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Product Carbon Footprint for penhvmmnxe

carboncalcpcf.com

28.37 kg CO2e (per unit)

Total Footprint

28.37

kg CO2e / unit

Top Material Hotspot

Circuit Board

15.0 kg CO2e

Primary Emission Scope

Scope 3

Upstream & Downstream

Manufacturing Renewable

75%

Energy Usage

Lifecycle Stage Breakdown

Raw Materials	**53.48% (15.27 kg CO2e)**
Use Phase	**43.79% (12.5 kg CO2e)**
Manufacturing	**2.63% (0.75 kg CO2e)**
Transport	**0.09% (0.03 kg CO2e)**
End-of-Life (Credit)	**-0.17 kg CO2e**

Material Carbon Impact Breakdown

Circuit Board	**98.26% (15.0 kg CO2e)**
Plastic Casing	**1.64% (0.25 kg CO2e)**
Metal Screws	**0.10% (0.015 kg CO2e)**

Key Highlights

- **Raw Materials Dominate:** The "Circuit Board" component alone contributes 15.0 kg CO2e, representing approximately 53.8% of the total product footprint.
- **Significant Use Phase Impact:** Energy consumption during the product's 5-year lifespan accounts for 12.5 kg CO2e (44.1%), making it the second largest hotspot.
- **Circular Economy Benefits:** A 60% recyclability rate and active take-back programs result in a net carbon credit (-0.17 kg CO2e) at end-of-life.

Recommendations for Reduction

1. **Material Decarbonization:** Prioritize sourcing lower-carbon alternatives for the circuit board. Engage suppliers on their production footprints and explore design for modularity or lighter materials.
2. **Optimize Use Phase:** Investigate design improvements for greater energy efficiency, implement smart power management features, and educate users on energy-saving practices.
3. **Expand Circularity:** Enhance existing take-back programs, aim for higher recyclability percentages, and explore component reuse or remanufacturing opportunities.
4. **Engage Supply Chain:** Collaborate closely with key material and component suppliers to drive renewable energy adoption and process efficiency improvements across the value chain.