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Product Carbon Footprint for: Powerbank 100W

A detailed 'factory-gate' analysis adhering to GHG Protocol standards.

Total PCF: 8.126 kg CO₂e

Functional Unit

1.0 Unit

of 100W Power Bank

System Boundary

Factory Gate

(Cradle-to-Gate)

Primary Emission Scope

Scope 3

(97.5% of total)

Carbon Intensity

16.25 kg

CO₂e per kg of product

Lifecycle Stage Carbon Breakdown

Materials Acquisition & Processing	7.88 kg CO ₂ e (97.0%)
Final Assembly Energy (Scope 2)	0.19 kg CO ₂ e (2.3%)
Upstream Transportation (Scope 3)	0.05 kg CO ₂ e (0.6%)
Direct Operations (Scope 1)	0.01 kg CO ₂ e (0.1%)

Top Material Carbon Hotspots

Lithium-ion Battery Pack	5.55 kg CO ₂ e (68.3%)
Aluminum Casing	0.99 kg CO ₂ e (12.2%)
FR-4 PCB Material	0.90 kg CO ₂ e (11.1%)
ABS Plastic	0.25 kg CO ₂ e (3.1%)
Other Components & Transport	0.44 kg CO ₂ e (5.3%)

Key Insights & Highlights

- The Lithium-ion Battery Pack is the dominant emission hotspot, accounting for 68.3% of the total PCF due to energy-intensive production.
- Scope 3 (Value Chain) emissions represent the vast majority (97.5%) of the product's carbon footprint, requiring deep supply chain engagement.
- The overall Product Carbon Footprint (PCF) for a single 100W Power Bank (factory-gate) is 8.126 kg CO₂e.

Recommendations for Emission Reduction

- Decarbonize Battery Production:** Engage suppliers to adopt renewable energy and explore lower-carbon battery chemistries.
- Sustainable Material Sourcing:** Prioritize recycled content for aluminum casings and ABS plastic components.
- Energy Efficiency & Renewables in Assembly:** Improve energy efficiency at the final assembly plant and transition to 100% renewable electricity.
- Optimized Logistics:** Further optimize transportation routes and modes, favoring lower-carbon options like rail or sea freight within Europe.

