

Whirl-Pak[®] Sustainable Packaging

EcoImpact-COMPASS Comparison

May 2019

Todd Bukowski



Agenda

- Project Overview
- About EcoImpact-COMPASS
- Executive Summary
- 120 ml water samples variables assessed
- 500 ml water samples variables assessed

Project Overview

Project Overview

- Nasco Sampling approached PTIS to compare the environmental impacts of their Whirl-Pak® 120 ml and 500 ml bags vs. rigid bottle competitors
- For the project PTIS utilized the EcoImpact-COMMPASS software, which is widely used in the packaging industry for quick life cycle assessments (LCA)
- The output will be a comparison of key environmental indicators (fossil fuel used, greenhouse gas emissions, and water use)



About EcoImpact-COMPASS

About EcoImpact-COMPASS



- The EcoImpact-COMPASS tool was originally developed by the Sustainable Packaging Coalition (SPC), and has since been maintained and updated by Trayak
- EcoImpact-COMPASS allows you to build a product or package design model, choose different manufacturing options and view environmental impacts to help you make better sustainable design decisions
- EcoImpact-COMPASS uses Life Cycle Assessment (LCA) to calculate environmental impacts. Understanding these LCA indicators gives you an idea of the environmental footprint of your products and packages. You can then benchmark your current design and compare new design options
- EcoImpact-COMPASS was developed as a guidance tool that can inform material selection for packaging and/or product design

EcoImpact-COMPASS limitations

- The EcoImpact-COMPASS tool allows for a quick Lifecycle Assessment (LCA) and for the opportunity to compare different package variables
- It is not meant for claims (as it uses industry average data), but can be used to help make more informed decisions on which package (based on materials used, weight, process, PCR content, transportation, etc.) may have lower environmental impacts
- An LCA focuses on the efficient use of resources in a Sustainable Materials Management (SMM) model, but does not focus as much on a Circular Economy (CE) model – meaning even though a material may have a lower overall environmental impact, it may still not be recycled. This is a consideration that companies should be aware of in their decision process
- The EcoImpact-COMPASS tool does not include all materials, processes, and variables, and as it uses industry average data, does not account for proprietary processes that can have a lower or greater overall impact than industry averages

Executive Summary

Executive Summary

- The competitors rigid bottles use anywhere from 5-10 times as much material (by weight) as the equivalent size Whirl-Pak® pouch. Generally, lighter materials will have corresponding lower environmental impacts when compared (using similar material – such as different types of plastic resins)
- The results show that the Whirl-Pak® pouch has much lower fossil fuel use, greenhouse gas impacts, and water usage – often by a very wide margin (ex. GHG for rigid bottles evaluated were anywhere from 600% – 1400% greater than the flexible pouch)
- The Whirl-Pak® pouch is more efficient in the environmental metrics evaluated across material usage, manufacturing, transportation, and end of life
 - For example, the ability of the flexible pouch to be more space efficient in a shipping case, results in much lower transportation impacts

Note: The EcoImpact tool does not include proprietary processes for sterilization on both the pouch and bottle – which would likely result in even higher overall impacts disparity between Whirl-Pak® and competitors

LCA Charts & Insights

120 ml samples

120 ml Variables Assessed

- The following 120 ml variables were assessed for their environmental impact, across the attributes of fossil fuel used, greenhouse gas emissions, and water use:
 - Whirl-Pak® pouch
 - PP bottle (with integrated closure)
 - PET bottle
 - HDPE bottle
- For the comparison, the primary package, protective poly bag, and corrugated case were included in the comparison

For sake of comparison, the Whirl-Pak® pouch was used as the standard and other variables were compared to this sample



