carboncalcpcf.com

Product Carbon Footprint Analysis Report

Product: jmygifzlpl

Company Name: pxlifkxhxo

Senior Sustainability Consultant: ootoijlwhu

Accounting Standard: GHG Protocol

Disclaimer: This report is generated based on available data and industry standards, adhering to the GHG Protocol. While every effort has been made to ensure accuracy, the results are indicative and subject to the quality and

Product Carbon Footprint Report for jmygifzlpl

Generated Date: May 21, 2026

Executive Summary

This report presents a high-detail Product Carbon Footprint (PCF) analysis for the product jmygifzlpl, manufactured by pxlifkxhxo. The analysis was conducted by Senior Sustainability Consultant ootoijlwhu, strictly adhering to the GHG Protocol. The system boundary for this primary PCF is "factory_gate", encompassing all emissions from raw material acquisition, manufacturing, and inbound logistics up to the point the product leaves the factory. For a comprehensive view, the report also incorporates expanded calculations for the use phase and end-of-life scenarios. The primary goal is to identify emission hotspots and provide a baseline for future emission reduction strategies.

---

1. Scope Definition

1.1 Functional Unit

The functional unit for this Product Carbon Footprint analysis is **1.0 unit of jmygifzlpl**. This unit serves as the reference basis for quantifying all associated

greenhouse gas emissions throughout its lifecycle stages.

1.2 System Boundary

The defined system boundary for the primary PCF calculation is **"factory_gate"** (also known as Cradle-to-Gate). This boundary includes all upstream emissions from the extraction and processing of raw materials, the manufacturing of components, inbound transportation to the production facility, and the production processes at pxlifkxhxo\'s factory. While the primary PCF adheres to this boundary, this report also includes expanded calculations for the use phase and end-of-life treatment to provide a broader lifecycle perspective (Cradle-to-Grave) as per the report requirements.

1.3 Geographic Scope

- **Final Production Country:** China
- **Supply Chain Focus:** Europe Focused (implying significant upstream material and component sourcing from Europe, and potential downstream market in Europe).

1.4 Accounting Standard

This analysis is performed in strict accordance with the **GHG Protocol Product Standard**. Emissions are categorized into Scope 1 (direct emissions from owned or controlled sources), Scope 2 (indirect emissions from the generation of purchased energy), and Scope 3 (all other indirect emissions that occur in the value chain, both upstream and downstream). The 2026 Land Sector and Removals (LSR) Standard update is acknowledged, and efforts are made to ensure at least 95% coverage for Scope 3 reporting, reflecting 2026 requirements.

1.5 Allocation

Allocation rules are applied to distribute emissions when multiple products share common processes or facilities. For this specific product, where shared processes occur, mass-based allocation or economic allocation methods are employed to ensure a fair distribution of environmental burdens. Given the functional unit is a discrete product, direct attribution of materials and energy is prioritized where possible.

---

2. & 3. Lifecycle Mapping (LCI Inventory Stages) & Data Collection

This section details the inventory data collected and the lifecycle stages mapped for the jmygifzlpl product.

2.1 Material Acquisition & Pre-processing (Scope 3 Upstream)

The Bill of Materials (BOM) for jmygifzlpl (sunvepvd) was utilized to calculate the emissions associated with raw material extraction, processing, and component manufacturing. The provided "Total Carbon" values for each material were used directly in the calculations for accuracy. The assumed total product weight is 0.345 kg.

ID	Description	Category	Process	Qty (Unit)	Emission Factor (kg CO2e/ unit)	Total Carbon (kg CO2e)
M001		Plastic		0.2 kg	2.5	0.50
Total Material Carbon Impact (kg CO2e):						**2.60**

ID	Description	Category	Process	Qty (Unit)	Emission Factor (kg CO2e/ unit)	Total Carbon (kg CO2e)
	ABS Plastic Casing		Injection Molding			
M002	PCB Board	Electronics	Manufacturing	0.05 kg	15.0	0.75
M003	Copper Wire	Metal	Extrusion	0.01 kg	5.0	0.05
M004	Lithium-ion Battery	Energy Storage	Assembly	0.08 kg	10.0	0.80
M005	Integrated Circuits	Electronics	Wafer Fabrication	0.005 kg	100.0	0.50
Total Material Carbon Impact (kg CO2e):						**2.60**

2.2 Manufacturing/Production (Scope 2 & Scope 3 Upstream)

The production phase involves the assembly and finishing of jmygifzlpl in China.

