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Product Carbon Footprint Report

For Product: **jfuktelfwx**

Company: **edztyjhmjj**

Senior Sustainability Consultant: **fffhotujsy**

Protocol Data (Accounting Standard): **GHG Protocol**

Product Carbon Footprint Analysis

Generated Date: May 18, 2026

Executive Summary

This report presents a high-detail Product Carbon Footprint (PCF) analysis for the product **jfuktelfwx**, manufactured by **edztyjhmjj**. The analysis was conducted by Senior Sustainability Consultant **fffhotujsy**, adhering strictly to the GHG Protocol accounting standard, including the 2026 Land Sector and Removals (LSR) Update and the requirement for at least 95% Scope 3 coverage. The primary goal is to quantify the greenhouse gas (GHG) emissions across the product\'s lifecycle, identify emission hotspots, and provide a foundation for targeted sustainability improvements.

The PCF calculation covers the system boundary from \'factory_gate\', with a focus on a European supply chain for production inputs and final production in China. Emissions are categorized into Scope 1, 2, and 3, providing a comprehensive view of the product\'s environmental impact from raw material extraction to end-of-life.

Methodology

The Product Carbon Footprint (PCF) analysis for jfuktelfwx follows a five-step methodology in accordance with GHG Protocol standards:

1. **Define Scope:** Establishment of the functional unit, system boundaries, geographic scope, and allocation rules.

2. **Map Lifecycle (LCI Inventory Stages):** Identification of all relevant processes and stages throughout the product\'s lifecycle.
3. **Collect Data:** Gathering of primary and secondary data points for all identified lifecycle stages.
4. **Calculate Emissions:** Computation of GHG emissions by multiplying activity data with appropriate emission factors (Activity × Emission Factor = CO2e).
5. **Review & Report:** Analysis of results, identification of emission hotspots, assessment of data reliability, and final reporting.

GHG Protocol Adherence

- **Categorization:** 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 a company\'s value chain, both upstream and downstream).
- **2026 LSR Update:** The Land Sector and Removals (LSR) Standard principles have been considered for any relevant land-use and carbon removal impacts, though for this product PCF, direct land-use emissions are primarily accounted for through raw material acquisition.
- **Scope 3 Compliance:** A rigorous effort has been made to ensure at least 95% coverage for Scope 3 reporting, reflecting 2026 requirements for comprehensive value chain emissions.

PCF Parameters Overview

Parameter	Value	Notes
Company Name	edztyjhmjj	

Parameter	Value	Notes
Senior Sustainability Consultant	fffhotujsy	
Product Name	jfuktelfwx	
Accounting Standard	GHG Protocol	
Functional Unit	1.0 unit	
System Boundary	factory_gate	Emissions from raw material acquisition, manufacturing, and transport to the factory gate. For this report, downstream emissions (use and EoL) are also included for a more holistic view.
Geographic Scope	Final Production Country: China, Supply Chain Focus: Europe Focused	
Transport Mode (Illustrative)	Road Freight (Heavy Duty Truck)	Parameter provided: Select Mode. Assumed for calculation.
Transport Distance (Illustrative)	1,500 km	Parameter provided: psrnnzfsni. Assumed for calculation.
Last-Mile Delivery Channel (Illustrative)	Light Commercial Van	Parameter provided: Delivery Type. Assumed for calculation.
Renewable Energy Usage (Illustrative)	60%	Parameter provided: ojrwsnufqu. Assumed for calculation.
Energy Intensity (kWh/unit) (Illustrative)	10 kWh/unit	Parameter provided: jfwkuvknmi. Assumed for calculation.

