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Product Carbon Footprint Report

Product: wpptyiktvp

Protocol Data (Accounting Standard): GHG Protocol

Name of the Company: hiuhojinom

Senior Sustainability Consultant: ztqvryiemi

Disclaimer: This report is generated based on available data and industry standards. While efforts have been made to ensure accuracy and adherence to the specified parameters, specific real-world values may vary. This analysis relies on the provided parameters and illustrative emission factors where primary data was not available.

Product Carbon Footprint Report for wpptyiktvp

Generated Date: May 16, 2026

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1. Executive Summary

This report presents a high-detail Product Carbon Footprint (PCF) analysis for the product **wpptyiktvp**, manufactured by **hiuhojinom**. The analysis was conducted by **ztqvryiemi**, a Senior Sustainability Consultant specializing in GHG Protocol. The PCF quantifies the total greenhouse gas (GHG) emissions associated with the product\'s entire lifecycle, from raw material extraction to end-of-life, adhering to the GHG Protocol Product Standard, including considerations for the 2026 Land Sector and Removals (LSR) Update and robust Scope 3 compliance. This report identifies key emission hotspots and provides a comprehensive overview of the environmental impact of **wpptyiktvp**.

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2. Introduction

This Product Carbon Footprint (PCF) report details the greenhouse gas emissions associated with **wpptyiktvp**, a product of **hiuhojinom**. The assessment follows the Greenhouse Gas Protocol\'s Product Life Cycle Accounting and Reporting Standard. The Senior Sustainability Consultant responsible for this analysis is **ztqvryiemi**.

2.1. Product and Company Details

- **Company Name:** hiuhojinom
- **Product Name:** wpptyiktvp
- **Senior Sustainability Consultant:** ztqvryiemi
- **Functional Unit:** 1.0 unit of wpptyiktvp

- **System Boundary:** Cradle-to-grave, with primary focus on factory-gate for production and subsequent phases analyzed.
- **Geographic Scope:** Final Production Country: China, Supply Chain Focus: Europe Focused
- **Accounting Standard:** GHG Protocol

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3. Methodology

The Product Carbon Footprint (PCF) for **wpptyiktvp** was calculated following a five-step methodology in accordance with the GHG Protocol Product Standard, ensuring transparency and accuracy.

3.1. Step 1: Define Scope

This step establishes the boundaries and assumptions for the PCF study.

- **Functional Unit:** The reference flow for this analysis is 1.0 unit of **wpptyiktvp**.
- **System Boundaries:** A cradle-to-grave approach was adopted, encompassing all life cycle stages from raw material acquisition, manufacturing, transport, use phase, to end-of-life. Although the primary system boundary for direct manufacturing focus is \'factory_gate\', the report extends to cover the full lifecycle as per the provided parameters for use-phase and end-of-life.
- **Geographic Scope:** Production occurs in China, with a supply chain focus on Europe for material sourcing and distribution.
- **Allocation:** Where necessary, emissions have been allocated directly to the functional unit. No co-products requiring complex allocation were identified for this specific product analysis.

3.2. Step 2 & 3: Map Lifecycle (LCI Inventory Stages) & Collect Data

Detailed data was collected across all identified lifecycle stages. This involved quantifying material inputs, energy consumption, transportation, and end-of-life processes.

3.2.1. Detailed Bill of Materials (BOM) - zsflwuxn

The following Bill of Materials (BOM) was used to calculate the material acquisition and processing impacts. The "Total Carbon" column represents the pre-calculated emissions for each material item, in kg CO2e.

ID	Description	Category	Process	Qty	Unit	Emission Factor (kgCO2e/ Unit)	Total Carbon (kgCO2e)
M001	Aluminum Casing	Metal	Casting	0.2	kg	12.0	2.40
M002	Plastic Housing	Plastic	Injection Molding	0.3	kg	3.5	1.05
M003	Circuit Board	Electronics	Assembly	0.05	unit	20.0	1.00
M004	Copper Wire	Metal	Drawing	0.1	kg	5.0	0.50
M005	Lithium-ion Battery	Chemical	Manufacturing	0.08	unit	25.0	2.00
M006	Packaging Cardboard	Paper	Pulping & Forming	0.1	kg	1.5	0.15

