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# Product Carbon Footprint for vvlidhinff

System Boundary: factory\_gate | Standard: GHG Protocol | Production Country: China

Total PCF

**8.29**

**kg CO<sub>2</sub>e / unit**

TOTAL FOOTPRINT

**8.29**

kg CO<sub>2</sub>e / unit

CARBON INTENSITY

**11.05**

kg CO<sub>2</sub>e / kg

TOP MATERIAL HOTSPOT

**Aluminum Casing**

1.25 kg CO<sub>2</sub>e

PRIMARY EMISSION SCOPE

**Scope 2**

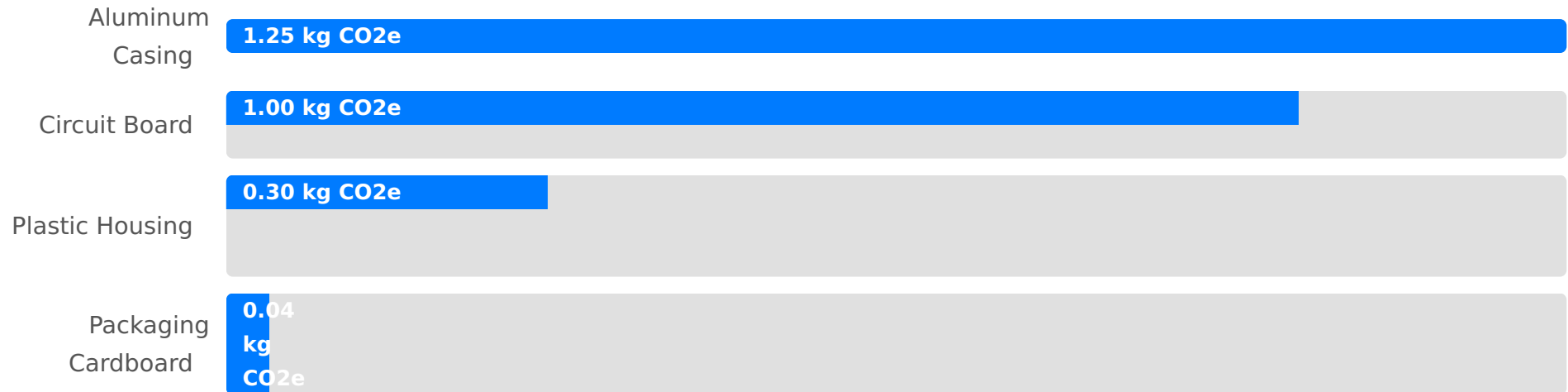
33.17% of total

## Lifecycle Stage Breakdown



- Materials (Scope 3, Cat 1)
- Production (Scope 2)
- Logistics (Scope 3, Cat 4)
- Use Phase (Scope 3, Cat 11)
- End-of-Life (Scope 3, Cat 12)

## Material Composition Carbon Impact



## Key Highlights & Insights

- **Material Impact Dominance:** Purchased goods and services, particularly raw material extraction and processing, are the largest contributors to the product's carbon footprint, with aluminum casing being a significant hotspot.
- **Use Phase Energy:** Energy consumption during the product's 5-year lifespan by the end-user constitutes a substantial emission factor, highlighting the importance of energy-efficient design.
- **Production Electricity:** Despite 50% renewable energy usage, the remaining non-renewable electricity in the production phase in China contributes significantly to emissions, emphasizing the need for further decarbonization of manufacturing operations.

## Recommended Action Plan

- **Sustainable Sourcing:** Prioritize suppliers with lower carbon material production and actively explore alternative low-impact materials for high-emission components like aluminum.
- **Energy Efficiency in Use:** Optimize product design for minimal energy consumption during its use phase, potentially through hardware improvements, smart power management features, or extending product lifespan.
- **Renewable Energy Expansion:** Increase the percentage of renewable energy used in manufacturing facilities in China and encourage renewable energy adoption across the supply chain to reduce Scope 2 and upstream Scope 3 emissions.
- **Logistics Optimization:** Investigate opportunities to optimize primary (Ocean Freight) and last-mile (Road Parcel) transportation routes and modes for reduced fuel consumption and emissions.
- **Circular Economy Integration:** Enhance existing circular/take-back programs and design for even higher recyclability (beyond 80%) to minimize end-of-life emissions and promote resource circulation.