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Product Carbon Footprint Analysis

Product: hdkqvmvukn

Total Estimated Lifecycle Footprint: **134.33 kgCO₂e**

Standard: GHG Protocol | System Boundary: Factory Gate (Extended Analysis)

134.33 kgCO₂e

Overall Product Footprint

134.33 kgCO₂e/unit

Carbon Intensity (per functional unit)

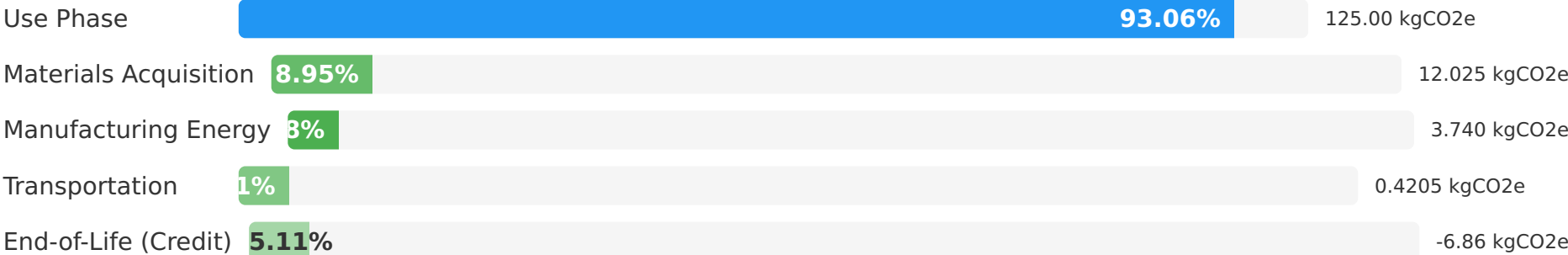
Aluminum Alloy Casing

Top Material Hotspot

Scope 3 (97.22%)

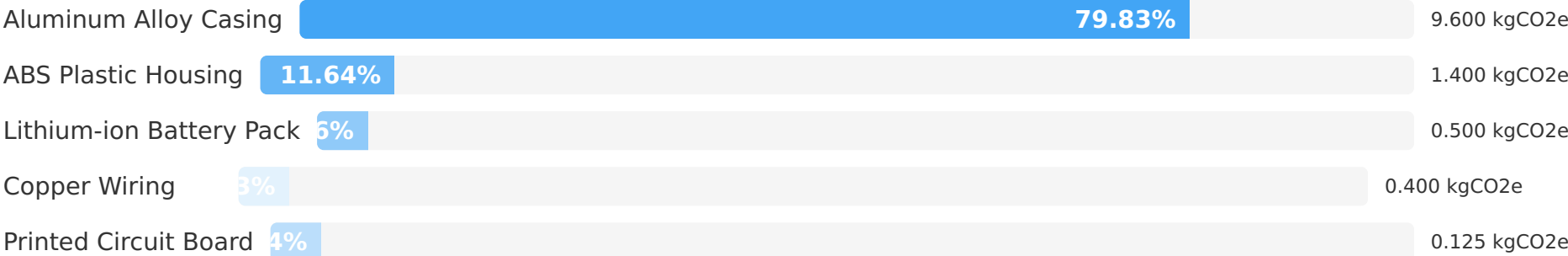
Primary Emission Scope

Emissions by Lifecycle Stage



Percentages represent contribution to the overall net product carbon footprint.

Emissions by Key Material Impact



Percentages are relative to total material emissions (12.025 kgCO2e).

Key Insights (Emission Hotspots)

- The **Use Phase** is the dominant emissions hotspot, contributing approximately **93.06%** of the product's total lifecycle footprint.
- **Scope 3 emissions** comprise **97.22%** of the overall footprint, highlighting the importance of value chain decarbonization.
- Material acquisition, particularly **Aluminum Alloy Casing**, is a significant contributor within upstream emissions.
- Robust **End-of-Life recycling and take-back programs** yield notable avoided emissions (a net credit of -6.86 kgCO₂e).

Recommendations for Emission Reduction

1. **Optimize Use Phase Energy Efficiency:** Focus on design improvements for lower energy consumption throughout the product's 5-year lifespan.
2. **Material Optimization:** Investigate and integrate lower-carbon alternatives or increase recycled content for high-impact materials like aluminum.
3. **Enhance Production Renewable Energy:** Further increase the current 70% renewable energy share at the Chinese production facility towards 100% green manufacturing.
4. **Strengthen Circular Economy:** Expand take-back and recycling initiatives for key components to maximize material recovery and further boost avoided emissions.