Total Material Carbon Footprint: 7.10 kg CO2e

3.2.2. Energy Inputs (Production Phase)

- **Energy Intensity (kWh/unit):** 7.5 kWh/unit
- **Renewable Energy Usage:** 60%
- **Non-renewable Energy Usage:** 40%

3.2.3. Logistics Data

- **Primary Transport Mode (Materials to Factory, Finished Product to EU Hub):** Road Freight (Heavy Goods Vehicle)
- **Primary Transport Distance (Average):** 1500 km (for raw materials and distribution to EU hub)

- **Last-Mile Delivery Channel:** Courier Van
- **Last-Mile Delivery Distance (Average):** 150 km

3.2.4. Use Phase Data

- **Product Lifespan:** 4 years
- **Energy Consumption in Use:** 3 kWh/year
- **Total Use Phase Energy Consumption:** 3 kWh/year * 4 years = 12 kWh

3.2.5. End-of-Life (EoL) Scenarios

- **Recyclability Percentage:** 75%
- **Circular/Take-back Programs:** Yes, established take-back program with 15% return rate. This program is assumed to facilitate the recycling of the recyclable portion. The remaining unrecycled portion is assumed to be disposed of (e.g., incineration).

3.2.6. Emission Factors (Illustrative, based on industry standards like Ecoinvent/DEFRA for calculation demonstration)

- China Grid Electricity (non-renewable average): 0.6 kg CO2e/kWh
- EU Grid Electricity (average for use phase): 0.3 kg CO2e/kWh
- Road Freight (HGV, >16t, Euro VI, average load): 0.08 kg CO2e/tonne-km
- Courier Van (last-mile, per delivery): 0.3 kg CO2e/delivery (assumed for one unit of product)
- Incineration of unrecycled waste: 0.5 kg CO2e/kg
- Product Weight for transport/EoL (approximate, including packaging): 1.0 kg (0.001 tonne)

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4. Step 4: Calculate Emissions

Emissions were calculated by multiplying activity data by relevant emission factors. Emissions are categorized according to the GHG Protocol scopes.

4.1. Scope 1 Emissions (Direct Emissions)

Direct GHG emissions from sources owned or controlled by the reporting company. For the production of **wpptyiktvp**, on-site fuel combustion for minor processes (e.g., heating) is assumed to contribute a small amount. Given no specific data, an estimate is provided for illustrative purposes.

- **Estimated Scope 1 Emissions:** 0.05 kg CO2e

4.2. Scope 2 Emissions (Purchased Energy)

Indirect GHG emissions from the generation of purchased electricity, steam, heat, or cooling consumed by the reporting company.

- Total Energy Intensity: 7.5 kWh/unit
- Renewable Energy Used: 7.5 kWh * 60% = 4.5 kWh
- Non-renewable Energy Used: 7.5 kWh * 40% = 3.0 kWh
- Emissions from non-renewable electricity: 3.0 kWh * 0.6 kg CO2e/kWh (China grid EF) = 1.80 kg CO2e
- **Total Scope 2 Emissions:** 1.80 kg CO2e

4.3. Scope 3 Emissions (Value Chain Emissions)

All other indirect emissions that occur in a company’s value chain. This category typically represents the largest portion of a product\'s carbon footprint.

4.3.1. Upstream Emissions

- **Materials Acquisition & Processing (Category 1 - Purchased Goods and Services):**
  - Total from BOM: 7.10 kg CO2e

- **Transportation and Distribution (Category 4 - Upstream Transportation and Distribution):**
  - Primary Transport (materials to factory): 0.001 tonne * 1500 km * 0.08 kg CO2e/tonne-km = 0.12 kg CO2e
  - **Total Upstream Transport Emissions:** 0.12 kg CO2e
- **Other Upstream (e.g., waste generated in operations, investments):** Assumed negligible or captured within material EFs.
- **Total Upstream Emissions: 7.10 + 0.12 = 7.22 kg CO2e**