Whirl-Pak® bag



PP Bottle



PET Bottle



HDPE Bottle

120 ml Variables Assessed

120 ml Variables Assessed

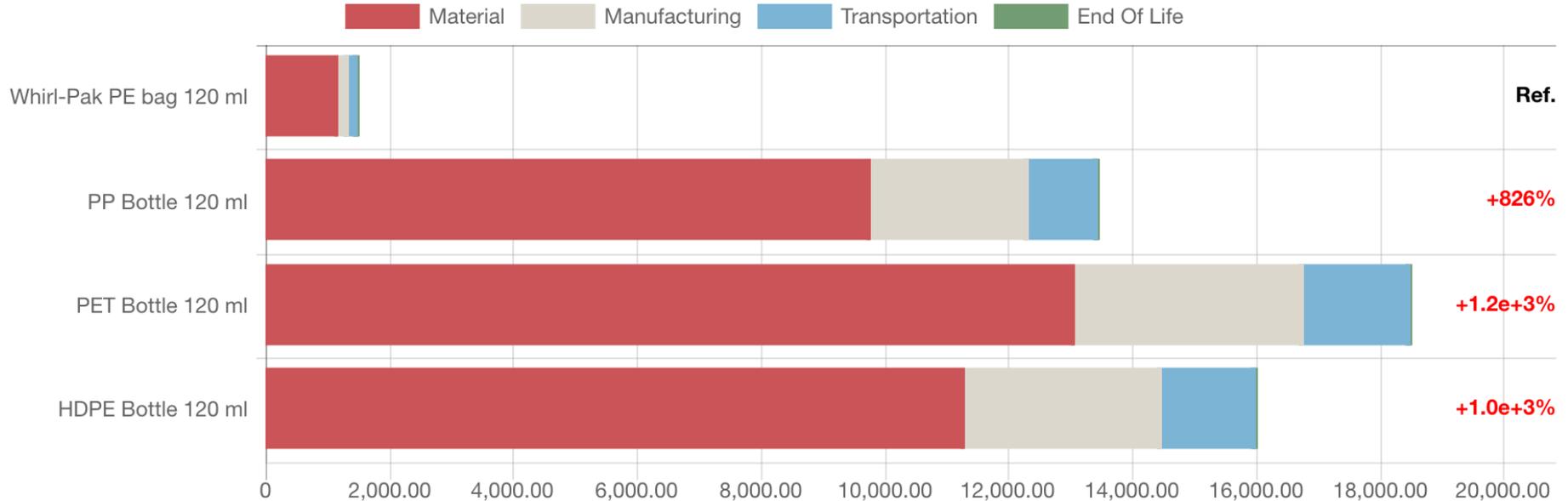
Name	Material	Weight (g)	Process	Shipping (km)
Whirl-Pak®	LLDPE	2.24	Film Extrusion	1000
PP bottle	PP	20.76	Blow Molding	1000
PET bottle	PET	27.05	Blow Molding	1000
HDPE bottle	HDPE	22.33	Blow Molding	1000

Weights include closure on bottle options and label + metal tie for Whirl-Pak®

Also included weight of poly bag and corrugated container. A shipping distance of 1000 km was included in the assessment

120 ml Sample Comparison – Fossil Fuel Use

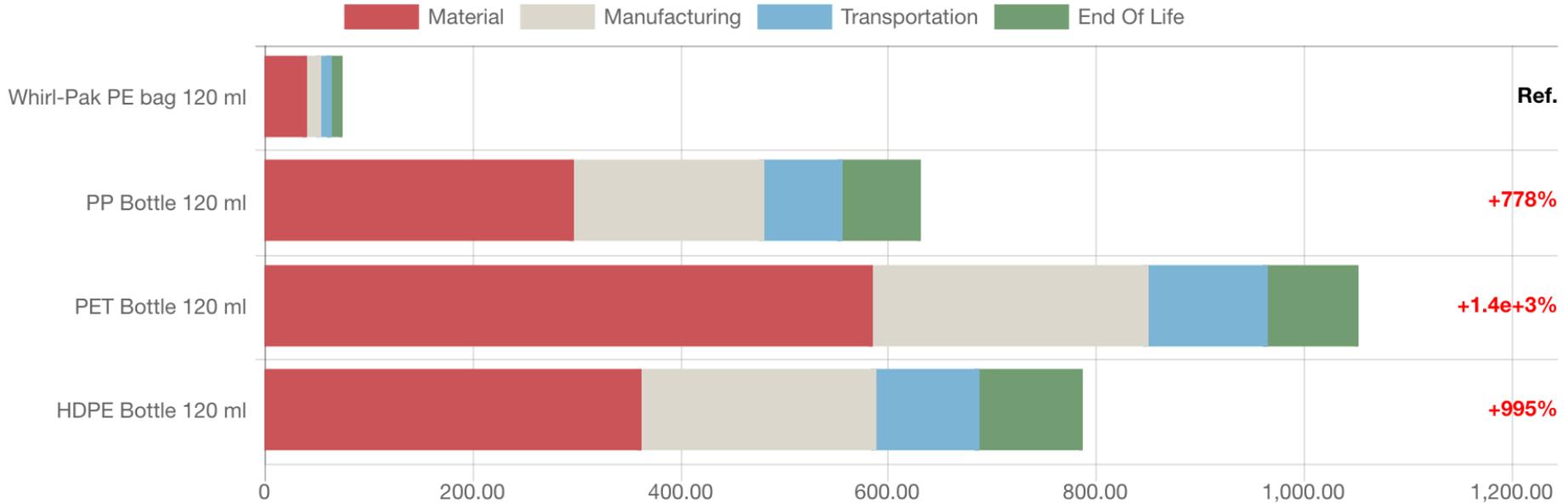
Fossil Fuel Use (MJ deprived)



