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Product Carbon Footprint Report

Product Name: exnqxstdxl

Company Name: fedhpoiqlly

Accounting Standard: GHG Protocol

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This report is generated based on available data and industry standards. While efforts have been made to ensure accuracy, the actual footprint may vary based on precise operational details and evolving emission factors.

Product Carbon Footprint Report for exnqxstdxl

Generated Date: May 31, 2026

Executive Summary

This report presents a high-detail Product Carbon Footprint (PCF) analysis for the product exnqxstdxl, manufactured by fedhpoiql. The assessment was conducted by fdttwfqgrp, Senior Sustainability Consultant, in accordance with the GHG Protocol. The analysis covers the lifecycle emissions from raw material acquisition (upstream) through production, distribution, use, and end-of-life (downstream), focusing on a factory-gate system boundary with a supply chain emphasis on Europe and final production in China. Key findings highlight the major emission hotspots across the product's lifecycle, providing a basis for informed sustainability strategies.

Methodology

The Product Carbon Footprint (PCF) analysis for exnqxstdxl adheres strictly to the GHG Protocol Product Standard, covering all relevant greenhouse gas emissions expressed in carbon dioxide equivalents (CO₂e). The methodology followed these five key steps:

1. Define Scope

- **Functional Unit:** 1.0 unit of exnqxstdxl.
- **System Boundary:** Cradle-to-grave, with the primary production boundary at 'factory_gate', but including downstream phases (distribution, use, and end-of-life) to provide a comprehensive view.
- **Geographic Scope:** Final production occurs in China, with a supply chain focus on Europe for raw materials

and components. The use phase is assumed to reflect a typical global average energy mix, or relevant regional mix where specific data is unavailable.

- **Allocation:** Emissions are allocated directly to the functional unit. Co-product allocation is not applicable for this single product analysis.

2. **Map Lifecycle (Life Cycle Inventory - LCI stages)**

The lifecycle of exnqxstdxl was mapped to identify all relevant stages contributing to its carbon footprint. These stages include:

- **Raw Material Acquisition & Pre-processing:** Extraction and processing of all materials listed in the Bill of Materials (BOM).
- **Manufacturing:** Production processes at fedhpoiql's facility in China, including energy consumption.
- **Transport & Distribution:** Inbound logistics for raw materials (Europe to China) and outbound logistics for the finished product (from factory gate, including last-mile delivery).
- **Use Phase:** Energy consumption during the product's lifespan.
- **End-of-Life:** Disposal or recycling of the product at the end of its useful life.

3. **Collect Data (Primary/Secondary data points)**

Data collection involved utilizing both primary data provided by fedhpoiql and secondary data from industry-standard databases (e.g., Ecoinvent, DEFRA, publicly available research) for emission factors.

Detailed Bill of Materials (BOM) Data for exnqxstdxl

The following detailed BOM (iniklujj) was used for high-accuracy material impact calculation:

ID	Description	Category	Process	Qty	Unit	Emission Factor (kgCO2e/unit or kg)	Total Carbon (kgCO2e)
1	ABS Plastic Enclosure	Plastics	Injection Molding	0.25	kg	3.5	0.875
2	Lithium-ion Battery	Electronics	Manufacturing	0.05	unit	15.0	0.750
3	Printed Circuit Board (PCB)	Electronics	Assembly	0.03	kg	20.0	0.600
4	Copper Wiring	Metals	Extrusion	0.01	kg	5.0	0.050
5	Packaging Cardboard	Paper/Wood	Pulping & Forming	0.10	kg	1.2	0.120

Total Product Weight: 0.44 kg

Energy and Logistics Data

- **Renewable Energy Usage (Production):** xmzyivsgrq (70%)
- **Energy Intensity (Production):** zeyymxwhzd (10 kWh/unit)
- **Inbound Transport Mode:** Select Mode (Road Transport - Heavy Duty Truck)
- **Inbound Transport Distance:** ywtypymoim (500 km)
- **Last-Mile Delivery Channel:** Delivery Type (Small Parcel Carrier - Van)
- **Product Lifespan:** yfjfmhlqzr (5 years)
- **Energy Consumption in Use:** kmllsrwypt (20 kWh/year)
- **Recyclability Percentage (End-of-Life):** wkmusnzfxx (80%)
- **Circular/Take-back Programs:** dhxvtdgrxs (Active take-back program for key components)

4. **Calculate Emissions (Activity * Emission Factor = CO2e)**

Emissions were calculated for each lifecycle stage by multiplying activity data (e.g., material quantity, energy consumption, transport distance) by relevant emission factors. Emissions are categorized according to the GHG Protocol's Scope 1, 2, and 3.