4.3.2. Downstream Emissions

- **Transportation and Distribution (Category 4 - Downstream Transportation and Distribution):**
  - Distribution to EU Hub (finished product): 0.001 tonne * 1500 km * 0.08 kg CO2e/tonne-km = 0.12 kg CO2e
  - Last-Mile Delivery (Courier Van): 1 delivery * 0.3 kg CO2e/ delivery = 0.30 kg CO2e
  - **Total Downstream Transport Emissions:** 0.12 + 0.30 = 0.42 kg CO2e
- **Use Phase Emissions (Category 11 - Use of Sold Products):**
  - Total energy consumption: 12 kWh
  - Emissions: 12 kWh * 0.3 kg CO2e/kWh (EU grid EF) = 3.60 kg CO2e
- **End-of-Life Treatment (Category 12 - End-of-Life Treatment of Sold Products):**
  - Product weight: 1.0 kg
  - Recycled portion: 1.0 kg * 75% = 0.75 kg (avoided emissions considered implicitly or through reduced virgin material demand)
  - Take-back program effectiveness (15% return rate beyond general recyclability implies a robust collection system for the recyclable part).
  - Non-recycled/Disposed portion: 1.0 kg * (1 - 75%) = 0.25 kg

    - Emissions from disposal (e.g., incineration): 0.25 kg * 0.5 kg CO2e/kg = 0.125 kg CO2e
    - **Total End-of-Life Emissions:** 0.125 kg CO2e
- **Total Downstream Emissions: 0.42 + 3.60 + 0.125 = 4.145 kg CO2e**

4.4. Total Product Carbon Footprint (PCF) for wpptyiktvp

The summation of emissions across all scopes and life cycle stages yields the total PCF for one unit of **wpptyiktvp**.

Emission Scope/Category	Total CO2e (kg)	Percentage (%)
Scope 1 (Direct Emissions - Manufacturing)	0.05	0.3%
Scope 2 (Purchased Electricity - Manufacturing)	1.80	11.0%
Scope 3 - Upstream: Materials Acquisition & Processing	7.10	43.4%
Scope 3 - Upstream: Transport (Materials to Factory)	0.12	0.7%
Scope 3 - Downstream: Transport (Distribution to End-User)	0.42	2.6%
Scope 3 - Downstream: Use Phase (Energy Consumption)	3.60	22.0%
Scope 3 - Downstream: End-of-Life Treatment	0.125	0.8%
TOTAL PCF per unit	**16.315**	**100.0%**

The total Product Carbon Footprint for one unit of wpptyiktvp is approximately 16.32 kg CO2e.

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5. GHG Protocol Scopes Breakdown

In accordance with the GHG Protocol, emissions are categorized as follows:

- **Scope 1: Direct GHG Emissions (0.05 kg CO2e):** Emissions from operations directly owned or controlled by hiuhojinom, primarily minor on-site combustion during manufacturing.
- **Scope 2: Indirect GHG Emissions from Purchased Energy (1.80 kg CO2e):** Emissions from the generation of purchased electricity used in the manufacturing facilities of hiuhojinom for wpptyiktvp.
- **Scope 3: Other Indirect GHG Emissions (14.465 kg CO2e):** Encompasses all other indirect emissions occurring in the value chain, which for wpptyiktvp includes:
    - Upstream: Raw material extraction and processing, upstream transportation of materials.
    - Downstream: Transportation and distribution of finished products, energy consumption during the product\'s use phase, and end-of-life treatment.

5.1. 2026 LSR Update Application

The Land Sector and Removals (LSR) Standard (2026 Update) aims to incorporate emissions and removals from land use and land-use change. For this specific product PCF of **wpptyiktvp**, and given the provided data, direct land-use change emissions or significant biomass carbon removals associated with its immediate material inputs or manufacturing processes were not explicitly identified or quantifiable without further primary data. However, the framework of the LSR Update is acknowledged, and for future, more granular analyses, relevant land-based impacts (e.g., specific agricultural inputs, deforestation links to raw materials) would be integrated. At this level of analysis, the impact from LSR is assumed to be negligible or embedded within general material emission factors.

5.2. Scope 3 Compliance

This analysis diligently addresses Scope 3 emissions, covering critical upstream and downstream activities including raw materials,

manufacturing (indirect), all relevant transportation stages, product use phase, and end-of-life. With a detailed Bill of Materials, specific energy data, and explicit consideration of logistics, use-phase, and EoL, the report demonstrates a robust effort to achieve at least 95% coverage for Scope 3 reporting, in line with 2026 requirements.

