Package Compare Report

Thursday, 2022-09-15 11:47:05 AM

Goal & Scope

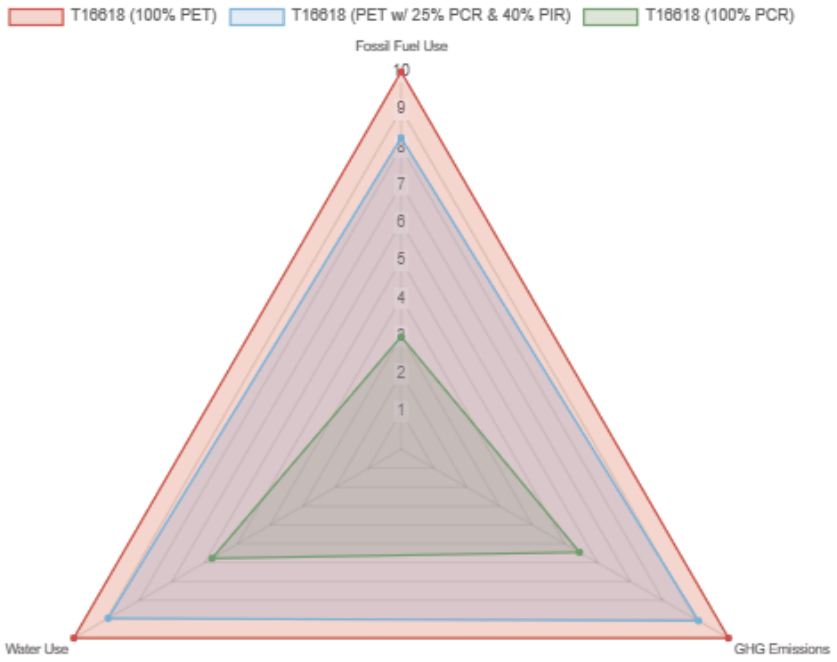
This report shows the environmental impact calculated using a screening Life Cycle Analysis. The analysis below can include the environmental impact for all life cycle phases in a Cradle-to-Grave analysis.

Analysis
Data Version: COMPASS 2022.5
Company: Lacerta Group LLC
Number of BOMs in Analysis: 3
Material Scrap Rates considered: Yes

Functional Unit: 5,400,000 oz
The environmental impact calculated in this analysis is for the packaging required to deliver the amount of product described by the functional unit. This includes the number of primary, secondary and tertiary packages shown below. These package numbers were calculated based on the pallet configuration modeled in the BOM. If the secondary and tertiary package data is not entered their environmental impact cannot be calculated.The analysis below can include the environmental impact for all life cycle phases in a Cradle-to-Grave analysis.

Package Name	# of Primary Packages	# of Secondary Packages	# of Tertiary Packages
T16618 (100% PET)	112,500	750	30
T16618 (PET w/ 25% PCR & 40% PIR)	112,500	750	30
T16618 (100% PCR)	112,500	750	30

Note: This COMPASS report uses life cycle inventory (LCI) data that represents an industry average for materials, manufacturing processes, and end of life impacts. The Life Cycle Analysis (LCA) in this report can be used for directional guidance in internal decision making and understanding trade-offs. COMPASS follows the guidelines of ISO 14040 in determining and documenting the scope, assumptions, consistent boundary conditions and data sources. According to ISO 14040, LCA results should not be used to make comparative assertions between competitive products to be disclosed to the public without first conducting a third party critical review.



