carboncalcpcf.com

Product Carbon Footprint Analysis Report

Product: tjewrdmzyq

Company: yjmzogilrl

Accounting Standard: GHG Protocol

Prepared by:

.

Senior Sustainability Consultant

Disclaimer: This report is generated based on available data and industry standards. While every effort has been made to ensure accuracy, the calculations rely on illustrative data assumptions for unspecified parameters and general emission factors. These assumptions are explicitly stated within the report.

Product Carbon Footprint Analysis Report: tjewrdmzyq

Generated Date: May 22, 2026

Company: yjmzogilrl

Senior Sustainability Consultant: zqprxisnwn

---

1. Executive Summary

This report presents a high-detail Product Carbon Footprint (PCF) analysis for the product **tjewrdmzyq**, manufactured by **yjmzogilrl**. The analysis adheres to the Greenhouse Gas (GHG) Protocol standards, providing a comprehensive assessment of greenhouse gas emissions across the product\'s entire lifecycle. While the system boundary for the company\'s direct operations is considered "factory_gate," the product carbon footprint is assessed on a cradle-to-grave basis to capture all significant emissions. The methodology incorporates the latest GHG Protocol guidelines, including consideration of the 2026 Land Sector and Removals (LSR) Standard where applicable, and ensures robust Scope 3 reporting. This assessment highlights key emission hotspots, offering actionable insights for yjmzogilrl to enhance its sustainability performance and contribute to global decarbonization efforts.

---

2. Methodology

The Product Carbon Footprint (PCF) analysis for tjewrdmzyq follows a five-step methodology as prescribed by the GHG Protocol Product Standard:

2.1. Step 1: Define Scope

- **Functional Unit:** The functional unit for this PCF analysis is **1.0 unit of tjewrdmzyq**. This unit serves as the reference basis for quantifying all associated GHG emissions throughout the product\'s lifecycle.
- **System Boundary:** While the operational boundary for yjmzogilrl\'s direct emissions might be considered "factory_gate", a comprehensive PCF analysis necessitates a broader perspective. Therefore, this report adopts a **cradle-to-grave system boundary**, encompassing all stages from raw material extraction to end-of-life treatment. This includes material acquisition and pre-processing, product production, distribution, storage, product use, and end-of-life treatment.
- **Geographic Scope:** The final production country for tjewrdmzyq is **China**, with a **Supply Chain Focus on Europe** for upstream material sourcing and downstream distribution to the end customer.
- **Allocation:** Emissions from processes shared by multiple products are allocated to tjewrdmzyq using a physical allocation method, primarily based on mass, in line with GHG Protocol guidance.

2.2. Step 2: Map Lifecycle (LCI Inventory Stages)

The lifecycle of tjewrdmzyq is mapped across the following stages, facilitating a detailed inventory of inputs and outputs:

- **Raw Material Acquisition & Pre-processing:** Extraction, cultivation, and initial processing of all

materials comprising the product and its packaging. This stage is primarily upstream (Scope 3 Upstream).

- **Product Production:** Manufacturing processes at yjmzogilrl\'s facility in China, including energy consumption, direct emissions from processes, and waste generation. This stage covers direct operational emissions (Scope 1 and 2) and upstream Scope 3 for purchased goods and services related to manufacturing.
- **Transport & Distribution:** Transportation of raw materials from suppliers (Europe Focused) to the factory in China (upstream), and distribution of the finished product from the factory in China to the end customer in Europe (downstream). This falls under Scope 3 Upstream and Downstream.
- **Product Use:** Energy consumption and other impacts associated with the product\'s functional lifespan. This is a Scope 3 Downstream category.
- **End-of-Life (EoL) Treatment:** Disposal, recycling, or recovery processes for the product and its packaging after its useful life. This is a Scope 3 Downstream category.

2.3. Step 3: Collect Data (Primary/Secondary Data Points)

Both primary and secondary data sources are utilized for this analysis:

- **Primary Data:** Specific product data provided by yjmzogilrl, including detailed Bill of Materials (BOM), manufacturing energy consumption, renewable energy usage, transport modes and distances, product lifespan, energy consumption during use, recyclability percentage, and details of circular programs.
- **Secondary Data:** To fill data gaps and ensure comprehensive coverage, industry-standard emission factors are applied. These factors are sourced from reputable databases such as Ecoinvent and

Environment, Food & Rural Affairs) and GLEC (Global Logistics Emissions Council Framework).

---

3. Assumptions for Illustrative Parameters

As several parameters were provided as placeholders, the following illustrative data has been assumed for the purpose of demonstrating the detailed PCF analysis. These assumptions are crucial for the calculations presented in this report.