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6. Step 5: Review & Report

6.1. Emission Hotspots

The analysis identifies the following key emission hotspots for **wpptyiktvp**:

- **Materials Acquisition & Processing (43.4%):** The extraction and processing of raw materials, particularly the aluminum casing and lithium-ion battery, constitute the largest single contributor to the product\'s carbon footprint. This highlights the importance of sustainable sourcing and material efficiency.
- **Use Phase Energy Consumption (22.0%):** The energy consumed by the product during its 4-year lifespan significantly contributes to its overall footprint, driven by the electricity mix of the region where it is used (assumed EU average). Improving product energy efficiency is crucial here.
- **Manufacturing (Scope 2, 11.0%):** Purchased electricity for the manufacturing process is a notable hotspot. Increasing the share of renewable energy at the production facility in China offers a direct pathway for reduction.

6.2. Reliability Statement

This report is based on the parameters and data provided by **hiuhojinom**, augmented with illustrative industry-standard emission factors from reputable databases (e.g., general DEFRA/Ecoinvent categories) where primary data was unavailable or specified as placeholders. The methodology adheres strictly to the GHG Protocol Product Standard. While efforts have been made to ensure accuracy, the quantitative results are dependent on the quality and completeness of the input data and the assumptions made for

generic emission factors. The report provides a robust baseline for identifying hotspots and informs strategies for emission reduction.

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7. Conclusion & Recommendations

The Product Carbon Footprint for **wpptyiktvp** is 16.32 kg CO2e per unit. This comprehensive analysis highlights that material choices and the energy consumption during the product\'s use phase are the most significant drivers of its environmental impact.

Recommendations for hiuhojinom:

- **Material Optimization:** Investigate alternative, lower-carbon materials for components like the aluminum casing and battery. Explore lightweighting opportunities and increased recycled content.
- **Manufacturing Energy Transition:** Accelerate the transition to 100% renewable energy for manufacturing operations in China, directly reducing Scope 2 emissions.
- **Product Energy Efficiency:** Focus on design improvements to reduce the energy consumption of **wpptyiktvp** during its use phase, especially targeting regions with higher carbon intensity grids.
- **Enhanced Circularity:** Leverage the established take-back program to maximize material recovery and explore opportunities for component reuse or remanufacturing beyond basic recycling.
- **Supplier Engagement:** Collaborate with suppliers to improve transparency on upstream emissions and encourage their decarbonization efforts.

Product Carbon Footprint Report

Product: wpptyiktvp

Protocol Data (Accounting Standard): GHG Protocol

Name of the Company: hiuhojinom

Senior Sustainability Consultant: ztqvryiemi

Disclaimer: This report is generated based on available data and industry standards. While efforts have been made to ensure accuracy and adherence to the specified parameters, specific real-world values may vary. This analysis relies on the provided parameters and illustrative emission factors where primary data was not available.

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1. Executive Summary

This report presents a high-detail Product Carbon Footprint (PCF) analysis for the product **wpptyiktvp**, manufactured by **hiuhojinom**. The analysis was conducted by **ztqvryiemi**, a Senior Sustainability Consultant specializing in GHG Protocol. The PCF quantifies the total greenhouse gas (GHG) emissions associated with the product\'s entire lifecycle, from raw material extraction to end-of-life, adhering to the GHG Protocol Product Standard, including considerations for the 2026 Land Sector and Removals (LSR) Update and robust Scope 3 compliance. This report identifies key emission hotspots and provides a comprehensive overview of the environmental impact of **wpptyiktvp**.

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2. Introduction

This Product Carbon Footprint (PCF) report details the greenhouse gas emissions associated with **wpptyiktvp**, a product of **hiuhojinom**. The assessment follows the Greenhouse Gas Protocol\'s Product Life Cycle Accounting and Reporting Standard. The Senior Sustainability Consultant responsible for this analysis is **ztqvryiemi**.

2.1. Product and Company Details

- **Company Name:** hiuhojinom
- **Product Name:** wpptyiktvp
- **Senior Sustainability Consultant:** ztqvryiemi
- **Functional Unit:** 1.0 unit of wpptyiktvp

- **System Boundary:** Cradle-to-grave, with primary focus on factory-gate for production and subsequent phases analyzed.
- **Geographic Scope:** Final Production Country: China, Supply Chain Focus: Europe Focused
- **Accounting Standard:** GHG Protocol

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3. Methodology

The Product Carbon Footprint (PCF) for **wpptyiktvp** was calculated following a five-step methodology in accordance with the GHG Protocol Product Standard, ensuring transparency and accuracy.

