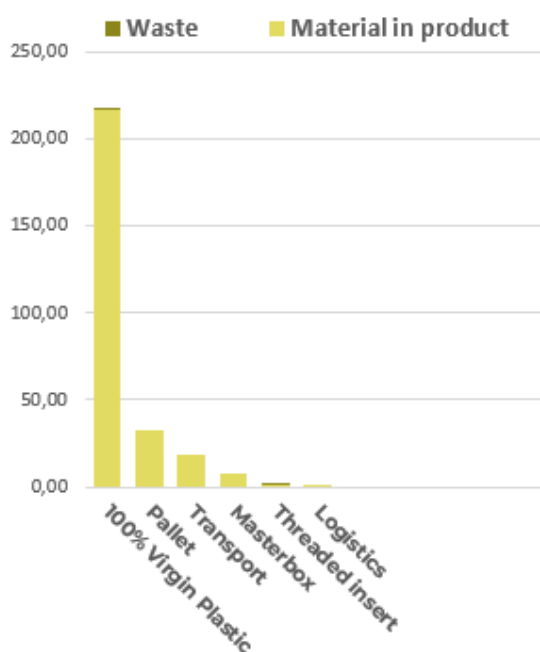
*\*) The values presented here, is total emission pr material group (incl. material, production, material-transport and waste,)*

# #139 BOA – 100% Virgin PE

## Specific material element emissions\*

Below is an overview of the emission of the most emitting elements in the product. Each element is visually divided between the emission from the amount of material in the product and its associated waste-emission. Included are the material and production waste with production processes, transportation and disposal scenarios. This gives an overview of each specific material versus waste.

Element	Total impact
100% Virgin Plastic	217,02 kg CO2-e
Pallet	33,17 kg CO2-e
Transport	18,09 kg CO2-e
Masterbox	7,97 kg CO2-e
Threaded insert	1,72 kg CO2-e
Logistics	0,06 kg CO2-e

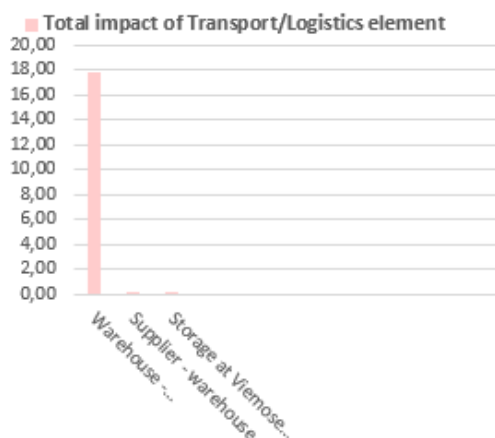


\*) The values presented here, is total emission pr element (incl. Material, production, transport, Waste)

## Transport emissions of final product\*

Product transportation can be seen below, divided into the different transport legs, correlating with the route of the final product.

Element	Total impact
Warehouse - Customer	17,86 kg CO2-e
Supplier - warehouse	0,23 kg CO2-e
Storage at Viemose gad	0,06 kg CO2-e



# #139 BOA – 100% R-PE

## The total estimated climate emission

**260 kg CO2eq**

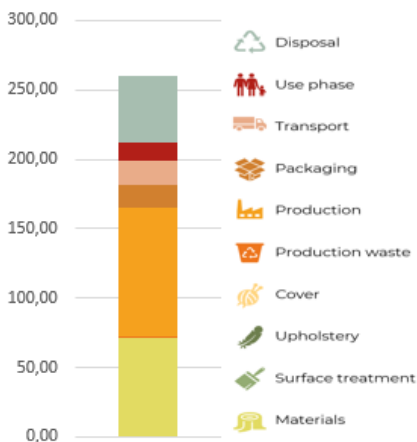
Potential impact of missing data

Best Case: 260 kg CO2eq

Worst Case: 260 kg CO2eq

## Climate emissions of final product

The complete LCA-screening (cradle-to-grave) of your product can be seen below. The total emissions with a range reflecting the uncertainty of data, based on inputs. All life-cycle-stages have been presented individually and their contribution can be seen in the column. Furthermore, a comparison of relatable goods or activates have been presented correlating with the total climate emission of the product.



