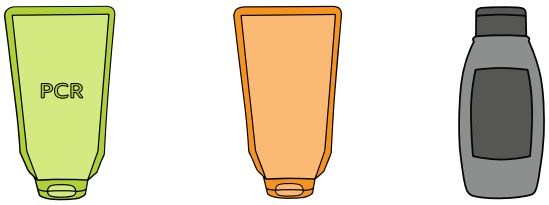
STREAMLINED LIFE CYCLE ASSESSMENT* SHAMPOO PACKAGING CASE STUDY

SHAMPOO PACKAGE COMPARISON

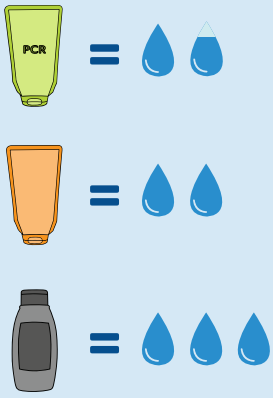
Many types of shampoo available today are packaged in HDPE plastic bottles. For this Life Cycle Assessment study with a cradle-to-grave boundary, a comparison was made between a popular shampoo brand in an HDPE bottle versus the premade STANDCAP Pouch, an eco-friendly inverted flexible pouch.



PCR STANDCAP | STANDCAP | HDPE BOTTLE

Water Consumption

When looking at water use during the life cycle of the two package formats, the premade STANDCAP Pouch results in about one-third (-34.6%) less water usage. The addition of PCR further reduces water usage (-43.3%). This is largely driven by the water that is needed in the blow molding manufacturing process for the rigid bottle.



Greenhouse Gas Emissions

The premade PCR STANDCAP Pouch has a GHG emissions impact of only half (-53.5%) that of the HDPE bottle. This is because of the amount of material used and the greater end-of-life impact for the plastic bottle.

Fossil Fuel Consumption

The premade STANDCAP Pouch uses less fossil fuel (-54.3%) than an HDPE bottle to manufacture (and an additional reduction (-59.0%) through the use of PCR). This is hardly a surprise, as the bottle uses more than twice the material to make.

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*All environmental impact metrics were developed using the streamlined life cycle assessment tool, EcoImpact-COMPASS®

END OF USE SUMMARY

SOURCE REDUCTION BENEFITS

According to the U.S. EPA Waste Hierarchy, the most preferred method for waste management is source reduction and reuse.

A major benefit of flexible packaging is the high product-to-package ratio that it offers.

RECOVERY BENEFITS

PCR STANDCAP

1x
amount of material ending up as municipal solid waste

STANDCAP

1x
amount of material ending up as municipal solid waste

HDPE BOTTLE

1.7x
amount of material ending up as municipal solid waste

High product-to-package ratio:

95.6% Product weight | **4.4%** Package weight

95.6% Product weight | **4.4%** Package weight

Low product-to-package ratio:ratio:

91.0% Product weight | **9.0%** Package weight

While many multi-material flexible packages are not yet recovered and recycled in any significant amount, they still result in a substantial reduction in the amount of material sent to landfill versus other types of packaging.

The HDPE bottle requires more than **twice** the amount of material of packaging to contain 1000kg of shampoo. Even when considering that the HDPE bottle is recycled at a rate of **29.3%** in the U.S. today, it still results in considerably more material being discarded at end of life

IMPLICATIONS

The premade STANDCAP Pouch has a number of sustainability benefits when compared to a HDPE bottle for packing and shipping shampoo. These include lower fossil fuel and water use, GHG emissions, better product-to-package ratio and considerably less material discarded at end-of-life.

FORMAT	FOSSIL FUEL CONSUMPTION (MJ-EQUIV)	GHG EMISSIONS (KG-CO^2 EQUIV)	WATER CONSUMPTION (L)	PRODUCT-TO-PACKAGE RATIO (%)	PKG LANDFILLED (G)/1,000 KG SHAMPOO)
PCR STANDCAP POUCH 	1.63 (-59.0%)	.07975 (-53.5%)	22.52 (-43.3%)	21.7:1 (95.6% : 4.4%)	46,118 (-40.3%)
STANDARD STANDCAP POUCH 	1.81 (-54.3%)	.08441 (-50.8%)	25.97 (-34.7%)	21.7:1 (95.6% : 4.4%)	46,118 (-40.3%)
HDPE BOTTLE 	3.97	.1715	39.75	10.1:1 (91.0% : 9.0%)	77,241

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*For more information and methodologies of assessments, please visit **www.flexpack.org** or **www.glenroy.com** to download Glenroy's "A Streamlined Life Cycle Assessment Comparison for the Glenroy Premade STANDCAP Pouch in the Sauces and Personal Care Market versus Rigid Packaging Options" report and refer to pages 40-44.*