Total Environmental Impact

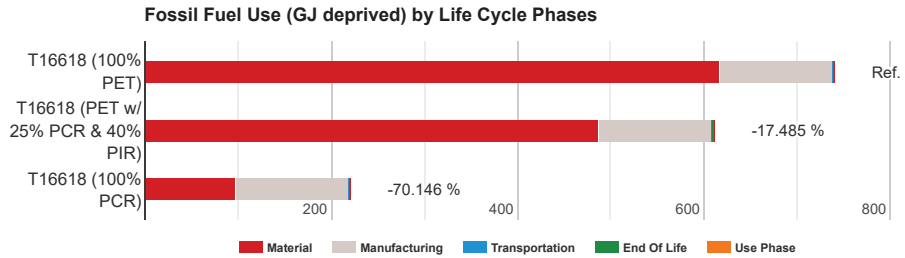
This section shows the total impact for each of the selected indicators used for the Life Cycle Analysis. Each indicator is composed of the material extraction, manufacturing, transportation, end of life, and use phase impacts. This will allow you to determine which life cycle phase has the greatest impact.

Note: The material phase measures the environmental footprint of extracting and processing materials. The manufacturing phase calculates the impact of the manufacturing or conversion processes that companies use to add value and create the package or product. Use phase includes the environmental impact during the useful life of the package/product. Typically, the use phase impact is due to the consumption of resources like electricity, fuel, or other consumables. For the transportation phase, the impact is calculated based on the mode of transportation (road, rail, air, sea) as well as the distances travelled. The end of life impact calculation incorporates the most likely fate of the product/package and its components based on typical curbside municipal waste management. Typical percentage rates for region based recycling, incineration, and landfill are used to calculate the impacts.

Fossil Fuel Use (GJ deprived)

Total quantity of fossil fuel consumed throughout the life cycle reported in gigajoules (GJ) equivalents deprived. This indicator uses the Impact World+ method and assumes fossil resources mainly used for energy purposes. Fossil fuels include coal, petroleum, and natural gas. Inputs for nuclear fuel such as uranium are accounted for in the MINERAL CONSUMPTION indicator.

T16618 (100% PET)	Material 616.897 (83.358%)	Manufacturing 121.424 (16.407%)	Transportation 0 (0%)	EndOfLife 1.738 (0.2349%)	UsePhase 0 (0%)	Total 740.06
T16618 (PET w/ 25% PCR & 40% PIR)	Material 487.116 (79.769%)	Manufacturing 121.424 (19.884%)	Transportation 0 (0%)	EndOfLife 2.121 (0.3473%)	UsePhase 0 (0%)	Total 610.661
T16618 (100% PCR)	Material 97.772 (44.254%)	Manufacturing 121.424 (54.959%)	Transportation 0 (0%)	EndOfLife 1.738 (0.7868%)	UsePhase 0 (0%)	Total 220.935



SIMPLE Indicators

Fossil Fuel Use Differences for Each BOM Compared to the Reference

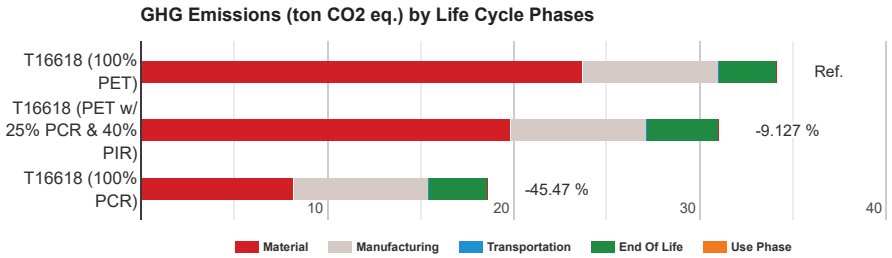
T16618 (PET w/ 25% PCR & 40% PIR)
129.399 GJ deprived
21.151 Barrels of Oil
3.457 Average Homes Powered Yearly

T16618 (100% PCR)
519.125 GJ deprived
84.854 Barrels of Oil
13.867 Average Homes Powered Yearly

GHG Emissions (ton CO_2 eq.)

The total quantity of greenhouse gases (GHG) emitted throughout the life cycle reported in tons of CO2 equivalents. This calculation follows the IPCC Sixth Assessment Report (AR6) 2021 100a w/o CO2 Uptake method and considers climate feedback loops.