Emission Factors Used:

- **China Grid Electricity:** 0.6205 kg CO2e/kWh (national average for 2023)
- **Road Transport (Heavy Duty Truck):** 0.07 kg CO2e/tonne-km
- **Last-Mile Delivery (Small Parcel Carrier - Van):** 0.181 kg CO2e per package
- **End-of-Life (Mixed Waste Landfill):** 0.3 kg CO2e/kg (for non-recyclable residual waste)

Detailed Emission Calculation per Stage (for 1.0 unit of exnqxstdxl):

Lifecycle Stage	GHG Scope	Calculation Details	Emissions (kg CO2e)
Materials Acquisition & Pre-processing	Scope 3 (Upstream)	Sum of \'Total Carbon\' from BOM.	2.395
Manufacturing (Purchased Electricity)	Scope 2	Energy Intensity (10 kWh/unit) × (1 - Renewable Usage 0.70) × China Grid EF (0.6205 kgCO2e/kWh)	1.8615
Transport (Inbound Logistics - Raw Materials)	Scope 3 (Upstream)	Total Raw Material Weight (0.00044 tonnes) × Transport Distance (500 km) × Heavy Duty Truck EF (0.07 kgCO2e/tkm)	0.0154

Lifecycle Stage	GHG Scope	Calculation Details	Emissions (kg CO2e)
Transport (Outbound Logistics - Last-Mile Delivery)	Scope 3 (Downstream)	Last-Mile Delivery EF (0.181 kgCO2e/package)	0.181
Use Phase	Scope 3 (Downstream)	Energy Consumption in Use (20 kWh/year) × Product Lifespan (5 years) × Assumed Grid EF (China: 0.6205 kgCO2e/kWh)	62.050
End-of-Life	Scope 3 (Downstream)	Total Product Weight (0.44 kg) × (1 - Recyclability 0.80) × Landfill EF (0.3 kgCO2e/kg)	0.0264

Total Product Carbon Footprint:

66.5293 kg CO2e per functional unit

GHG Protocol Scopes Summary:

GHG Scope	Description	Emissions (kg CO2e)	Percentage of Total
Scope 1	Direct emissions from owned or controlled sources (Not quantified in this 'factory_gate' boundary beyond direct process emissions already embedded in BOM, if any, for primary production stage - assumed negligible at company level for product PCF).	0.0000	0.00%
Scope 2	Indirect emissions from the generation of purchased energy (manufacturing electricity).	1.8615	2.80%
Scope 3	All other indirect emissions in the value chain (Materials, Transport, Use Phase, End-of-Life).	64.6678	97.20%

GHG Scope	Description	Emissions (kg CO2e)	Percentage of Total
Total PCF		66.5293	100.00%

2026 LSR Update Application: The Land Sector and Removals (LSR) Standard has been considered during this analysis. For exnqxstdxl, given its nature as a manufactured product with a factory_gate system boundary and the absence of direct land-use change data specific to its bill of materials or operations, significant direct land-based emissions or removals were not explicitly quantified. However, potential embedded land-use impacts within raw material supply chains are implicitly covered by the material emission factors.

Scope 3 Compliance: This report ensures comprehensive Scope 3 reporting, achieving at least 95% coverage, which exceeds the 2026 requirements. Major categories, including purchased goods and services (materials), upstream and downstream transportation, use of sold products, and end-of-life treatment of sold products, are included and detailed.

5. Review & Report

The calculated Product Carbon Footprint for exnqxstdxl is 66.53 kg CO2e per unit.

Emission Hotspots:

- **Use Phase:** The most significant hotspot is the use phase, accounting for approximately 93.27% of the total PCF. This is primarily due to the energy consumption of the product over its 5-year lifespan.
- **Materials:** Raw material acquisition and pre-processing represent the second largest contributor, at approximately 3.60% of the total PCF, driven by the carbon intensity of components like the Lithium-ion battery and PCB.
- **Manufacturing Energy:** Purchased electricity for manufacturing contributes about 2.80% to the total

footprint. The company's 70% renewable energy usage significantly mitigates this impact.

Reliability & Recommendations:

The analysis relies on provided primary data and reputable secondary emission factors. The high detail of the BOM and specific energy and logistics parameters enhance the accuracy. To further improve reliability and reduce the PCF, fedhpoiqly should:

- Focus on reducing energy consumption during the product's use phase through design optimization for energy efficiency.
- Explore lower-carbon alternatives for key materials, particularly those identified in the BOM as high-impact (e.g., electronics and certain plastics).
- Continue to increase renewable energy usage beyond 70% in manufacturing operations.
- Leverage the active take-back program to maximize actual recycling rates and explore opportunities for material reuse and closed-loop systems to minimize end-of-life impacts.