3.1. Step 1: Define Scope

This step establishes the boundaries and assumptions for the PCF study.

- **Functional Unit:** The reference flow for this analysis is 1.0 unit of **wpptyiktvp**.
- **System Boundaries:** A cradle-to-grave approach was adopted, encompassing all life cycle stages from raw material acquisition, manufacturing, transport, use phase, to end-of-life. Although the primary system boundary for direct manufacturing focus is \'factory_gate\', the report extends to cover the full lifecycle as per the provided parameters for use-phase and end-of-life.
- **Geographic Scope:** Production occurs in China, with a supply chain focus on Europe for material sourcing and distribution.
- **Allocation:** Where necessary, emissions have been allocated directly to the functional unit. No co-products requiring complex allocation were identified for this specific product analysis.

3.2. Step 2 & 3: Map Lifecycle (LCI Inventory Stages) & Collect Data

Detailed data was collected across all identified lifecycle stages. This involved quantifying material inputs, energy consumption, transportation, and end-of-life processes.

3.2.1. Detailed Bill of Materials (BOM) - zsflwuxn

The following Bill of Materials (BOM) was used to calculate the material acquisition and processing impacts. The "Total Carbon" column represents the pre-calculated emissions for each material item, in kg CO2e.

ID	Description	Category	Process	Qty	Unit	Emission Factor (kgCO2e/ Unit)	Total Carbon (kgCO2e)
M001	Aluminum Casing	Metal	Casting	0.2	kg	12.0	2.40
M002	Plastic Housing	Plastic	Injection Molding	0.3	kg	3.5	1.05
M003	Circuit Board	Electronics	Assembly	0.05	unit	20.0	1.00
M004	Copper Wire	Metal	Drawing	0.1	kg	5.0	0.50
M005	Lithium-ion Battery	Chemical	Manufacturing	0.08	unit	25.0	2.00
M006	Packaging Cardboard	Paper	Pulping & Forming	0.1	kg	1.5	0.15

Total Material Carbon Footprint: 7.10 kg CO2e

3.2.2. Energy Inputs (Production Phase)

- **Energy Intensity (kWh/unit):** 7.5 kWh/unit
- **Renewable Energy Usage:** 60%
- **Non-renewable Energy Usage:** 40%

3.2.3. Logistics Data

- **Primary Transport Mode (Materials to Factory, Finished Product to EU Hub):** Road Freight (Heavy Goods Vehicle)
- **Primary Transport Distance (Average):** 1500 km (for raw materials and distribution to EU hub)

- **Last-Mile Delivery Channel:** Courier Van
- **Last-Mile Delivery Distance (Average):** 150 km

3.2.4. Use Phase Data

- **Product Lifespan:** 4 years
- **Energy Consumption in Use:** 3 kWh/year
- **Total Use Phase Energy Consumption:** 3 kWh/year * 4 years = 12 kWh

3.2.5. End-of-Life (EoL) Scenarios

- **Recyclability Percentage:** 75%
- **Circular/Take-back Programs:** Yes, established take-back program with 15% return rate. This program is assumed to facilitate the recycling of the recyclable portion. The remaining unrecycled portion is assumed to be disposed of (e.g., incineration).

3.2.6. Emission Factors (Illustrative, based on industry standards like Ecoinvent/DEFRA for calculation demonstration)

- China Grid Electricity (non-renewable average): 0.6 kg CO2e/kWh.
- EU Grid Electricity (average for use phase): 0.28 kg CO2e/kWh.
- Road Freight (HGV, >16t, Euro VI, average load): 0.07 kg CO2e/tonne-km.
- Courier Van (last-mile, per delivery): 0.3 kg CO2e/delivery (illustrative estimate).
- Incineration of unrecycled waste (fossil carbon): 0.5 kg CO2e/kg.
- Product Weight for transport/EoL (approximate, including packaging): 1.0 kg (0.001 tonne)

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4. Step 4: Calculate Emissions

Emissions were calculated by multiplying activity data by relevant emission factors. Emissions are categorized according to the GHG Protocol scopes.

4.1. Scope 1 Emissions (Direct Emissions)

Direct GHG emissions from sources owned or controlled by the reporting company. For the production of **wpptyiktvp**, on-site fuel combustion for minor processes (e.g., heating) is assumed to contribute a small amount. Given no specific data, an estimate is provided for illustrative purposes.

