carboncalcpcf.com

Product: **xixmswndmy**
System Boundary: **factory_gate**

Product Carbon Footprint Dashboard

Total PCF (factory_gate):

2.715 kg CO2e

Total Footprint (factory_gate)

2.715 kg CO2e

for 1.0 unit

Carbon Intensity

2.715 kg CO2e/unit

Relative to functional unit

Top Material Hotspot

Lithium-ion Battery

0.60 kg CO2e (22% of factory_gate PCF)

Primary Emission Scope

Scope 3 (Upstream)

68.7% of factory_gate PCF

Emissions Breakdown by Lifecycle Stage

(within factory_gate boundary)

Raw Material Acquisition & Processing	1.925 kg CO2e (70.9%)
Manufacturing (Energy)	0.750 kg CO2e (27.6%)
Upstream Transport	0.040 kg CO2e (1.5%)

Top Material Carbon Impacts

(Relative to Total Bill of Materials: 1.925 kg CO2e)

Lithium-ion Battery	0.60 kg CO2e (31.2%)
Silicon Chipset	0.50 kg CO2e (26.0%)
Printed Circuit Board (PCB)	0.45 kg CO2e (23.4%)
ABS Plastic Casing	0.24 kg CO2e (12.5%)

Key Findings & Hotspots

Raw material acquisition and processing constitute the largest portion of the carbon footprint within the factory_gate boundary (approximately 70.9%).

The company's 75% renewable energy usage significantly mitigates manufacturing energy impact; without it, this share would be much higher.

While not included in the factory_gate total, the Use Phase represents the most substantial part of the *full* lifecycle footprint (4.563 kg CO2e), emphasizing energy-efficient design.

Action Plan: How to Reduce Impact

Material Optimization: Explore alternative, lower embodied carbon materials for high-impact components like the Silicon Chipset and Lithium-ion Battery.

Energy Efficiency in Use: Investigate technologies to further reduce the energy consumption of xixmswndmy during its operational lifespan.

Renewable Energy Expansion: Continue to invest in or source 100% renewable energy for manufacturing operations to eliminate Scope 2 emissions.

Circular Economy Integration: Strengthen take-back programs and explore design for disassembly to increase recyclability beyond 60%.

Supply Chain Engagement: Work with key suppliers for high-carbon materials to encourage their own emission reduction initiatives.