T16618 (100% PET)	Material 23.693 (69.419%)	Manufacturing 7.275 (21.317%)	Transportation 0 (0%)	EndOfLife 3.162 (9.265%)	UsePhase 0 (0%)	Total 34.13
T16618 (PET w/ 25% PCR & 40% PIR)	Material 19.813 (63.881%)	Manufacturing 7.275 (23.457%)	Transportation 0 (0%)	EndOfLife 3.927 (12.661%)	UsePhase 0 (0%)	Total 31.015
T16618 (100% PCR)	Material 8.174 (43.919%)	Manufacturing 7.275 (39.091%)	Transportation 0 (0%)	EndOfLife 3.162 (16.99%)	UsePhase 0 (0%)	Total 18.611



SIMPLE Indicators

GHG Emissions Differences for Each BOM Compared to the Reference

T16618 (PET w/ 25% PCR & 40% PIR)
3.115 ton CO_2 eq.

- **0.667** Passenger Vehicles Driven Yearly
- **7,634.136** Miles Driven by Passenger Vehicles Yearly
- **1,326.716** Liters of Gasoline Consumed
- **80.713** Tree Seedlings Grown for 10 Years
- **3.664** Acres of Forests Yearly

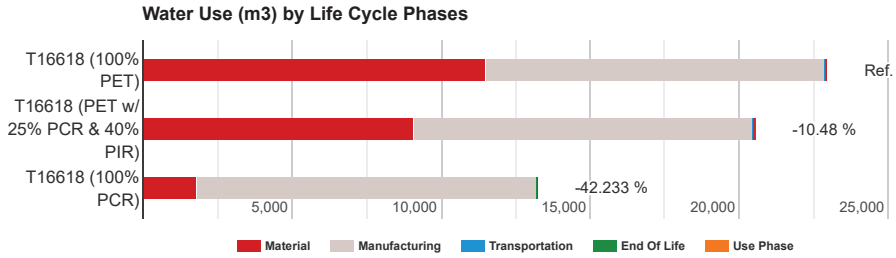
T16618 (100% PCR)
15.519 ton CO_2 eq.

- **3.323** Passenger Vehicles Driven Yearly
- **38,036.647** Miles Driven by Passenger Vehicles Yearly
- **6,610.284** Liters of Gasoline Consumed
- **402.15** Tree Seedlings Grown for 10 Years
- **18.258** Acres of Forests Yearly

Water Use (m^3)

The relative available water remaining per area in a watershed after the demand of humans, aquatic ecosystems, and manufacturing process has been met. This indicator uses the AWARE method and accounts for water scarcity. The result represents the relative value in comparison with the average cubic meters consumed in the world. Essentially, the total water consumed to make the package is multiplied by the region's scarcity factor which will either increase or decrease the water usage value based on the scarcity or excess availability of water in a specific region.

T16618 (100% PET)	Material 11,489.171 (50.082%)	Manufacturing 11,370.976 (49.567%)	Transportation 0 (0%)	EndOfLife 80.586 (0.3513%)	UsePhase 0 (0%)	Total 22,940.733
T16618 (PET w/ 25% PCR & 40% PIR)	Material 9,067.003 (44.15%)	Manufacturing 11,370.976 (55.369%)	Transportation 0 (0%)	EndOfLife 98.659 (0.4804%)	UsePhase 0 (0%)	Total 20,536.638
T16618 (100% PCR)	Material 1,800.5 (13.587%)	Manufacturing 11,370.976 (85.805%)	Transportation 0 (0%)	EndOfLife 80.586 (0.6081%)	UsePhase 0 (0%)	Total 13,252.062



SIMPLE Indicators

Water Use Differences for Each BOM Compared to the Reference

T16618 (PET w/ 25% PCR & 40% PIR)
2,404.095 m^3

- **635,163.72** Gallons of Water
- **36,929.258** Average Showers
- **101.176** People Showering Daily for a Year
- **0.9616** Olympic Sized Swimming Pools

