

FLEXIBLE PACKAGING OFFERS SIGNIFICANT SUSTAINABILITY BENEFITS FOR E-COMMERCE APPLICATIONS

E-commerce is a growing economic segment, experiencing a 14.9% growth rate in 2019 in the U.S. It is expected to maintain annual growth rates of approximately 13% through 2023.

The **Flexible Packaging Association (FPA)** conducted several real-world e-commerce application case studies showing that flexible packaging, when compared to other package formats, has significantly better environmental attributes for greenhouse gas emissions, fossil fuel usage, and water usage.

The five Streamlined Life Cycle Assessment (LCA) case studies use Ecolmpact-COMPASS® LCA software to quantify the environmental and economic shipping impacts of flexible and non-flexible e-commerce packaging. The case studies are highlighted in FPA's "Sustainability Life Cycle and Economic Impacts of Flexible Packaging in E-commerce" report.

FOSSIL FUEL USAGE

The table below shows fossil fuel usage for various packaging options in each case that flexible packaging uses less fossil fuel. As an example, even when the overbox is eliminated, the cereal bag-in-box option still uses more than twice the amount of fossil fuel than the stand up-pouch.

FOSSIL FUELS (MJ-EQUIV)



CEREAL

Stand-up Pouch:	1.22
Bag-in-Box:	2.70
Bag-in-Box with Overbox:	3.94



LAUNDRY DETERGENT

Liquid in a Stand-up Pouch with Fitment:	4.07
Liquid in a HDPE Detergent Bottle:	7.80
Laundry Pods in a Flexible Pouch:	6.93
Laundry Pods in a Flexible Pouch without Overbox:	2.55



PEANUT BUTTER

Stand-up Pouch:	1.29
Stand-up Pouch with Overbox:	1.76
PET Jar:	1.46



SHOES

Shoe Box with Flexible Pouch:	6.26
Shoe Box with Outer Overbox:	7.15



MAILER PACKAGING

Poly Mailer:	1.49
Bubble Mailer:	2.60
Paper Cushion:	2.34
Paperboard:	3.51

GREENHOUSE GAS EMISSION

Both bag-in-box cereal packaging options result in considerably higher overall GHG emissions than the stand-up pouch scenario. Even the bag-in-box option without the overbox results in **+290%** more GHG emissions, which is driven largely by the amount of packaging.

GREENHOUSE GAS EMISSIONS (KG-CO2 EQUIV)



CEREAL

Stand-up Pouch:	.07557
Bag-in-Box:	.2951
Bag-in-Box with Overbox:	.4117



LAUNDRY DETERGENT

Liquid in a Stand-up Pouch with Fitment:	.2613
Liquid in a HDPE Detergent Bottle:	.4309
Laundry Pods in a Flexible Pouch:	.4026
Laundry Pods in a Flexible Pouch without Overbox:	.1634



PEANUT BUTTER

Stand-up Pouch:	.08491
Stand-up Pouch with Overbox:	.1255
PET Jar:	.08461



SHOES

Shoe Box with Flexible Pouch:	.3943
Shoe Box with Outer Overbox:	.6529



MAILER PACKAGING

Poly Mailer:	.06467
Bubble Mailer:	.1092
Paper Cushion:	.3425
Paperboard:	.4494

WATER USAGE

For cereal packaging, the bag-in-box option shipped without the overbox uses **+421%** more water compared to the stand-up pouch option.

WATER CONSUMPTION (L)



CEREAL

Stand-up Pouch:	12.50
Bag-in-Box:	65.10
Bag-in-Box with Overbox:	100.98



LAUNDRY DETERGENT

Liquid in a Stand-up Pouch with Fitment:	69.61
Liquid in a HDPE Detergent Bottle:	91.16
Laundry Pods in a Flexible Pouch:	118.25
Laundry Pods in a Flexible Pouch without Overbox:	60.11



PEANUT BUTTER

Stand-up Pouch:	22.01
Stand-up Pouch with Overbox:	28.08
PET Jar:	25.21



SHOES

Shoe Box with Flexible Pouch:	94.23
Shoe Box with Outer Overbox:	92.68



MAILER PACKAGING

Poly Mailer:	24.70
Bubble Mailer:	36.68
Paper Cushion:	195.68
Paperboard:	124.56

HIGHLIGHTED BENEFITS

SOURCE REDUCTION BENEFITS (FEATURING HIGHLIGHTED RATIOS)

Flexible packaging provides source reduction, which is one of the most preferred methods of waste management according to the U.S EPA Waste Hierarchy.

As a result, flexible packaging offers a high product-to-package ratio:



RECOVERY BENEFITS

Even after taking into consideration the recycling rates for all packaging material types, the peanut butter, mailer, cereal, and laundry detergent case studies show that the flexible packaging options sent the least amount of material to landfill.



For more information and methodologies of assessments, please visit www.flexpack.org to download the “Sustainability and Life Cycle Impacts of Flexible Packaging in E-commerce” report. For additional findings on the impact of flexible packaging on dimensional weight and shipping costs, visit www.flexpack.org/resources/sustainability-resources.