**Total climate impact**  
**260**  
KG CO2-e

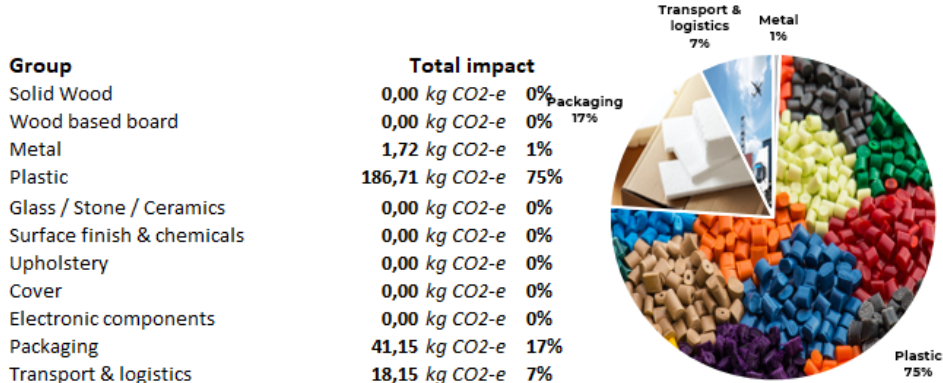
*This Climate emission is the approximate equivalent of:*

**Average Car**  
  
**1204**  
Kilometres

**Red steak**  
  
**24**  
Pcs 300 gram red steak

## Material group emissions\*

Presented below are the different material groups in the product and their estimated contribution. Included are all upstream transportation and processes on the materials along with production, production waste and waste scenarios, in order to better understand which material group contributes the most in the product.

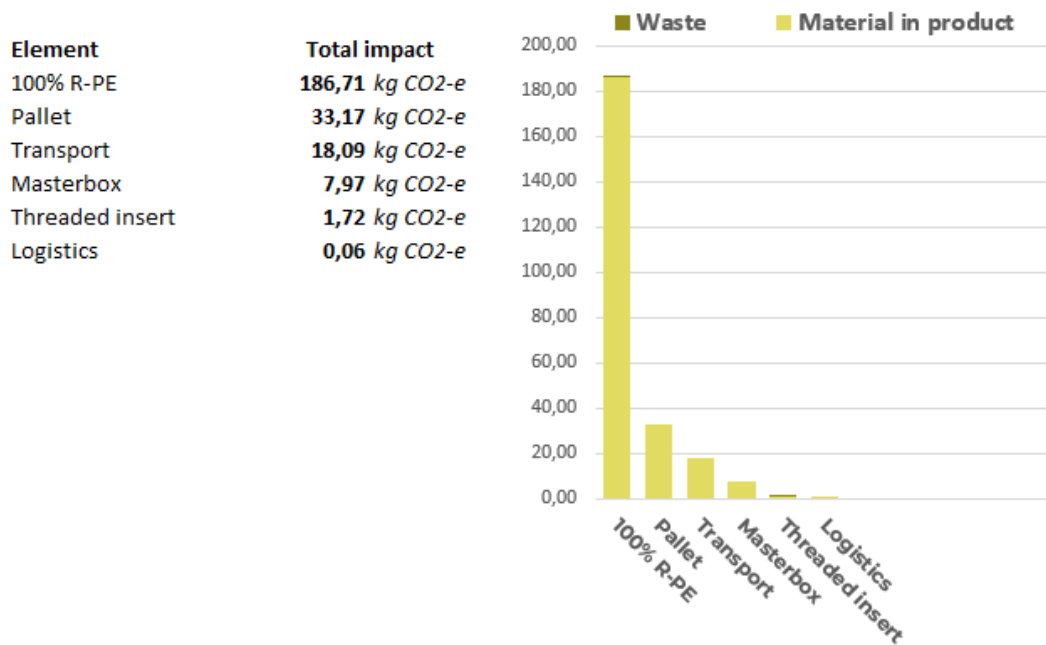


*\*) The values presented here, is total emission pr material group (incl. material, production, material-transport and waste,)*

