

carboncalcpcf.com

# Product Carbon Footprint Dashboard

Product: niqdpypevh (Smart Home Device)

Standard: GHG Protocol | Production Country: China

Total Cradle-to-Grave PCF

**15.66** kgCO<sub>2</sub>e

Carbon Intensity

**15.66** kgCO<sub>2</sub>e/unit

Top Emission Hotspot

**Use Phase** (63.8%)

Primary Emission Scope

**Scope 3** (Value Chain)

## Top Material Impact

# Semiconductor Chip (1.50 kgCO2e)

## Lifecycle Stage Breakdown

Use Phase 10.0 kgCO2e

Material Acquisition & Processing 7.1 kgCO2e

eM

eE

eT

The Use Phase (63.8%) and Material Acquisition & Processing (31.7%) are the dominant contributors to the product's overall carbon footprint.

## Top Material Carbon Impact (by kgCO2e)

Semiconductor Chip 1.50 kgCO2e

Printed Circuit Board (PCBA) 1.25 kgCO2e

Lithium-ion Battery 1.20 kgCO2e

eC

High-tech components like semiconductor chips, PCBAs, and the Lithium-ion battery are the most carbon-intensive elements of the Bill of Materials.

## Highlights & Hotspots

- The **Use Phase** accounts for the largest share (63.8%) of the total carbon footprint due to energy consumption over the product's lifespan.
- **Materials Acquisition & Processing** is the second largest contributor (31.7%), primarily driven by complex electronic components and the battery.
- **Manufacturing emissions** (2.3%) are present despite 60% renewable energy use; further decarbonization of the energy mix is an opportunity.

## Recommendations for Reduction

- **Enhance Use Phase Efficiency:** Prioritize R&D to significantly reduce the device's energy consumption during operation.
- **Sustainable Material Sourcing:** Investigate and implement recycled content for plastics and metals; explore bio-based alternatives.
- **Strengthen Circularity:** Expand and promote the manufacturer-led device take-back program for maximum material recovery.
- **Increase Renewable Energy Adoption:** Strive for 100% renewable energy use at manufacturing facilities in China.
- **Optimize Logistics:** Continuously seek efficiencies in transport routes, loading, and explore lower-emission freight options.