T16618 (100% PCR)
9,688.671 m^3

- **2,559,754.453** Gallons of Water
- **148,827.505** Average Showers
- **407.747** People Showering Daily for a Year
- **3.875** Olympic Sized Swimming Pools

Appendix of Sustainable Packaging Attributes that can be used in SCORE

Bio-Renewable Content	Refers to the percentage of bio-based content contained in the Material. This percentage can vary from 0% to 100%. Not all materials will have bio-based content. Primarily paper and plastics will have this content.
Certified Content	Refers to Material sources that have been certified by third party certification programs deemed relevant by the COMPASS user. The definition of 'Certified' varies by user. A wide range of certification programs exist, and COMPASS does not provide guidance on which of these programs may be relevant to users' decision-making. Prior to data input, users are encouraged to create a list of which certification programs they support, and then use this list as the basis for data entry. For example, forest product certification programs that may be of interest to users include the Forest Stewardship Council (FSC), Pan European Forest Council (PEFC) or Sustainable Forestry Initiative (SFI). The percent certified range is between 0% to 100%. Note: %CERTIFIED is a user specified attribute and does not impact the life cycle impact assessment of a package or packaging system.
Chain of Custody Known	The linked set of organizations, from point of harvest or extraction to point of purchase, that have held legal ownership or physical control of raw materials or recycled materials, used in packaging constituents, packaging components, or packaging systems. EcoImpact asks how much of the Chain of Custody is known for the component. A complete chain of custody is measured by a value of 100%. This means that each party in the supply chain is under contractual obligation and is able to disclose proof of their material source(s) through purchasing agreements, inventory records, etc.
Damage Rate	Damage rate measures the frequency a component is damaged during transportation, with the goal of transporting the product to its destination. Damage rate is entered on each component and is rolled up at each package and at the packaging system level.
EPR Fees	EPR Fees are calculated for manufacturers based on a cost per kg of material produced. EcoImpact calculates the total cost for Packages and Packaging Systems based on entered in cost per kg of material.
Fossil Fuel Use	Total quantity of fossil fuel consumed throughout the life cycle reported in gigajoules (GJ) equivalents deprived. This indicator uses the Impact World+ method and assumes fossil resources mainly used for energy purposes. Fossil fuels include coal, petroleum, and natural gas. Inputs for nuclear fuel such as uranium are accounted for in the MINERAL CONSUMPTION indicator.
GHG Emissions	The total quantity of greenhouse gases (GHG) emitted throughout the life cycle reported in tons of CO2 equivalents. This calculation follows the IPCC Sixth Assessment Report (AR6) 2021 100a w/o CO2 Uptake method and considers climate feedback loops.
Material Scrap Rate	Percentage of material scrap of a manufacturing process. Default percentages are pulled from industry average processes. This value can be edited to reflect improved efficiency or yield of manufacturing process. Changing this value affects the LCA of material, manufacturing, and inbound transportation impact. Only available for components with one manufacturing process per material.
Packaged Product Shelf Life	The ratio of a productâ€™s shelf life in packaging to a productâ€™s shelf life without packaging. Measure the length of time a product in packaging is suitable for sale compared to a product not in packaging. Compare only same product types in same packaging types. This metric does not apply to products which do not have a clearly defined shelf life. Do not take and compare measures of different types of products in the same types of packaging or of same types of products in different types of packaging.
Packaging Recovery Rate	The mass fraction or absolute mass of packaging recovered from all sources (commercial and residential) based on relevant waste management statistics. Determine if packaging conforms to the criteria for recoverability as per the relevant standards above. Include disclosure of material aspects of the package that would preclude recovery, e.g. color, material combinations, or coatings. If criteria are fulfilled, express total recovery rate as % of total packaging weight put on the market that is effectively recovered and provide the breakdown per practiced recovery option. Material Recycling: measure each type of packaging produced and/or used for which national waste management recycling rates exist. Note that depending upon the packaging (type, shape, size, color) true recycling rates might not coincide with national recycling rates for specific material or packaging category. Composting: measure each type of packaging produced and/or used for which national waste management industrial composting rates exist. Note that in many regions the rate of composted organic waste may not coincide with the rate of composted packaging waste due to lack of acceptance. Energy Recovery: If packaging is deemed to have energy recovery value and appropriate infrastructure exists, use national waste management statistics. If data is available, measure by material type. Packaging going to final disposal and nonrecovered littering is implicitly calculated from the recovery rate and does not need to be measured separately.
Packaging Reuse Rate	The number of times packaging accomplishes the same use, rotation, or trip for which it was conceived and designed within its life cycle. Determine if packaging conforms to definition of reusability per EN 13429 and ISO/CD 18603. If packaging is deemed reusable per referenced standards and guidelines, include all reused packaging components or packaging units. This metric can be used for primary, secondary, and tertiary packaging. In cases where several packaging levels are being reused, their individual rates should be reported separately and not be cumulated.
Packaging To Product Weight	Packaging to Product Weight Ratio: The ratio of the weight of all packaging material used compared to the weight of the product or functional unit delivered. This is automatically calculated in EcoImpact.