# #139 BOA – 100% R-PE

## Specific material element emissions\*

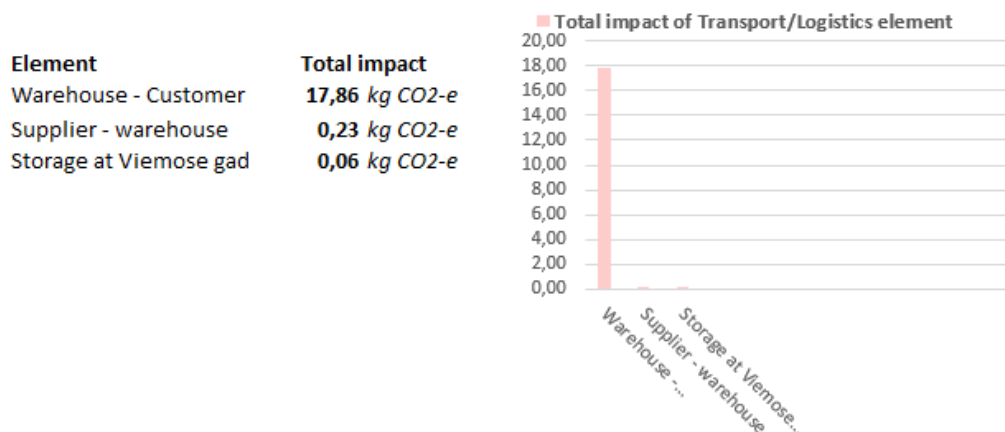
Below is an overview of the emission of the most emitting elements in the product. Each element is visually divided between the emission from the amount of material in the product and it's associated waste-emission. Included are the material and production waste with production processes, transportation and disposal scenarios. This gives an overview of each specific material versus waste.



\*) The values presented here, is total emission pr element (incl. Material, production, transport, Waste)

## Transport emissions of final product\*

Product transportation can be seen below, divided into the different transport legs, correlating with the route of the final product.



# #139 BOA – 50% R-PE / 50% Virgin PE

## The total estimated climate emission

**276 kg CO2eq**

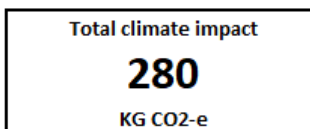
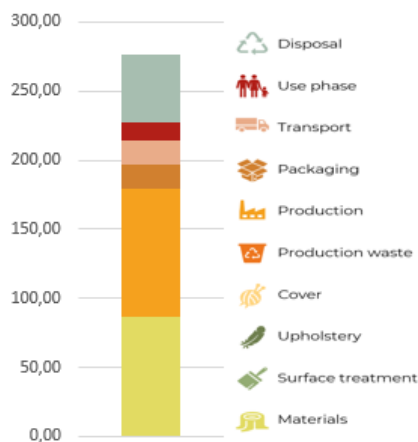
Potential impact of missing data

Best Case: 276 kg CO2eq

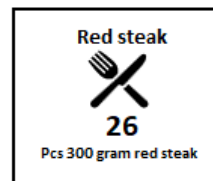
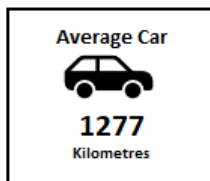
Worst Case: 280 kg CO2eq

## Climate emissions of final product

The complete LCA-screening (cradle-to-grave) of your product can be seen below. The total emissions with a range reflecting the uncertainty of data, based on inputs. All life-cycle-stages have been presented individually and their contribution can be seen in the column. Furthermore, a comparison of reliable goods or activities have been presented correlating with the total climate emission of the product.



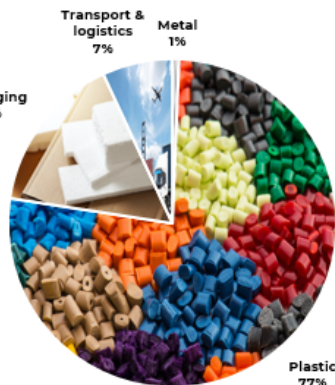
*This Climate emission is the approximate equivalent of:*



## Material group emissions\*

Presented below are the different material groups in the product and their estimated contribution. Included are all upstream transportation and processes on the materials along with production, production waste and waste scenarios, in order to better understand which material group contributes the most in the product.

Group	Total impact
Solid Wood	0,00 kg CO2-e 0%
Wood based board	0,00 kg CO2-e 0%
Metal	1,72 kg CO2-e 1%
Plastic	201,86 kg CO2-e 77%
Glass / Stone / Ceramics	0,00 kg CO2-e 0%
Surface finish & chemicals	0,00 kg CO2-e 0%
Upholstery	0,00 kg CO2-e 0%
Cover	0,00 kg CO2-e 0%
Electronic components	0,00 kg CO2-e 0%
Packaging	41,15 kg CO2-e 16%
Transport & logistics	18,15 kg CO2-e 7%



*\*) The values presented here, is total emission pr material group (incl. material, production, material-transport and waste,)*

