Product Carbon Footprint for uskkkfmwgg

Total PCF (GHG Protocol)

18.09 kg CO2e

Total Footprint

18.09 kg CO2e

Per 1.0 functional unit.

Carbon Intensity

18.09 kg CO2e/unit

Standardized for comparison.

Top Material Hotspot

Lithium-ion Battery

4.00 kg CO2e (64.41% of upstream materials).

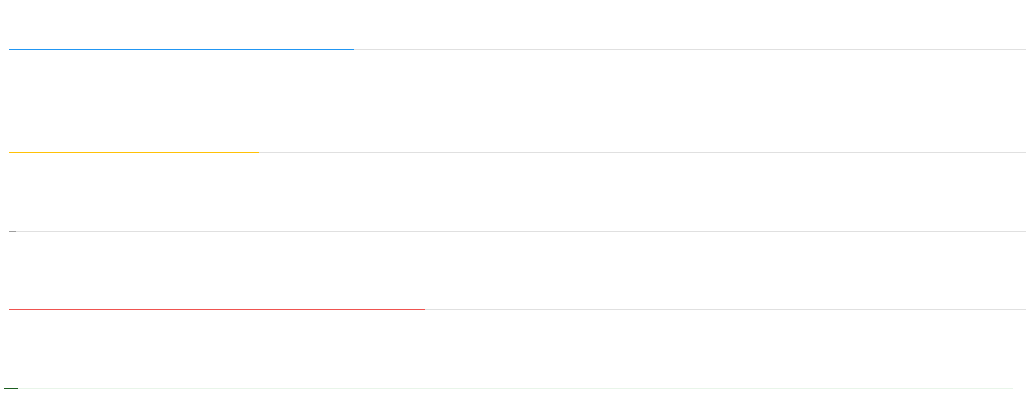
Primary Emission Scope

Use Phase (Scope 3)

7.50 kg CO2e (41.46% of total PCF).

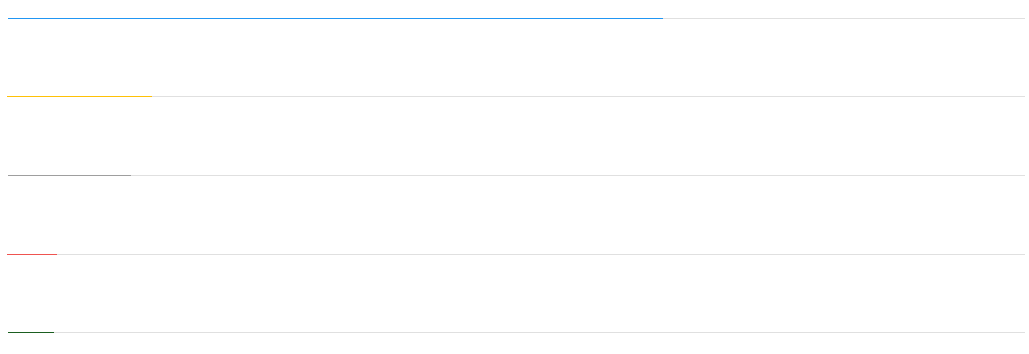
Emission Breakdown

Lifecycle Stage Contribution (Positive Emissions)



Material Acquisition & Pre-processing	**6.21 kg CO2e**
Manufacturing (Scope 1 & 2)	**4.50 kg CO2e**
Transportation & Distribution	**0.12 kg CO2e**
Use Phase (Downstream Scope 3)	**7.50 kg CO2e**
End-of-Life (Credit)	**-0.24 kg CO2e**

Material Carbon Impact (Top Contributors)



Lithium-ion Battery	**4.00 kg CO2e**
Plastic Casing (ABS)	**0.88 kg CO2e**
Printed Circuit Board (PCB)	**0.75 kg CO2e**
Aluminum Heat Sink	**0.30 kg CO2e**
Other Materials	**0.28 kg CO2e**

Key Insights & Hotspots

- **Use Phase Dominance:** The product's operational lifespan contributes the most to its overall footprint (41.46%), emphasizing energy efficiency.
- **Material Hotspots:** Lithium-ion battery, PCB, and Plastic Casing are significant material contributors, accounting for over 90% of upstream emissions.
- **Circular Economy Impact:** End-of-Life initiatives, particularly the take-back program, result in a net carbon credit (-0.24 kg CO2e), demonstrating positive circularity efforts.

Recommendations for Reduction

- **Material Optimization:** Investigate lower embedded carbon materials for batteries and PCBs, and explore modular design for easier disassembly.
- **Energy Efficiency:** Focus on product design improvements to reduce energy consumption during the use phase (e.g., more efficient power management).
- **Renewable Energy & Circularity:** Increase renewable energy sourcing in manufacturing beyond 50% and expand product take-back programs to maximize recycling.