

INDEED

HOW 2 CUT THE CRAP

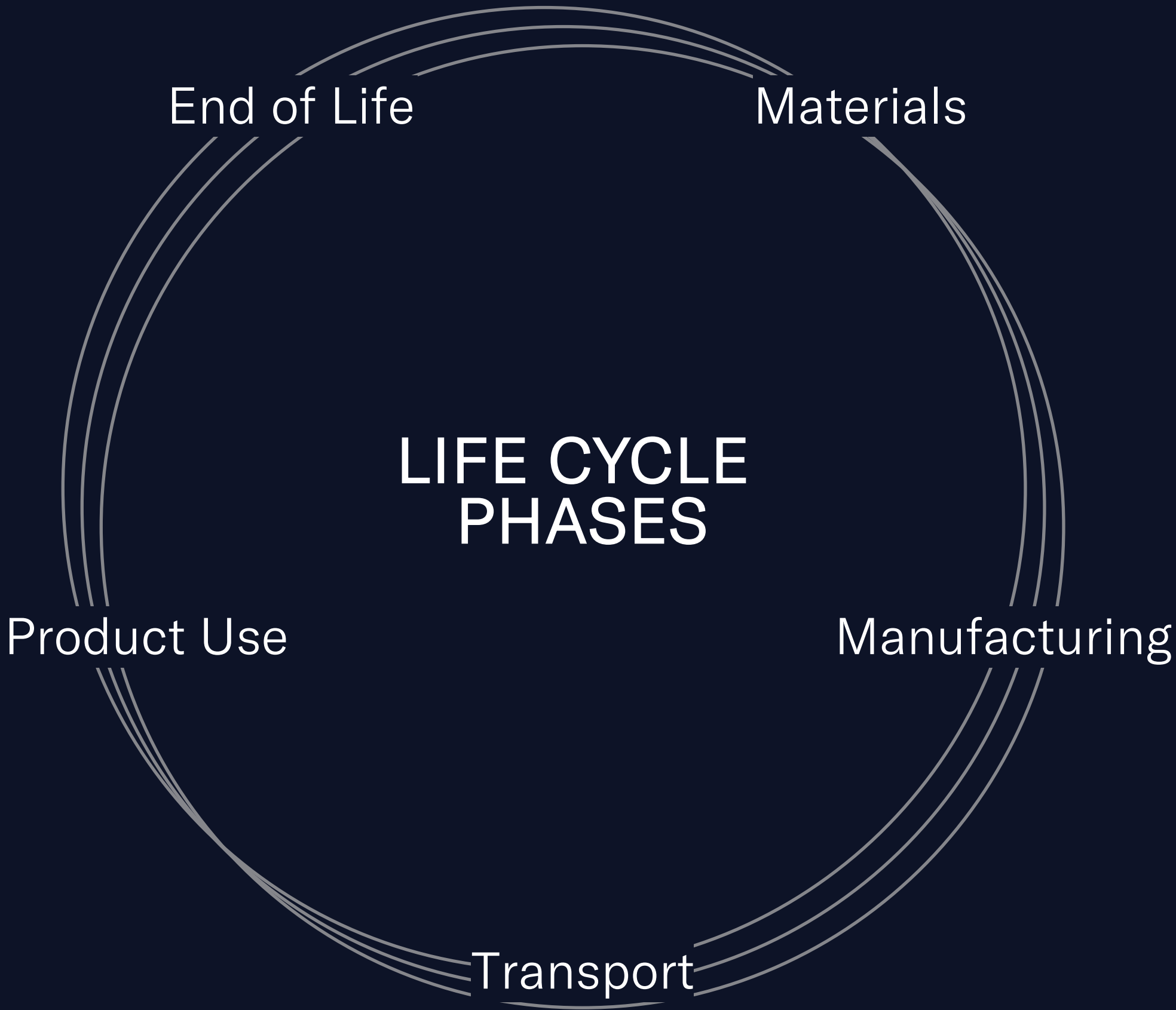
CONSIDER CO₂-EMISSIONS IN YOUR DESIGN DECISIONS

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80% of the products' carbon footprint are influenced by decisions made during the design phase.