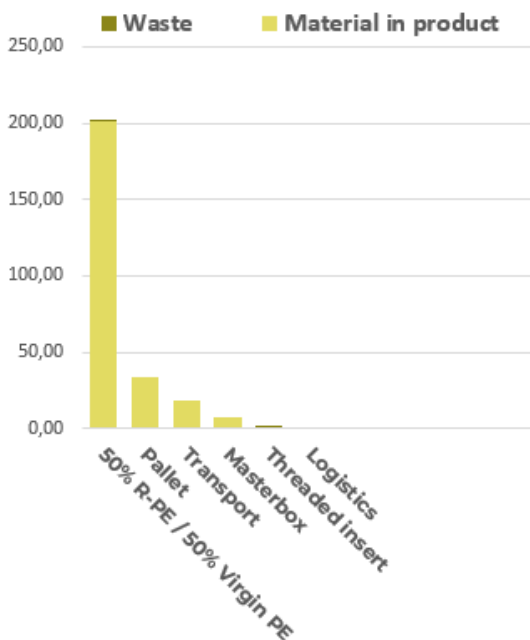


# #139 BOA – 50% R-PE / 50% Virgin PE

## Specific material element emissions\*

Below is an overview of the emission of the most emitting elements in the product. Each element is visually divided between the emission from the amount of material in the product and it's associated waste-emission. Included are the material and production waste with production processes, transportation and disposal scenarios. This gives an overview of each specific material versus waste.

Element	Total impact
50% R-PE / 50% Virgin P	<b>201,86 kg CO2-e</b>
Pallet	<b>33,17 kg CO2-e</b>
Transport	<b>18,09 kg CO2-e</b>
Masterbox	<b>7,97 kg CO2-e</b>
Threaded insert	<b>1,72 kg CO2-e</b>
Logistics	<b>0,06 kg CO2-e</b>

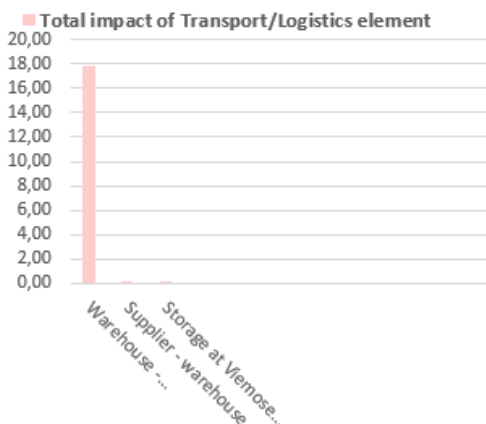


\*) The values presented here, is total emission pr element (incl. Material, production, transport, Waste)

## Transport emissions of final product\*

Product transportation can be seen below, divided into the different transport legs, correlating with the route of the final product.

Element	Total impact
Warehouse - Customer	<b>17,86 kg CO2-e</b>
Supplier - warehouse	<b>0,23 kg CO2-e</b>
Storage at Viemose gad	<b>0,06 kg CO2-e</b>



# #139 BOA – 100% Bio-PE

## The total estimated climate emission

**283 kg CO2eq**

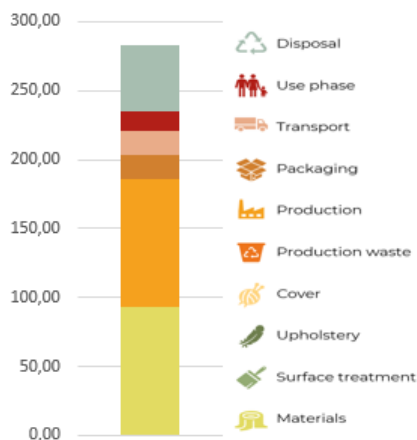
Potential impact of missing data

Best Case: 280 kg CO2eq

Worst Case: 283 kg CO2eq

## Climate emissions of final product

The complete LCA-screening (cradle-to-grave) of your product can be seen below. The total emissions with a range reflecting the uncertainty of data, based on inputs. All life-cycle-stages have been presented individually and their contribution can be seen in the column. Furthermore, a comparison of reliable goods or activities have been presented correlating with the total climate emission of the product.



**Total climate impact**  
**280**  
KG CO2-e

*This Climate emission is the approximate equivalent of:*

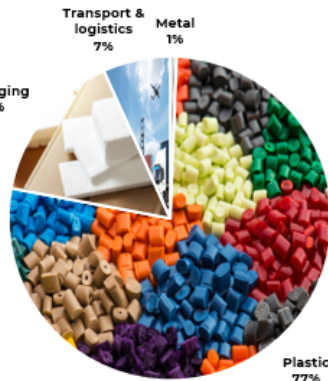
**Average Car**  
  
**1309**  
Kilometres

**Red steak**  
  
**26**  
Pcs 300 gram red steak

## Material group emissions\*

Presented below are the different material groups in the product and their estimated contribution. Included are all upstream transportation and processes on the materials along with production, production waste and waste scenarios, in order to better understand which material group contributes the most in the product.