- **Product (tjewrdmzyq) Weight:** 1 kg
- **Transport Mode (\'Select Mode\'):** Sea Freight for main intercontinental legs; Road Freight for regional and last-mile deliveries.
- **Transport Distance (\'yyhiyvjiyf\'):**
  - Inbound Raw Materials (Europe to China factory): 20,000 km (sea freight) + 500 km (road freight within China).
  - Outbound Finished Product (China factory to Europe distribution hub): 20,000 km (sea freight) + 100 km (road freight last mile to customer in Europe).
- **Last-Mile Delivery Channel (\'Delivery Type\'):** Road Freight (Light Commercial Van).
- **Renewable Energy Usage (\'voferpvfmk\'):** 60% of electricity purchased for manufacturing is from renewable sources.
- **Energy Intensity (kWh/unit) (\'eneydsnwox\'):** 5 kWh per unit of tjewrdmzyq during the manufacturing phase.
- **Product Lifespan (\'qpmknzvglx\'):** 5 years.
- **Energy Consumption in Use (\'qvsknfsslk\'):** 10 kWh per year during the product\'s lifespan.

- **Recyclability Percentage (\'yxiekxzioy\'):** 75% of the product\'s material can be recycled at end-of-life.
- **Circular/Take-back Programs (\'kfioptggzg\'):** yjmzogilrl operates a voluntary take-back program in key European markets, offering collection and initial sorting for end-of-life products to facilitate material recovery.
- **Emission Factors (Illustrative, based on general industry data/DEFRA/Ecoinvent for 2025-2026):**
    - Electricity (China Grid Mix): 0.65 kgCO2e/kWh (estimated for 2026, considering 2023-2025 values).
    - Electricity (Europe Grid Mix): 0.28 kgCO2e/kWh (estimated for 2026, considering 2020-2022 EU average).
    - Sea Freight (Container Ship): 0.01 kgCO2e/ton-km.
    - Road Freight (Heavy Duty Truck): 0.1 kgCO2e/ton-km.
    - Road Freight (Light Commercial Van - Last Mile): 0.3 kgCO2e/ton-km.
    - End-of-Life (Landfill/Incineration - average): 0.2 kgCO2e/kg.
    - End-of-Life (Recycling Benefit - average): -1.5 kgCO2e/kg (credit for avoided virgin material production).

---

4. Detailed Bill of Materials (BOM) & Material Impact

The following table presents the detailed Bill of Materials (BOM) for tjewrdmzyq, including quantities, illustrative emission factors (EF) and calculated total carbon impact for each component. These values are used for high-accuracy material impact calculation, replacing default estimates.

ID	Description	Category	Process	Qty (kg)	Unit	Emission Factor (kgCO2e/unit)
M001	Aluminum Casing	Metal	Extrusion	0.50	kg	7.00
M002	ABS Plastic Components	Plastic	Injection Molding	0.30	kg	3.50
M003	Silicon Chipset	Electronics	Fabrication	0.05	kg	50.00
M004	Copper Wiring	Metal	Drawing	0.10	kg	4.00
M005	Cardboard Packaging	Packaging	Manufacturing	0.05	kg	1.00
Total Material Carbon Footprint						

---

5. Emissions Calculation & GHG Protocol Adherence

The emissions calculation quantifies greenhouse gases in Carbon Dioxide Equivalents (CO2e) for each lifecycle stage, categorizing them according to the GHG Protocol\'s Scope 1, 2, and 3 definitions.

5.1. GHG Protocol Scopes Definition

- **Scope 1: Direct Emissions** - Emissions from sources owned or controlled by yjmzogilrl (e.g., direct fuel combustion in owned vehicles or facilities).
- **Scope 2: Indirect Emissions from Purchased Energy** - Emissions from the generation of purchased electricity, heat, or steam consumed by yjmzogilrl.
- **Scope 3: Other Indirect Emissions (Value Chain)** - chain of yjmzogilrl, both upstream (e.g., purchased

goods and services, upstream transportation) and downstream (e.g., use of sold products, end-of-life treatment of sold products, downstream transportation).

5.2. 2026 LSR Update and Scope 3 Compliance

The Land Sector and Removals (LSR) Standard, effective January 1, 2027, provides accounting requirements for land-related emissions and CO2 removals, particularly in agriculture and certain technological removals. While a detailed application requires specific agricultural data not assumed for this illustrative PCF, yjmzogilrl acknowledges its future relevance, especially for upstream agricultural components in its supply chain. The accompanying guidance for the LSR Standard is expected in Q2 2026.

For this PCF, efforts have been made to ensure comprehensive Scope 3 reporting, aiming for at least 95% coverage as per 2026 requirements, by including all significant upstream and downstream activities.

5.3. Emissions by Lifecycle Stage and Scope

5.3.1. Raw Material Acquisition & Pre-processing (Scope 3 Upstream)

This category covers the emissions associated with the production of all raw materials listed in the BOM. The "Total Carbon" from the BOM table represents these emissions.

Total Raw Material Emissions: **7.50 kgCO2e**

5.3.2. Product Production (Factory Gate)

Scope 1: Direct Emissions

Assuming minimal direct fuel combustion on-site not covered by electricity. For illustrative purposes, we\'ll assign a small, fixed value.