Parameter	Value	Notes
Product Lifespan (Illustrative)	3 years	Parameter provided: wzqxeorgeu. Assumed for calculation.
Energy Consumption in Use (Illustrative)	5 kWh/year	Parameter provided: htztsxrovk. Assumed for calculation.
Recyclability Percentage (Illustrative)	75%	Parameter provided: juzqrprmxz. Assumed for calculation.
Circular/Take-back Programs	usnzvhokhi (Presence Acknowledged)	

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

Detailed Bill of Materials (BOM) for jfuktelfwx

The following Bill of Materials (BOM) provides a detailed breakdown of the product\'s components, including their quantity, unit, emission factor, and total carbon footprint. These specific values (provided as dmfhxmzg) are directly used for material impact calculation.

ID	Description	Category	Process	Qty	Unit	Emission Factor (kg CO2e/ unit or kg)	Total Carbon (kg CO2e)
1	Aluminum Casing	Metal	Casting	0.5	kg	7.5	3.75

ID	Description	Category	Process	Qty	Unit	Emission Factor (kg CO2e/ unit or kg)	Total Carbon (kg CO2e)
2	PCB	Electronics	Assembly	1	unit	2.1	2.10
3	Lithium-ion Battery	Chemical	Manufacturing	0.2	kg	15.0	3.00
4	Plastic Buttons	Polymer	Injection Molding	0.05	kg	2.2	0.11

Total Material Carbon from BOM: 8.96 kg CO2e

Energy Inputs - Production Phase

- **Renewable Energy Usage (ojrwsnufqu):** The production facility utilizes 60% renewable energy (illustrative). This significantly reduces the emissions associated with purchased electricity.
- **Energy Intensity (jfwkuvknmi):** The manufacturing process for one unit of jfuktelfwx consumes an illustrative 10 kWh of electricity.
- **Geographic Scope for Energy:** Final production in China. The average electricity grid emission factor for China is approximately 0.5 kg CO2e/kWh, considering 2026 trends and a mix of sources.

Logistics Data - Transportation

- **Transport Mode (Select Mode):** For primary transportation from the European focused supply chain to the final production country (China), Road Freight (Heavy Duty Truck) is assumed (illustrative).
- **Transport Distance (psrnnzfsni):** An illustrative distance of 1,500 km is used for primary transport.

- **Last-Mile Delivery Channel (Delivery Type):** An illustrative Light Commercial Van is assumed for last-mile distribution to the customer.
- **Emission Factors:**
  - Road Freight (Heavy Duty Truck): 0.1 kg CO2e/tkm (illustrative).
  - Light Commercial Van (Last-Mile): 0.05 kg CO2e per unit (illustrative, acknowledging typical vehicle emissions and load allocation).

Product Durability and Consumption - Use Phase

- **Product Lifespan (wzqxeorgeu):** The product jfuktelfwx has an illustrative lifespan of 3 years.
- **Energy Consumption in Use (htztsxrovk):** During its operational life, the product consumes an illustrative 5 kWh of energy per year. This energy consumption is accounted for as part of the downstream Scope 3 emissions.

End-of-Life (EoL) Scenarios

- **Recyclability Percentage (juzqrprmxz):** An illustrative 75% of the product\'s materials are considered recyclable at end-of-life.
- **Circular/Take-back Programs (usnzvhokhi):** The company **edztyjhmjj** has circular/take-back programs in place, which facilitates material recovery and minimizes waste. The presence of such programs supports higher recycling rates and can contribute to significant emission reductions through avoided virgin material production.
- **EoL Treatment:** For the recycled portion, a credit is applied based on avoided virgin material production. For the non-recycled portion, a minor burden for disposal (landfill/incineration) is considered.

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

This section details the calculation of emissions across the product lifecycle, categorized by GHG Protocol scopes. All calculations are based on the provided and illustrative parameters.

Scope 1: Direct Emissions

Given the \'factory_gate\' system boundary and the nature of the product, direct Scope 1 emissions (e.g., from on-site fuel combustion) are assumed to be negligible for the functional unit of 1.0 unit of jfuktelfwx, as the primary focus is on purchased materials and energy for manufacturing. Should the facility have significant direct emissions related to the production of jfuktelfwx (e.g., owned fleet for internal transport, on-site boilers), these would be quantified here.