Group	Total impact	
Solid Wood	0,00 kg CO2-e	0%
Wood based board	0,00 kg CO2-e	0%
Metal	1,72 kg CO2-e	1%
Plastic	208,35 kg CO2-e	77%
Glass / Stone / Ceramics	0,00 kg CO2-e	0%
Surface finish & chemicals	0,00 kg CO2-e	0%
Upholstery	0,00 kg CO2-e	0%
Cover	0,00 kg CO2-e	0%
Electronic components	0,00 kg CO2-e	0%
Packaging	41,15 kg CO2-e	15%
Transport & logistics	18,15 kg CO2-e	7%

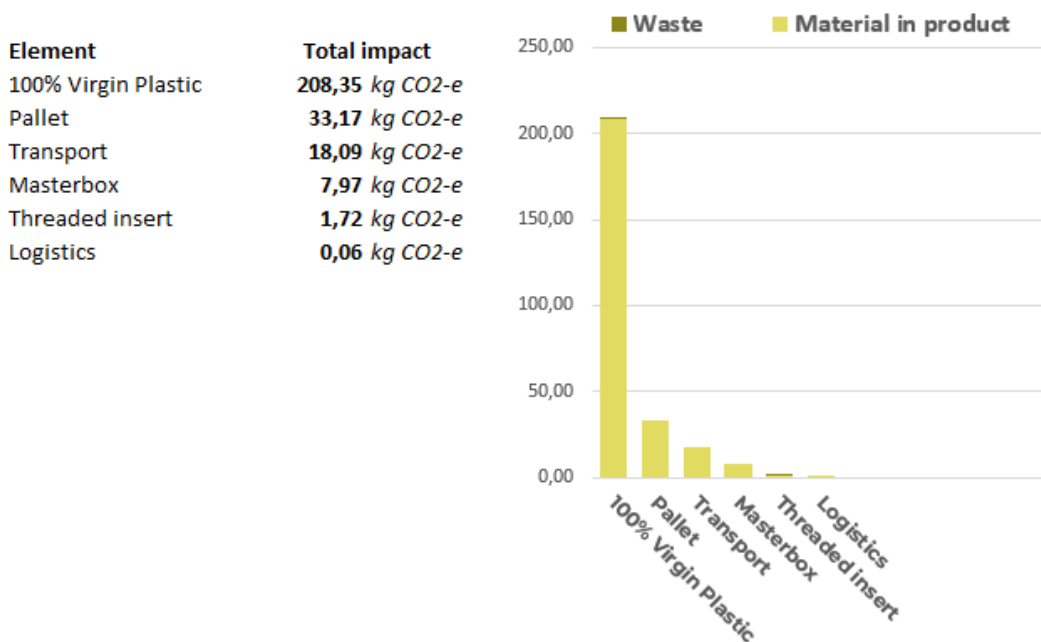


*\*) The values presented here, is total emission pr material group (incl. material, production, material-transport and waste,)*

# #139 BOA – 100% Bio-PE

## Specific material element emissions\*

Below is an overview of the emission of the most emitting elements in the product. Each element is visually divided between the emission from the amount of material in the product and it's associated waste-emission. Included are the material and production waste with production processes, transportation and disposal scenarios. This gives an overview of each specific material versus waste.



\*) The values presented here, is total emission pr element (incl. Material, production, transport, Waste)

# DATA QUALIFICATION

This LCA-screening is based on user-input data from the brand owner, along with average data in conformity with PEF. Where no user-input have been applied, conservative assumptions have been created.

## **Assumptions may include:**

- Origin of Materials
- Origin of component production
- Additional material information (e.g. for textiles: D-tex values and treatment processes)
- Any Recycled or certified Sustainable content in each material is only included when sufficient documentation has been provided.
- Production waste amounts and handling of such.
- Transportation types and distances
- Waste handling of the product at end-of-life (EU average data)

It is possible for the Brand-owner to apply company specific data on a material or component-production by "onboarding" each individual production site into the system. This is referred to as primary process data and can cover a certain percentage of the total production-stage and part of the material-stage.

**Considering the diverse possible range of final fabrics utilized in the product, it is important to note that this LCA screening, does not account for the textiles used, which will be taken into account at a later stage. Therefore, it should be highlighted that it would be imperative to consider them when evaluating the overall climate impact associated with the product.**

# MÅLBAR



Nørre voldgade 6, 2.  
1358 København K