Illustrative Scope 1 Emissions (e.g., from minor on-site

Scope 2: Purchased Electricity Emissions

- Energy Intensity (per unit): 5 kWh/unit
- Renewable Energy Usage: 60%
- Non-renewable energy portion: 5 kWh * (1 - 0.60) = 2 kWh/unit
- China Grid Emission Factor: 0.65 kgCO2e/kWh
- Calculation: 2 kWh/unit * 0.65 kgCO2e/kWh = 1.30 kgCO2e

Total Scope 2 Emissions: **1.30 kgCO2e**

5.3.3. Transport & Distribution (Scope 3 Upstream & Downstream)

Assuming a product weight of 1 kg for tjewrdmzyq.

Upstream Transportation (Raw Materials from Europe to China factory)

- Sea Freight: 1 kg (product weight) * 20,000 km * 0.01 kgCO2e/ton-km = 200 kgCO2e/ton = 0.20 kgCO2e/kg product
- Road Freight (Port to Factory in China): 1 kg (product weight) * 500 km * 0.1 kgCO2e/ton-km = 50 kgCO2e/ton = 0.05 kgCO2e/kg product

Total Upstream Transport Emissions: **0.25 kgCO2e**

Downstream Transportation (Finished Product from China factory to Europe customer)

- Sea Freight (China to Europe Hub): 1 kg (product weight) * 20,000 km * 0.01 kgCO2e/ton-km = 200 kgCO2e/ton = 0.20 kgCO2e/kg product
- Last-Mile Delivery (Road Freight - Van in Europe): 1 kg (product weight) * 100 km * 0.3 kgCO2e/ton-km = 30 kgCO2e/ton = 0.03 kgCO2e/kg product

Total Downstream Transport Emissions: **0.23 kgCO2e**

5.3.4. Product Use Phase (Scope 3 Downstream)

- Product Lifespan: 5 years
- Energy Consumption in Use: 10 kWh/year
- Total Energy in Use: 5 years * 10 kWh/year = 50 kWh
- European Grid Emission Factor (where product is used): 0.28 kgCO2e/kWh
- Calculation: 50 kWh * 0.28 kgCO2e/kWh = 14.00 kgCO2e

Total Use Phase Emissions: **14.00 kgCO2e**

5.3.5. End-of-Life (EoL) Treatment (Scope 3 Downstream)

Assuming 1 kg product weight.

- Recyclability Percentage: 75%
- Mass to be recycled: 1 kg * 0.75 = 0.75 kg
- Mass to landfill/incineration: 1 kg * (1 - 0.75) = 0.25 kg
- Emissions from non-recycled waste: 0.25 kg * 0.2 kgCO2e/kg = 0.05 kgCO2e
- Emissions/Credits from recycling: 0.75 kg * (-1.5 kgCO2e/kg) = -1.125 kgCO2e (This is a net credit due to avoided virgin material production)

Total EoL Emissions (Net): 0.05 kgCO2e - 1.125 kgCO2e = **-1.075 kgCO2e**

yjmzogilrl\'s voluntary take-back program ("kfioptggzg") in European markets directly contributes to achieving this recycling rate, effectively mitigating end-of-life emissions by facilitating material recovery and reducing waste sent to landfill or incineration.

5.4. Summary of Product Carbon Footprint by Scope (per 1.0 unit of tjewrdmzyq)

GHG Scope Category	Lifecycle Stage	Emissions (kgCO2e)
Scope 1 (Direct)	Product Production (On-site Combustion)	0.10
Scope 2 (Purchased Energy)	Product Production (Purchased Electricity)	1.30
Scope 3 Upstream	Raw Material Acquisition & Pre-processing	7.50
Scope 3 Upstream	Transportation (Inbound Raw Materials)	0.25
Scope 3 Downstream	Transportation (Outbound Finished Product)	0.23
Scope 3 Downstream	Product Use Phase	14.00
Scope 3 Downstream	End-of-Life Treatment	-1.075
Total Product Carbon Footprint		**22.305**

---

6. Review & Report

6.1. Emission Hotspots

Based on the analysis, the primary emission hotspots for tjewrdmzyq are:

- **Product Use Phase:** At 14.00 kgCO2e, this stage

energy consumption over its 5-year lifespan. This highlights the importance of energy efficiency in product design.

- **Raw Material Acquisition & Pre-processing:** The procurement of materials, particularly the Silicon Chipset (2.50 kgCO2e) and Aluminum Casing (3.50 kgCO2e), accounts for a substantial portion of upstream emissions (7.50 kgCO2e).
- **Product Production (Scope 2):** While partially offset by renewable energy usage, purchased electricity for manufacturing in China still contributes 1.30 kgCO2e.

6.2. Reliability and Data Quality

The reliability of this PCF analysis is directly influenced by the quality of the input data. Primary data for the BOM and operational parameters are assumed to be accurate representations. Secondary data, primarily emission factors from Ecoinvent, DEFRA, and GLEC, are considered industry-standard and widely accepted for their robust methodologies.

It is important to note that specific values for placeholder parameters were illustrative assumptions. For a commercial, audit-defensible report, these would require direct primary data collection from suppliers and internal systems of yjmzogilrl. Continuous improvement in data collection, including engagement with suppliers for primary emission data, would further enhance the accuracy and granularity of future PCF assessments.

The application of the GHG Protocol ensures a structured and internationally recognized approach to carbon accounting, providing a credible basis for reporting and target setting.