Whirl-Pak® bags uses significantly less fossil fuel than other options – as others are about 10x higher in weight. Film extrusion process also is much more efficient overall than blow molding

120 ml Sample Comparison– GHG Emissions

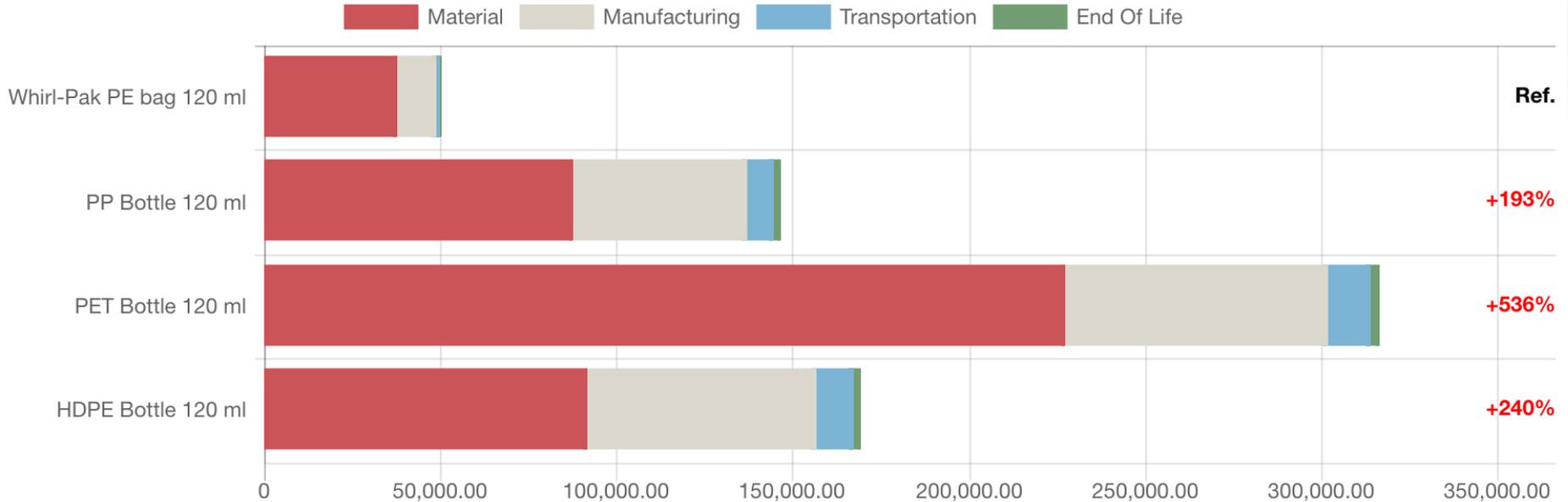
GHG Emissions (kg CO2 eq.)



