CARBONCALCPCF.COM

Product Carbon Footprint: xtpqkpnlsz

Total PCF: 18.201 kg CO_2e

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18.201 kg CO_2e

Per 1.0 unit

Carbon Intensity

30.335 kg CO_2e/kg

Based on 0.6 kg product mass

Top Material Hotspot

1.440 kg CO_2e

Lithium-Ion Battery Cell

Primary Emission Scope

Scope 3

83.65% of total PCF

Lifecycle Stage Breakdown

Use Phase	61.81% (11.250 kg CO_2e)
Material Acquisition	20.58% (3.745 kg CO_2e)
Manufacturing Energy	16.35% (2.976 kg CO_2e)
Transportation	3.84% (0.698 kg CO_2e)
End-of-Life (Net Saving)	-2.57% (-0.468 kg CO_2e)

Top Material Carbon Impact

Lithium-Ion Battery Cell	1.440 kg CO_2e
Recycled ABS Plastic Enclosure	0.750 kg CO_2e
Printed Circuit Board (PCB)	0.750 kg CO_2e
Aluminum Heat Sink	0.700 kg CO_2e

Key Insights & Hotspots

- Use Phase is the most significant contributor (61.81%) due to the product's operational energy consumption.
- Material Acquisition (20.58%) is the second largest hotspot, driven by raw material extraction and pre-processing.
- Manufacturing Energy (16.35%) from purchased electricity in China presents a substantial area for impact reduction.

Recommendations for Emission Reduction

1. **Optimize Use Phase Efficiency:** Invest in R&D to significantly reduce energy consumption during the product's operational life.
2. **Enhance Renewable Energy Sourcing:** Increase the percentage of renewable energy used at the manufacturing facility in China.
3. **Source Low-Impact Materials:** Explore alternative materials with inherently lower carbon footprints; engage suppliers for primary emission data.
4. **Strengthen Circularity:** Further develop take-back and recycling programs to maximize material recovery and increase recyclability beyond 60%.
5. **Optimize Logistics:** Continuously evaluate transportation modes and routes to minimize distances and utilize the most efficient transport options.