Lifecycle Mapping & Greenhouse Gas Assessment

Product Name: Estée Lauder Pure Color Whipped Matte Lip Color

Product Overview and Functional Unit (FU)

Each unit of Estée Lauder Pure Color Whipped Matte Lip Color with Moringa Butter is a 6.5g cosmetic product with a shelf life of 24 months, packaged in virgin petroleum plastic. The dimensions of the packaging are 3.94 x 4.33 x 4.72 inches. This product is sold through retail distribution channels such as department stores, boutiques, and online in 150 countries.

As the second largest cosmetics company in the world, The Estée Lauder Companies Inc. sources ingredients globally, particularly, Indonesia, Malaysia, Australia, Madagascar, and China. Key manufacturing locations include Belgium, Switzerland, Japan, and the United States.

The life cycle includes the sourcing of ingredients and raw materials, transportation, manufacturing, distribution, and disposal. Independent analysis is based on publicly available sources.

Lifecycle Stages

Life Cycle Stage	Details	Sources of GHG Emissions	Emission Intensity	Remarks
1. Raw Materials Sourcing	***Packaging:*** **Primary Packaging:** *Virgin petroleum plastic and Recycled post-consumer plastics,* COTRIA CR and SKYPET CR, ECOZEN CLARO **Secondary Packaging:** Forest Stewardship Council (FSC) Certified Paperboard ***Ingredients for lipstick:*** Isododecane, Isononyl Isononanoate, Dimethicone, Silica, Moringa Oil/Hydrogenated Moringa Oil Esters, Polybutene, Synthetic Beeswax, Hydrogenated Polyisobutene, Microcrystalline Wax/Cera Microcristallina/Cire Microcristalline, Magnesium Myristate, Quaternium-90 Bentonite, Sodium Hyaluronate, Ricinus Communis (Castor) Seed Oil, Hydrogenated Castor Oil, Olea Europaea (Olive) Fruit Extract, Cetyl Peg/Ppg-10/1 Dimethicone, Dimethicone/Vinyl Dimethicone Crosspolymer, Stearalkonium Hectorite, Triticum Vulgare (Wheat) Bran Extract, Polyglyceryl-3 Diisostearate, Isopropyl Myristate, Propylene Carbonate, Isopropyl Titanium Triisostearate, Lauryl Methacrylate/Glycol Dimethacrylate Crosspolymer, Cholesterol, Glyceryl Stearate, Butylene/Ethylene/Styrene Copolymer, Ethylene/Propylene/Styrene Copolymer, Polyethylene, Oleic Acid, Palmitic Acid, Polyhydroxystearic Acid, Tocopherol, Potassium Sulfate, Fragrance (Parfum), Bht. May Contain (+/-): Mica, Titanium Dioxide (Ci 77891), Iron Oxides (Ci 77491), Iron Oxides (Ci 77492), Iron Oxides (Ci 77499), Bismuth Oxychloride (Ci 77163), Red 7 Lake (Ci 15850), Red 33 Lake (Ci 17200), Yellow 6 Lake (Ci 15985), Red 21 (Ci 45380), Red 27 (Ci 45410), Orange 5 (Ci 45370), Blue 1 Lake (Ci 42090), Red 28 Lake (Ci 45410), Carmine (Ci 75470), Red 30 Lake (Ci 73360), Manganese Violet (Ci 77742), Yellow 5 Lake (Ci 19140), Red 22 Lake (Ci 45380), Red 6 (Ci 15850).	Agricultural practices from global suppliers	High	Agriculture is an intensive source of GHG emissions through machinery, fertilizer use, and other practices.

2. Inbound Transportation	**Countries of Origin:** Indonesia, Malaysia, Australia, Madagascar, China, and other select countries from Asia Pacific and Africa **Transportation methods:** Air and sea	Fossil fuel	**Medium**	Key manufacturing locations are far from sourcing locations but less intensive per unit
3. Manufacturing	**Equipment used:** Computerized control systems, automated dispensing systems, large-scale mixing tanks, high-capacity high-shear mixers, sampling equipment, industrial filters, sterilization tunnels, filling lines, automated capping machines **Processes for manufacturing of lipstick:** Batching of raw materials, pre-mixing, coloration, filtration, sterilization **Processes for packaging: Injection molding, filling and capping. Printing, labeling,**	Electricity, Water, Heat pumps	**Low**	Energy-intensive and uses electricity throughout the manufacturing process. However, EL uses 100% renewable energy and has already achieved zero industrial waste-to-landfill for 100% of its global manufacturing, distribution and innovation sites.
4. Packaging	**Process and Equipment:** A conveyor belt system transports the finished lipstick tubes. These machines fold and form the secondary packaging (boxes) around the lipsticks. **Energy used:** Significant electricity consumption	Electricity	**Low**	
5. Outbound Transportation	**Modes of transportation:** Ships, trucks, rails	Fossil fuel	**Medium**	Upstream emissions are less intensive per unit
6. Distribution and Storage	***Distribution towards retail channels:*** **Destinations:** All US states and 150 countries in 6 continents **Storage:** Room temperature **Materials for storage when not displayed in stalls:** Cardboard boxes ***Distribution to the consumer:*** **Materials:** Single-use plastic when customer makes a purchase	Electricity	**Low**	Minimal storage requirements as lipsticks only need to be stored at room temperature.