Similar to fossil fuel use, Whirl-Pak® generates significantly lower than GHG than rigid options since it again uses far less material overall. Note the Whirl-Pak® option is much lower across material – manufacturing – transportation and end of life impact

120 ml Sample Comparison – Water Use

Water Use (liters)



Whirl-Pak® uses much less water than other processes – driven largely by the manufacturing/conversion process where water is often needed to cool molds

120 ml Variables Assessed – Comparison Summary

Variable	Weight (g)	Fossil Fuel	GHG	Water
Whirl-Pak®	2.24	-----	-----	-----
PP bottle	20.76	+826%	+778%	+193%
PET bottle	27.05	+1200%	+1400%	+536%
HDPE bottle	22.33	+1000%	+995%	+240%

Lower weight and reduced use of materials often results in lower environmental impacts. The results show that the Whirl-Pak® pouch, with about 10% of the weight of the other variables. – has much lower impacts across fossil fuel use, GHG emissions, and water use

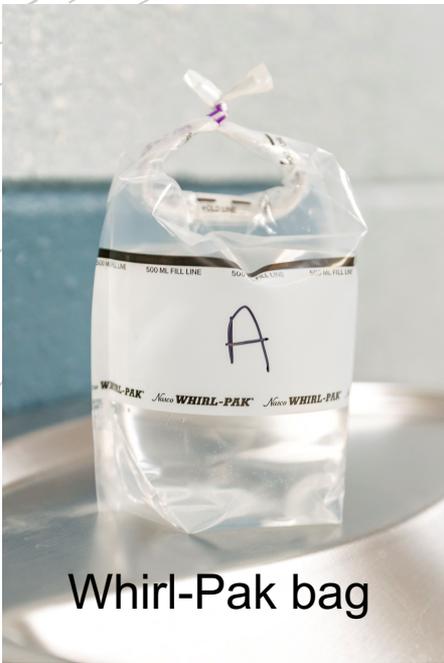
LCA Charts & Insights

500 ml samples

500 ml Variables Assessed

- The following 500 ml variables were assessed for their environmental impact, across the environmental attributes of fossil fuel used, greenhouse gas emissions, and water use:
 - Whirl-Pak® pouch
 - PP bottle (with integrated closure)
 - PET bottle
 - HDPE bottle
- For the comparison, the primary package, protective poly bag, and corrugated case were included in the comparison

For sake of comparison, the Whirl-Pak ® pouch was used as the standard and other variables were compared to this sample



Whirl-Pak bag



PP Bottle



PET Bottle



HDPE Bottle

500 ml Variables Assessed

500 ml Variables Assessed

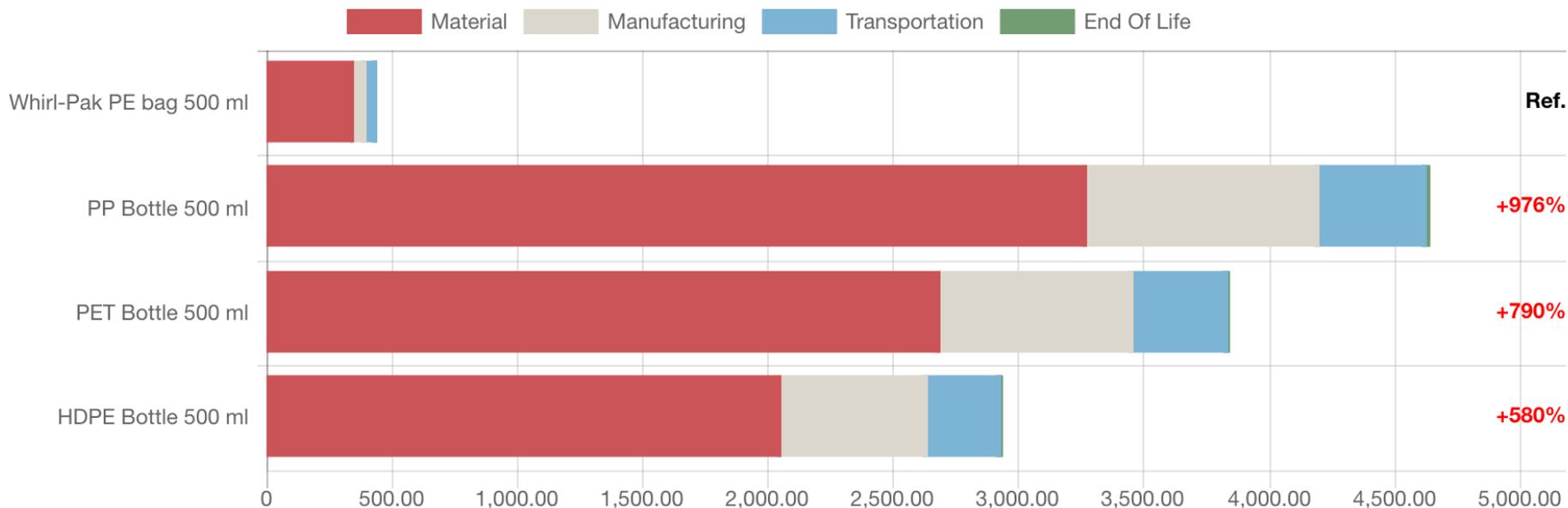
Name	Material	Weight (g)	Process	Shipping (km)
Whirl-Pak®	LLDPE	6.9	Film Extrusion	1000
PP bottle	PP	68.18	Blow Molding	1000
PET bottle	PET	54.21	Blow Molding	1000
HDPE bottle	HDPE	38.16	Blow Molding	1000