- **Energy Intensity:** khuwgjuvoo (5.0 kWh/unit)
- **Renewable Energy Usage:** fgnmlkpnus (75%)
- **Non-renewable Electricity Consumption:** 1.25 kWh/unit
- **Renewable Electricity Consumption:** 3.75 kWh/ unit

2.3 Transport/Logistics (Scope 3 Upstream)

Inbound logistics for components sourced from Europe to the final production country (China) are considered within the factory_gate boundary.

- **Transport Mode:** Select Mode (Road Freight - Heavy Goods Vehicle (HGV))
- **Transport Distance:** iedzlilgfu (1500 km)
- **Product Weight for Transport (per functional unit):** 0.345 kg (0.000345 tonnes)
- **Last-Mile Delivery Channel:** Delivery Type (Courier Van) - Note: For a \'factory_gate\' boundary, last-mile delivery to the end-consumer is typically outside the primary scope. It would be considered in a full \'cradle-to-grave\' analysis.

2.4 Use Phase (Scope 3 Downstream - Expanded View)

Although typically outside a \'factory_gate\' boundary, the use phase impacts are calculated to provide a more comprehensive lifecycle perspective as requested.

- **Product Lifespan:** gwnjlsopht (5 years)
- **Energy Consumption in Use:** znkjjetnhi (10 kWh/year)
- **Total Energy Consumption over Lifespan:** 50 kWh

2.5 End-of-Life (EoL) (Scope 3 Downstream - Expanded View)

Similar to the use phase, EoL impacts are typically outside a \'factory_gate\' boundary but are included for a full lifecycle assessment.

- **Recyclability Percentage:** ljdhqgukto (80%)

- **Circular/Take-back Programs:** uzvfjkoglf (Yes, product take-back program in place)
- **Non-recycled Product Weight:** 0.069 kg (20% of 0.345 kg)

---

4. Emission Calculation (Activity * Emission Factor = CO2e)

Emissions are calculated using the activity data collected and applying relevant industry-standard emission factors (e.g., from Climatiq, MEE, GLEC, Empreinte® database). The GHG Protocol categorization is followed.

4.1 Emission Factors Used:

- **China Grid Electricity Emission Factor:** 0.6205 kg CO2e/kWh (National Average 2023)
- **Renewable Electricity Emission Factor:** 0.01 kg CO2e/kWh (for residual emissions)
- **Road Freight (HGV >20t) Emission Factor:** 0.092 kg CO2e/tonne-km (Well-to-Wheel, GLEC 2019)
- **End-of-Life Treatment (non-recycled electronics):** 0.802 kg CO2e/kg (Empreinte® database for Small Mixed Appliances, gross emission from treatment)

4.2 GHG Protocol Categorization and Calculations:

Scope 1 Emissions (Direct Emissions)

No direct Scope 1 emissions (e.g., from on-site fuel combustion) are reported for the production of jmygifzlpl based on the provided parameters. Any such

emissions would typically be integrated into the facility\'s overall Scope 1 inventory.

Scope 2 Emissions (Indirect Emissions from Purchased Energy)

These emissions primarily arise from the electricity consumed during the manufacturing process.

- Non-renewable electricity emissions: 1.25 kWh/unit * 0.6205 kg CO2e/kWh = 0.7756 kg CO2e/unit
- Renewable electricity emissions: 3.75 kWh/unit * 0.01 kg CO2e/kWh = 0.0375 kg CO2e/unit
- **Total Scope 2 Emissions: 0.7756 + 0.0375 = 0.8131 kg CO2e/unit**

Scope 3 Emissions (Other Indirect Emissions)

Scope 3 covers both upstream and downstream value chain emissions.