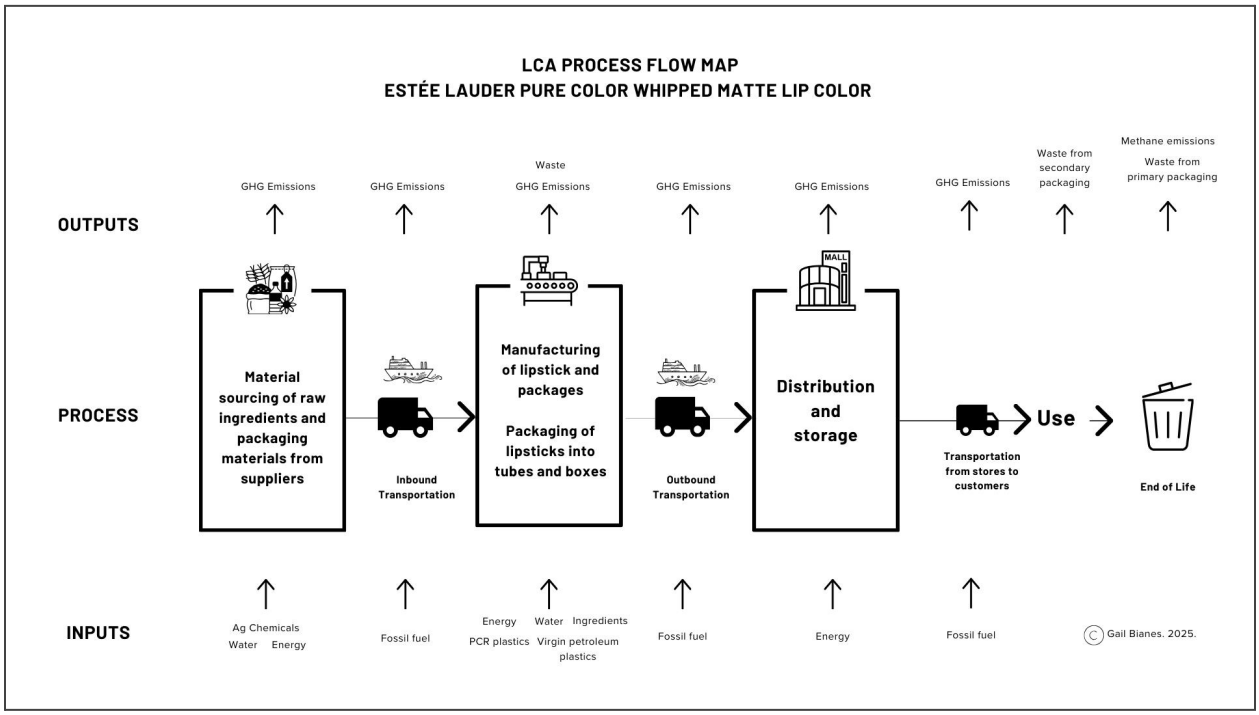
7. Use	**Application:** The product is applied by humans and does not require heavy equipment **Assumed frequency of use:** 1x - 2x a day **Shelf life:** 24 months upon opening **Storage:** Room temperature	N/A	**Low**	The use of lipstick itself has minimal impact on GHG emissions.
8. End of Life	Disposal	Landfill disposal Incineration	**Medium**	Discarding lipstick tubes in general waste leads to landfill disposal, which doesn't allow for material recovery and contributes to methane emissions.

Green: Low Emission Intensity - This stage has minimal greenhouse gas emissions, accounting for **less than 25%** of the total emissions for the product.

Yellow: Moderate Emission Intensity - This stage contributes moderately to greenhouse gas emissions, making up **around 25-45%** of the total emissions for the product.

Red: High Emission Intensity - This stage has a significant impact on greenhouse gas emissions, contributing to **over 45%** of the total emissions for the product.
Provide reasoning for each color coding.