Weights include closure on bottle options and label + metal tie for Whirl-Pak®

Also included weight of poly bag (LDPE was used) and corrugated container. A shipping distance of 1000 km was included in the assessment

500 ml Sample Comparison – Fossil Fuel Use

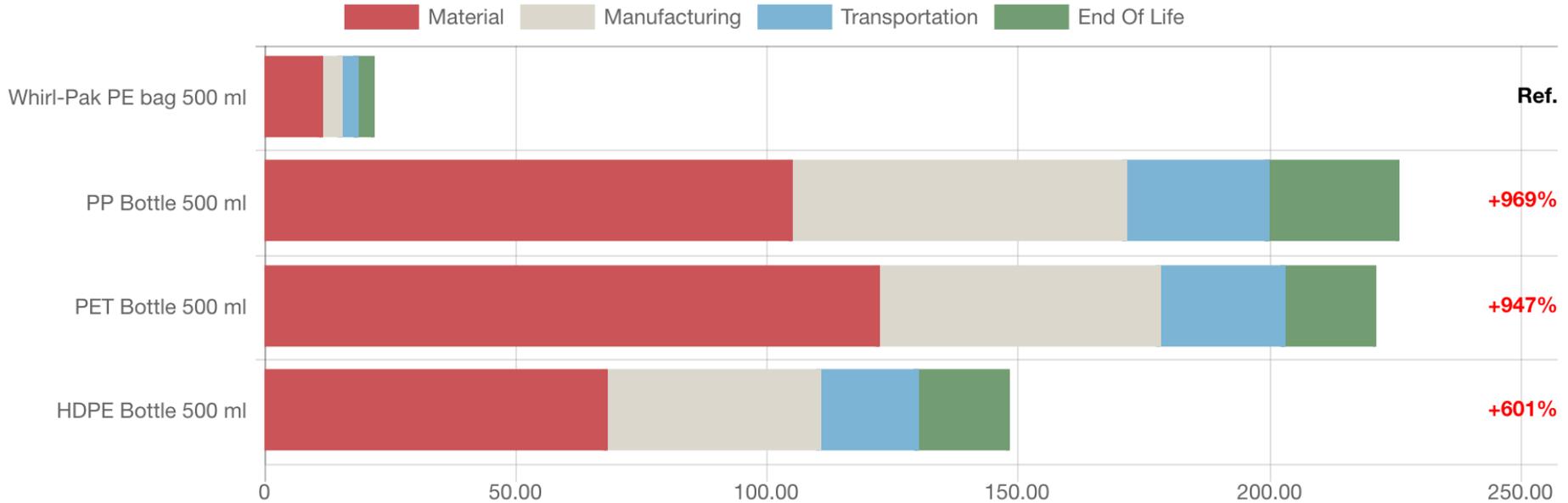
Fossil Fuel Use (MJ deprived)