- **Estimated Scope 1 Emissions:** 0.05 kg CO2e

4.2. Scope 2 Emissions (Purchased Energy)

Indirect GHG emissions from the generation of purchased electricity, steam, heat, or cooling consumed by the reporting company.

- Total Energy Intensity: 7.5 kWh/unit
- Renewable Energy Used: 7.5 kWh * 60% = 4.5 kWh
- Non-renewable Energy Used: 7.5 kWh * 40% = 3.0 kWh
- Emissions from non-renewable electricity: 3.0 kWh * 0.6 kg CO2e/kWh (China grid EF) = 1.80 kg CO2e.
- **Total Scope 2 Emissions:** 1.80 kg CO2e

4.3. Scope 3 Emissions (Value Chain Emissions)

All other indirect emissions that occur in a company’s value chain. This category typically represents the largest portion of a product\'s carbon footprint.

4.3.1. Upstream Emissions

- **Materials Acquisition & Processing (Category 1 - Purchased Goods and Services):**
  - Total from BOM: 7.10 kg CO2e

- **Transportation and Distribution (Category 4 - Upstream Transportation and Distribution):**
  - Primary Transport (materials to factory): 0.001 tonne * 1500 km * 0.07 kg CO2e/tonne-km = 0.105 kg CO2e.
  - **Total Upstream Transport Emissions:** 0.105 kg CO2e
- **Other Upstream (e.g., waste generated in operations, investments):** Assumed negligible or captured within material EFs.
- **Total Upstream Emissions: 7.10 + 0.105 = 7.205 kg CO2e**

4.3.2. Downstream Emissions

- **Transportation and Distribution (Category 4 - Downstream Transportation and Distribution):**
  - Distribution to EU Hub (finished product): 0.001 tonne * 1500 km * 0.07 kg CO2e/tonne-km = 0.105 kg CO2e.
  - Last-Mile Delivery (Courier Van): 1 delivery * 0.3 kg CO2e/delivery = 0.30 kg CO2e
  - **Total Downstream Transport Emissions:** 0.105 + 0.30 = 0.405 kg CO2e
- **Use Phase Emissions (Category 11 - Use of Sold Products):**
  - Total energy consumption: 12 kWh
  - Emissions: 12 kWh * 0.28 kg CO2e/kWh (EU grid EF) = 3.36 kg CO2e.
- **End-of-Life Treatment (Category 12 - End-of-Life Treatment of Sold Products):**
  - Product weight: 1.0 kg
  - Recycled portion: 1.0 kg * 75% = 0.75 kg (avoided emissions considered implicitly or through reduced virgin material demand)
  - Take-back program effectiveness (15% return rate beyond general recyclability implies a robust collection system for the recyclable part).
  - Non-recycled/Disposed portion: 1.0 kg * (1 - 75%) = 0.25 kg

    - Emissions from disposal (e.g., incineration of fossil carbon): 0.25 kg * 0.5 kg CO2e/kg = 0.125 kg CO2e.
    - **Total End-of-Life Emissions:** 0.125 kg CO2e
- **Total Downstream Emissions: 0.405 + 3.36 + 0.125 = 3.89 kg CO2e**

4.4. Total Product Carbon Footprint (PCF) for wpptyiktvp

The summation of emissions across all scopes and life cycle stages yields the total PCF for one unit of **wpptyiktvp**.

Emission Scope/Category	Total CO2e (kg)	Percentage (%)
Scope 1 (Direct Emissions - Manufacturing)	0.050	0.4%
Scope 2 (Purchased Electricity - Manufacturing)	1.800	13.9%
Scope 3 - Upstream: Materials Acquisition & Processing	7.100	54.8%
Scope 3 - Upstream: Transport (Materials to Factory)	0.105	0.8%
Scope 3 - Downstream: Transport (Distribution to End-User)	0.405	3.1%
Scope 3 - Downstream: Use Phase (Energy Consumption)	3.360	25.9%
Scope 3 - Downstream: End-of-Life Treatment	0.125	1.0%
TOTAL PCF per unit	**12.945**	**100.0%**

The total Product Carbon Footprint for one unit of wpptyiktvp is approximately 12.95 kg CO2e.