Process Map


LCA PROCESS FLOW MAP
ESTÉE LAUDER PURE COLOR WHIPPED MATTE LIP COLOR
OUTPUTS
PROCESS
INPUTS
GHG Emissions
GHG Emissions
Waste
GHG Emissions
GHG Emissions
GHG Emissions
Waste from secondary packaging
Methane emissions
Waste from primary packaging
Material sourcing of raw ingredients and packaging materials from suppliers
Inbound Transportation
Manufacturing of lipstick and packages
Packaging of lipsticks into tubes and boxes
Outbound Transportation
Distribution and storage
Transportation from stores to customers
Use
End of Life
Ag Chemicals
Water
Energy
Fossil fuel
Energy
Water
Ingredients
PCR plastics
Virgin petroleum plastics
Fossil fuel
Energy
Fossil fuel
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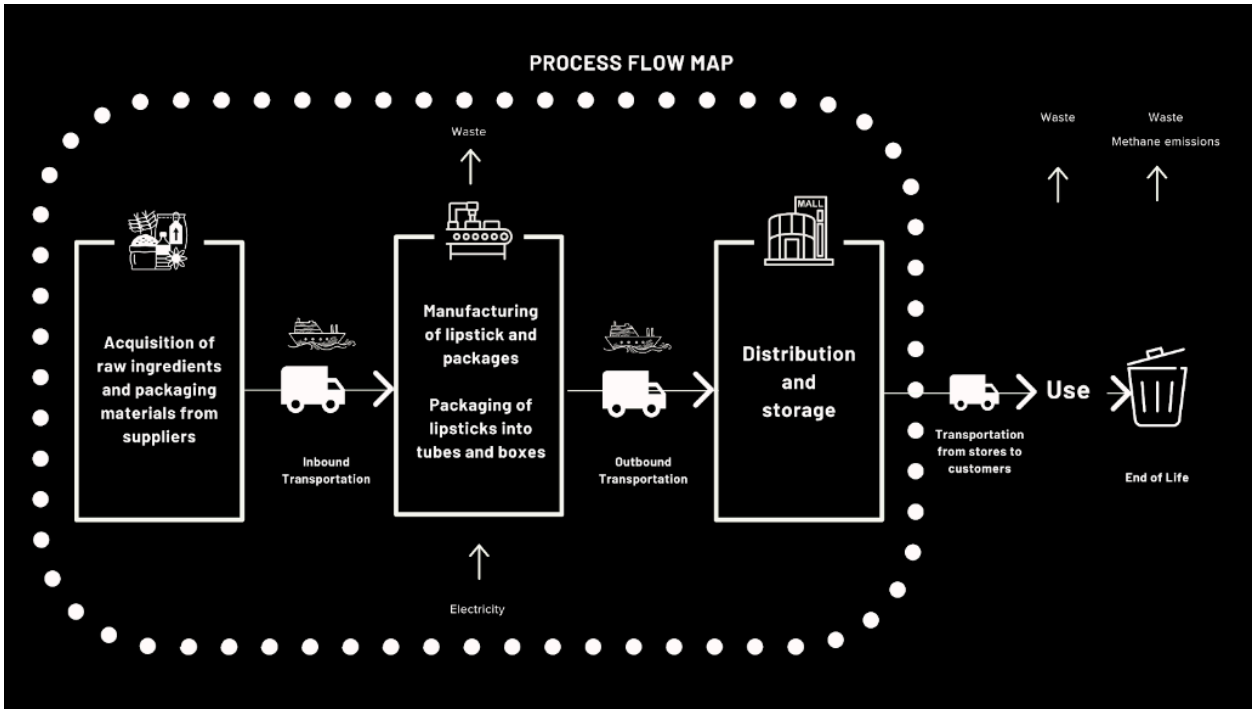
PROCESS FLOW MAP
Waste
Waste
Methane emissions
Acquisition of raw ingredients and packaging materials from suppliers
Inbound Transportation
Manufacturing of lipstick and packages
Packaging of lipsticks into tubes and boxes
Outbound Transportation
Distribution and storage
Transportation from stores to customers
Use
End of Life
Electricity

Assumptions

Since many aspects of manufacturing processes are proprietary, this assessment assumes a similar process for general industrial-scale production of cosmetic products. It is also assumed that consumers own multiple lipsticks from different brands, which reduces the frequency of use for Estee Lauder products and maximizes its shelf life.

Lifecycle Stages and Emissions Analysis

Estée Lauder is a global purchaser of farmed ingredients. The company reports prioritizing suppliers that have sustainability initiatives and avoiding ingredients grown on land that was deforested for crop production, tree plantations, or other land uses. However, raw materials supplied for cosmetic production are typically grown on a commercial scale, which assumes use of heavy machinery, fertilizer use, and other practices that contribute to the carbon intensity of agriculture. Non-renewable materials in packaging also drive GHG emissions due to the extraction of virgin petroleum plastic.

The use of renewable energy in manufacturing has enabled Estee Lauder to maintain a low-intensity manufacturing process. Typical emission hotspots such as transportation also appear less intensive due to the size of the unit, but may potentially be a key emission driver on a global scale due to Estee Lauder's reach and operations.

Based on this analysis, reducing GHG emissions from materials sourcing should be the top priority. This presents an opportunity to drive sustainable agriculture in the supply chain through supplier engagement. Key initiatives can include incentivizing suppliers to disclose climate-related data and improve agricultural practices.

Sources

Lahey, S. (2023, October 17). *Estée Lauder Signs Deal for Recycled Materials for Packaging*. ESG Today. https://www.esgtoday.com/estee-lauder-signs-deal-for-recycled-materials-for-packaging/

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