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Product Carbon Footprint for **zzmztklwmw**

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46.53 kg CO₂e

TOTAL PRODUCT FOOTPRINT

46.53

Carbon Intensity (kg CO2e/unit)

Use Phase

Top Emission Hotspot (~53.7%)

Scope 3

Primary Emission Scope (Value Chain)

Factory_gate

System Boundary

Lifecycle Stage Breakdown

Materials

Acquisition

Manufacturing
(Scope 2)

Transport

Use Phase

End-of-Life activities resulted in a net carbon offset of **-0.25 kg CO₂e**.

Key Insights & Hotspots

- **Use Phase Dominance:** The product's operational energy consumption over its lifespan accounts for over half (53.7%) of its total carbon footprint.
- **Logistics Impact:** Downstream transportation, particularly last-mile delivery, is a significant contributor, making up 28.4% of emissions.
- **Material Contributions:** Material production, notably Lithium-ion Batteries and ABS Plastic, contributes 10.9% to the total PCF.

Top Material Carbon Impact

Lithium-ion Battery	2.00 kg CO2e
ABS Plastic Granules	1.25 kg CO2e
Printed Circuit Board (PCB)	0.80 kg CO2e
Sensor Chip	0.60 kg CO2e

Recommendations for Reduction

- ✓ **Optimize Use Phase:** Implement energy-efficient designs and explore alternative power sources for product operation.
- ✓ **Enhance Logistics:** Streamline transport routes, consider low-emission modes (e.g., rail), and consolidate shipments to reduce distance.
- ✓ **Sustainable Sourcing:** Prioritize materials with lower embodied carbon, increase recycled content, and investigate bio-based alternatives.
- ✓ **Boost Renewables in Mfg:** Further increase renewable energy utilization in production facilities through direct procurement or on-site generation.
- ✓ **Strengthen Circularity:** Expand take-back programs, promote product longevity, and design for disassembly to improve recycling rates.