Scope 2: Energy Indirect Emissions (Purchased Electricity)

These emissions arise from the generation of purchased electricity used in the manufacturing process in China.

- Total Energy Intensity: 10 kWh/unit (illustrative for jfwkuvknmi)
- Renewable Energy Usage: 60% (illustrative for ojrwsnufqu)
- Non-renewable Electricity Consumption: 10 kWh/unit * (1 - 0.60) = 4 kWh/unit
- China Grid Emission Factor: 0.5 kg CO2e/kWh (illustrative based on 2026 data trends).
- **Scope 2 Emissions:** 4 kWh/unit * 0.5 kg CO2e/kWh = **2.00 kg CO2e/unit**

Scope 3: Value Chain Indirect Emissions

Scope 3 emissions constitute the majority of the product\'s footprint and are broken down by upstream and downstream activities. A coverage of at least 95% is targeted as per 2026 requirements.

Upstream Scope 3 Emissions

Materials (Cradle-to-Gate)

Emissions associated with the extraction, processing, and manufacturing of raw materials, as per the Detailed Bill of Materials (BOM).

- Total Carbon from BOM (dmfhxmzg): **8.96 kg CO2e/unit**

Transportation (Upstream)

Emissions from transporting raw materials and components from Europe (supply chain focus) to the final production facility in China.

- Product Weight (for transport): Assuming an illustrative total product weight of 1 kg (including packaging for the unit of jfuktelfwx) for transport calculations.
- Transport Distance (psrnnzfsni): 1,500 km (illustrative)
- Transport Mode (Select Mode): Road Freight (Heavy Duty Truck)
- Emission Factor: 0.1 kg CO2e/tkm
- **Transportation Emissions (Upstream):** 1 kg * (1500 km / 1000 kg/tonne) * 0.1 kg CO2e/tkm = **0.15 kg CO2e/unit**

Downstream Scope 3 Emissions

Use Phase

Emissions from the energy consumption of the product during its lifespan. The electricity grid mix where the product is used would typically be a global average or specific regional grid for calculation; here, we\'ll use an illustrative average for consistency.

- Product Lifespan (wzqxeorgeu): 3 years (illustrative)
- Energy Consumption in Use (htztsxrovk): 5 kWh/year (illustrative)
- Illustrative Average Electricity Grid Emission Factor (global average for use phase): 0.5 kg CO2e/kWh (assuming diverse user locations).
- Annual Use Phase Emissions: 5 kWh/year * 0.5 kg CO2e/kWh = 2.5 kg CO2e/year
- **Total Use Phase Emissions:** 2.5 kg CO2e/year * 3 years = **7.50 kg CO2e/unit**

End-of-Life (EoL) Treatment

Emissions and avoided emissions (credits) associated with the end-of-life management of the product. The 2026 LSR Update principles are applied by considering the potential for carbon removals through recycling.

- Total Material Emissions (virgin equivalent): 8.96 kg CO2e/unit
- Recyclability Percentage (juzqrprmxz): 75% (illustrative)
- Portion Recycled: 8.96 kg CO2e * 0.75 = 6.72 kg CO2e

- Recycling Benefit: Assuming a 60% reduction in virgin material impacts for the recycled portion as a credit (illustrative, acknowledging energy savings from recycling).
    - Credit from Recycling: - (6.72 kg CO2e * 0.60) = **-4.03 kg CO2e/unit**
- Portion Not Recycled: 8.96 kg CO2e * 0.25 = 2.24 kg CO2e
- Disposal Burden (for non-recycled portion): Assuming an illustrative 5% burden of the virgin material equivalent for landfill/incineration.
    - Burden from Disposal: 2.24 kg CO2e * 0.05 = **0.11 kg CO2e/unit**
- **Net End-of-Life Emissions:** -4.03 + 0.11 = **-3.92 kg CO2e/unit** (a net credit due to significant recycling)

Last-Mile Delivery

Emissions from the last segment of the supply chain, delivering the product to the end-customer.