Rigid bottles are about 5-10x heavier than Whirl-Pak® pouch – and have correspondingly much higher fossil fuel use, as would be expected by using more material

500 ml Sample Comparison– GHG Emissions

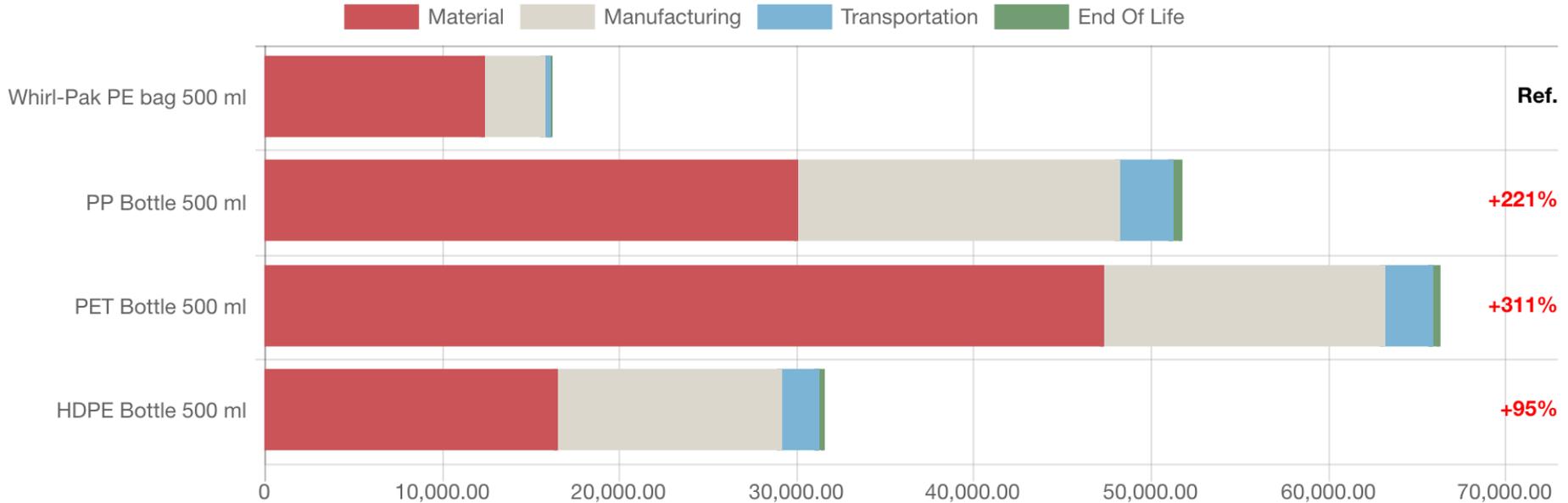
GHG Emissions (kg CO2 eq.)



Again, the Whirl-Pak® pouch is much lighter and has much lower GHG emissions across all phases when compared to rigid bottles

500 ml Sample Comparison – Water Use

Water Use (liters)



Overall, the Whirl-Pak® flexible pouch, has much lower overall water usage than other options, particularly in the manufacturing/conversion process

500 ml Variables Assessed – Comparison Summary

Variable	Weight (g)	Fossil Fuel	GHG	Water
Whirl-Pak®	6.9	-----	-----	-----
PP bottle	68.18	+976%	+969%	+221%
PET bottle	54.21	+790%	+947%	+311%
HDPE bottle	38.16	+580%	+601%	+95%

Lower weight and reduced use of materials often results in lower environmental impacts. The results show that the Whirl-Pak® pouch, with about 10% of the weight of the other variables. – has much lower impacts across fossil fuel use, GHG emissions, and water use

Thank You

PTIS

Todd Bukowski

todd@ptisglobal.com

(m): +1.734.972.4175

Phil McKiernan

phil@ptisglobal.com

(m): +1.920.851.1964

Mike Richmond

mike@ptisglobal.com

(m): +1.269.806.4568