Post Consumer Recycled Content (PCR)	This is the percentage of post-consumer recycled content contained in the Material as defined by ISO 14021. % PCR for materials usually range between 0% to 100%. PCR is not available for all materials.
Post Industrial Recycled Content (PIR)	Post Industrial waste in the form of scrap, rejects etc that is collected from industries and used as recycled content in a new product/package.
Primary Package Cube Efficiency	Ratio of Product volume and Primary package volume. This shows how much empty or head space is there in the primary package. A higher % denotes more efficient use of the Primary package volume and reduced empty space.
Primary Package MCI (0-1)	This is the material circularity index calculated for the primary package.
Primary Package Recyclable SCORE (0-5)	0 - Contaminant = Contaminates the recycling stream 1 - Not Accepted 2 - Very limited acceptance, but growing trend towards acceptance 3 - Limited Acceptance 4 - In process of being widely accepted 5 - Widely Accepted
Secondary Package Cube Efficiency	Ratio of total Product Volume in secondary package and Secondary package volume. This shows how much of the secondary package volume is occupied by the product. A higher % denotes more efficient use of Secondary package and reduced empty space.
Secondary Package Recyclable SCORE (0-5)	0 - Contaminant = Contaminates the recycling stream 1 - Not Accepted 2 - Very limited acceptance, but growing trend towards acceptance 3 - Limited Acceptance 4 - In process of being widely accepted 5 - Widely Accepted
Single Use Plastic	Single Use Plastic
Tertiary Package Cube Efficiency	Ratio of total Product Volume on Pallet and Pallet Volume. This shows how much of the tertiary package volume is occupied by the product. A higher % denotes more efficient palletization and reduced empty space.
Total Cost of Packaging	The total cost of all materials, energy, equipment and direct labor used during the sourcing of raw, recycled and reused materials and the production, filling, transport and/or disposal of packaging materials, packaging components or units of packaging.
Water Use	The relative available water remaining per area in a watershed after the demand of humans, aquatic ecosystems, and manufacturing process has been met. This indicator uses the AWARE method and accounts for water scarcity. The result represents the relative value in comparison with the average cubic meters consumed in the world. Essentially, the total water consumed to make the package is multiplied by the region's scarcity factor which will either increase or decrease the water usage value based on the scarcity or excess availability of water in a specific region.
Weight Reduction	Packaging weight reduction can be calculated as the difference between the immediate, previous, and present packaging design. For environmental relevance, packaging weight reduction should be communicated by material category. Sometimes when packages are light-weighted, this can require other parts of the packaging system (e.g. secondary packaging) to increase in weight to protect a thinner, more fragile part of the package. These weight increases and reductions should be clearly communicated, considered, and quantified.