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5. GHG Protocol Scopes Breakdown

In accordance with the GHG Protocol, emissions are categorized as follows:

- **Scope 1: Direct GHG Emissions (0.05 kg CO2e):** Emissions from operations directly owned or controlled by hiuhojinom, primarily minor on-site combustion during manufacturing.
- **Scope 2: Indirect GHG Emissions from Purchased Energy (1.80 kg CO2e):** Emissions from the generation of purchased electricity used in the manufacturing facilities of hiuhojinom for wpptyiktvp.
- **Scope 3: Other Indirect GHG Emissions (11.095 kg CO2e):** Encompasses all other indirect emissions occurring in the value chain, which for wpptyiktvp includes:
    - Upstream: Raw material extraction and processing, upstream transportation of materials.
    - Downstream: Transportation and distribution of finished products, energy consumption during the product\'s use phase, and end-of-life treatment.

5.1. 2026 LSR Update Application

The Land Sector and Removals (LSR) Standard (2026 Update) aims to incorporate emissions and removals from land use and land-use change. For this specific product PCF of **wpptyiktvp**, and given the provided data, direct land-use change emissions or significant biomass carbon removals associated with its immediate material inputs or manufacturing processes were not explicitly identified or quantifiable without further primary data. However, the framework of the LSR Update is acknowledged, and for future, more granular analyses, relevant land-based impacts (e.g., specific agricultural inputs, deforestation links to raw materials) would be integrated. At this level of analysis, the impact from LSR is assumed to be negligible or embedded within general material emission factors.

5.2. Scope 3 Compliance

This analysis diligently addresses Scope 3 emissions, covering critical upstream and downstream activities including raw materials,

manufacturing (indirect), all relevant transportation stages, product use phase, and end-of-life. With a detailed Bill of Materials, specific energy data, and explicit consideration of logistics, use-phase, and EoL, the report demonstrates a robust effort to achieve at least 95% coverage for Scope 3 reporting, in line with 2026 requirements.

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6. Step 5: Review & Report

6.1. Emission Hotspots

The analysis identifies the following key emission hotspots for **wpptyiktvp**:

- **Materials Acquisition & Processing (54.8%):** The extraction and processing of raw materials, particularly the aluminum casing and lithium-ion battery, constitute the largest single contributor to the product\'s carbon footprint. This highlights the importance of sustainable sourcing and material efficiency.
- **Use Phase Energy Consumption (25.9%):** The energy consumed by the product during its 4-year lifespan significantly contributes to its overall footprint, driven by the electricity mix of the region where it is used (assumed EU average). Improving product energy efficiency is crucial here.
- **Manufacturing (Scope 2, 13.9%):** Purchased electricity for the manufacturing process is a notable hotspot. Increasing the share of renewable energy at the production facility in China offers a direct pathway for reduction.

6.2. Reliability Statement

This report is based on the parameters and data provided by **hiuhojinom**, augmented with illustrative industry-standard emission factors from reputable databases (e.g., general DEFRA/Ecoinvent categories) where primary data was unavailable or specified as placeholders. The methodology adheres strictly to the GHG Protocol Product Standard. While efforts have been made to ensure accuracy, the quantitative results are dependent on the quality and completeness of the input data and the assumptions made for

generic emission factors. The report provides a robust baseline for identifying hotspots and informs strategies for emission reduction.

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7. Conclusion & Recommendations

The Product Carbon Footprint for **wpptyiktvp** is 12.95 kg CO2e per unit. This comprehensive analysis highlights that material choices and the energy consumption during the product\'s use phase are the most significant drivers of its environmental impact.

Recommendations for hiuhojinom:

- **Material Optimization:** Investigate alternative, lower-carbon materials for components like the aluminum casing and battery. Explore lightweighting opportunities and increased recycled content.
- **Manufacturing Energy Transition:** Accelerate the transition to 100% renewable energy for manufacturing operations in China, directly reducing Scope 2 emissions.
- **Product Energy Efficiency:** Focus on design improvements to reduce the energy consumption of **wpptyiktvp** during its use phase, especially targeting regions with higher carbon intensity grids.
- **Enhanced Circularity:** Leverage the established take-back program to maximize material recovery and explore opportunities for component reuse or remanufacturing beyond basic recycling.
- **Supplier Engagement:** Collaborate with suppliers to improve transparency on upstream emissions and encourage their decarbonization efforts.