- Last-Mile Delivery Channel (Delivery Type): Light Commercial Van (illustrative)
- **Last-Mile Delivery Emissions:** 0.05 kg CO2e/unit (illustrative, assumed fixed per unit due to lack of specific tkm data for individual parcel delivery)

Total Product Carbon Footprint (PCF) Summary

Emission Category	GHG Scope	Calculated CO2e (kg/unit)
Manufacturing Process (Direct)	Scope 1	0.00
Purchased Electricity (Manufacturing)	Scope 2	2.00
Materials (Upstream)	Scope 3	8.96
Transportation (Upstream)	Scope 3	0.15

Emission Category	GHG Scope	Calculated CO2e (kg/ unit)
Use Phase (Downstream)	Scope 3	7.50
End-of-Life Treatment (Downstream)	Scope 3	-3.92
Last-Mile Delivery (Downstream)	Scope 3	0.05
TOTAL PRODUCT CARBON FOOTPRINT (PCF)		**14.74**

> **Total PCF for jfuktelfwx: 14.74 kg CO2e per unit**

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5. Review & Report

Emission Hotspots

Based on the analysis, the primary emission hotspots for **jfuktelfwx** are:

- **Materials (Upstream Scope 3):** Representing the largest portion of the footprint at 8.96 kg CO2e/unit, this highlights the significant impact of raw material extraction and processing. The Lithium-ion Battery and Aluminum Casing, with higher emission factors, are key contributors.
- **Use Phase (Downstream Scope 3):** With 7.50 kg CO2e/ unit, the energy consumption during the product\'s 3-year lifespan is a substantial contributor, emphasizing the importance of energy efficiency.
- **Purchased Electricity (Scope 2):** Although 60% renewable energy is used, the remaining non-renewable electricity still contributes 2.00 kg CO2e/unit, indicating that further decarbonization of the energy mix or improved energy efficiency in manufacturing could yield benefits.

Reliability Assessment

The reliability of this PCF analysis is high for the material component due to the provision of a detailed Bill of Materials with specific emission factors. However, for parameters like Transport Mode/Distance, Renewable Energy Usage, Energy Intensity, Product Lifespan, Energy Consumption in Use, Recyclability Percentage, and Last-Mile Delivery Channel, illustrative values were used as placeholder inputs (e.g., psrnnzfsni, ojrwsnufqu, jfwkuvknmi, wzqxeorgeu, htztsxrovk, juzqrprmxz, usnzvhokhi). For a more precise and accurate PCF, primary data for these specific activities and the actual grid mix for the use phase would be required. The assumed illustrative emission factors for transportation and electricity were derived from industry-standard databases (e.g., Ecoinvent/DEFRA principles) and current trends.

Key Findings and Recommendations

- The total Product Carbon Footprint for one unit of jfuktelfwx is **14.74 kg CO2e**.
- Upstream material impacts are the dominant factor. **Recommendation:** Investigate opportunities for using lower-carbon materials, increasing recycled content in components like the aluminum casing and plastic parts, and engaging with suppliers to reduce their emissions.
- The Use Phase is the second largest contributor. **Recommendation:** Explore design improvements for enhanced energy efficiency of jfuktelfwx during its operational life. Provide users with guidance on sustainable energy sourcing if applicable.
- The positive impact of circular economy initiatives is evident through the net credit from End-of-Life activities. **Recommendation:** Continue to strengthen circular/take-back programs (usnzvhokhi) and explore design-for-recyclability to maximize material recovery and further reduce overall footprint.

- Further reduction in Scope 2 emissions can be achieved by increasing the percentage of renewable energy used in the manufacturing facility beyond the current illustrative 60% (ojrwsnufqu) or by investing in energy efficiency measures.
- For future analyses, gathering specific primary data for transportation distances, modes, and last-mile delivery mechanisms would enhance accuracy significantly.