EUROPEAN PARLIAMENTARY RESEARCH SERVICE (2009). THE ECODESIGN DIRECTIVE (2009/125/EC).

- 1. THEORY
- 2. Data sources
- 3. Equations



1. Theory

2. DATA SOURCES

3. Equations

Materials

- Supplier LCAs
- LCA databases: ecoinvent, GaBi, IDE Mat (TU Delft)

Manufacturing

- Electricity grid factors: ecoinvent, IGES, EPA
- Climate transparency report
- Supplier LCAs

Transportation

- Sea rates
- EPA GHG Emission Factors Hub
- Supplier LCAs

End of life

- EPA Waste Reduction (WARM)
- LCA databases: ecoinvent, GaBi, IDE Mat (TU Delft)
- Supplier LCAs

1. Theory

2. Data sources

3. EQUATIONS

Material (kgCO ₂ e)	=	Component + waste weight (kg material)	x	Material Carbon Intensity (kgCO ₂ e/kg material)	
Manufacturing (kgCO ₂ e)	=	Energy (kWh/kg material)	x	Country Grid Factor (kgCO ₂ e/kWh)	
Transportation (kgCO ₂ e)	=	Distance (km)	x	Product weight (kg)	x Mode CI (kgCO ₂ e/kg product per km)
Product use (kgCO ₂ e)	=	α (defined in project context)			
End of life (kgCO ₂ e)	=	Product material weight (kg material)	x	Landfill/ Incineration (CI) (kgCO ₂ e/kg material)	

Material

(kgCO₂e)

Data source: IDE mat (ecoinvent)

$$\begin{array}{ccccc} 0,120 & \times & 2,79 & = & 0,335 \\ \text{(kg material)} & & \text{(kgCO}_2\text{e/kg material)} & & \text{(kgCO}_2\text{e)} \end{array}$$

Ref weight (CAD)

ABS

Manufacturing

(kgCO₂e)

Data source: Climate Transparency Report

$$\begin{array}{ccccc} 9,48 & \times & 0,63 & = & 5,982 \\ (\text{kWh/kg material}) & & (\text{kgCO}_2\text{e/kWh}) & & (\text{kgCO}_2\text{e}) \end{array}$$

Injection molding

China grid



Transportation
(kgCO₂e)

4.000
(km)
↑
Google Maps

x

0,120
(kgCO₂e/kg material)
↑
Ref Weight (CAD)

x

0,03
(kgCO₂e/kg product per km)
↑
Sea way

=

14,4
(kgCO₂e)

Data source: EPA GHG
Emission Factors Hub

End of Life
(kgCO₂e)

0,120
(kg material)

x

3,1
(kgCO₂e/kg material)
↑
Data source: DIE mat (ecoinvent)

=

0,372
(kgCO₂e)



Net footprint = 21,09 kgCO₂e

Don't hide your pollution. Label it.

The shoe manufacturer allbirds is giving away its Carbon Footprint tools to the entire fashion industry. They know that sharing proprietary information might not make the most business sense. But the global climate crisis is bigger than business – as they say. And if competition got us into this mess, perhaps collaboration can get us out.

[allbirds.com/pages/carbon-footprint-calculator](https://www.allbirds.com/pages/carbon-footprint-calculator)



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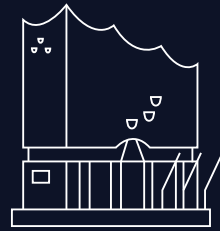
Thank you!

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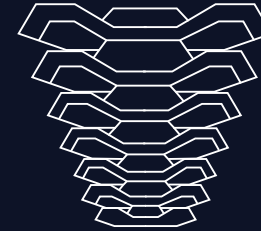
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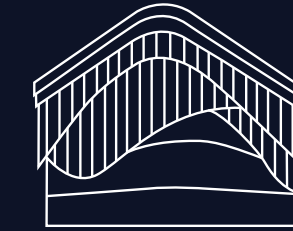
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