Upstream Scope 3 Emissions:

- **Materials Acquisition & Pre-processing (Category 1):**
  - Total Carbon from BOM: **2.60 kg CO2e/unit** (based on provided \'Total Carbon\' for each BOM item).
- **Upstream Transportation (Category 4 - Inbound Logistics):**
  - Emissions: 1500 km * 0.000345 tonnes * 0.092 kg CO2e/tonne-km = **0.0476 kg CO2e/unit**

Downstream Scope 3 Emissions (for expanded lifecycle view, outside factory_gate boundary):

These categories provide a cradle-to-grave perspective beyond the primary factory_gate boundary.

- **Use Phase (Category 11):**
  - Total energy consumption over lifespan: 50 kWh/unit
  - Emissions: 50 kWh/unit * 0.6205 kg CO2e/kWh (using China grid EF as proxy) = **31.0250 kg CO2e/unit**
- **End-of-Life Treatment of Sold Products (Category 12):**
  - Non-recycled portion: 0.069 kg/unit
  - Emissions: 0.069 kg/unit * 0.802 kg CO2e/kg = **0.0553 kg CO2e/unit**

4.3 Application of 2026 LSR Update

The Land Sector and Removals (LSR) Standard is acknowledged. For the product jmygifzlpl, direct land use change emissions or significant carbon removals specifically attributable to its manufacturing process or raw materials are not explicitly quantifiable from the provided data. However, the principles of the LSR Standard are integrated by considering the carbon implications of material sourcing where relevant (e.g., biomass-derived plastics, though not specified in this BOM) and emphasizing the circular economy impacts in the End-of-Life section. For electronics, direct land-use change is typically minimal compared to other sectors.

4.4 Scope 3 Compliance

The analysis ensures significant coverage of Scope 3 emissions, including key categories such as purchased goods and services (materials), upstream transportation, and, for a full lifecycle view, use phase and end-of-life treatment. This approach aims to

achieve at least 95% coverage for Scope 3 reporting, in line with 2026 requirements, by focusing on known material and energy flows.

---

5. Review & Report

5.1 Total Product Carbon Footprint

The Product Carbon Footprint for jmygifzlpl, based on a **"factory_gate" (Cradle-to-Gate) system boundary**, is:

3.46 kg CO2e per functional unit (1.0 unit of jmygifzlpl)

This total comprises:

- Scope 2 (Production Energy): 0.81 kg CO2e
- Scope 3 Upstream (Materials & Upstream Transport): 2.60 kg CO2e (Materials) + 0.05 kg CO2e (Transport) = 2.65 kg CO2e

For a **full lifecycle (Cradle-to-Grave) perspective**, including downstream phases:

34.54 kg CO2e per functional unit (1.0 unit of jmygifzlpl)

This includes the factory_gate emissions plus:

- Scope 3 Downstream (Use Phase): 31.03 kg CO2e
- Scope 3 Downstream (End-of-Life): 0.06 kg CO2e

5.2 Emission Hotspots and Reliability

The most significant emission hotspot for the product jmygifzlpl within the factory_gate boundary is the **material acquisition and pre-processing phase (Scope 3 Upstream)**, accounting for approximately 75% of the factory_gate PCF. This highlights the importance of sustainable material sourcing and eco-design for primary impact reduction.

When considering the full lifecycle, the **use phase (Scope 3 Downstream)** becomes the overwhelming hotspot, primarily due to the energy consumption of the product over its 5-year lifespan. This emphasizes the need for energy-efficient design and promotion of renewable energy use by end-consumers.

The reliability of this assessment is considered high due to the use of specific Bill of Materials data, customized energy usage data, and industry-standard emission factors. However, it\'s important to note that the quality of secondary data (generic emission factors) can influence overall accuracy. The presence of circular/take-back programs (uzvfjkoglf) suggests a commitment to reducing End-of-Life impacts, which is partially reflected in the recyclability percentage. Further detailed primary data collection on supply chain specifics and actual End-of-Life treatment processes would enhance accuracy.
