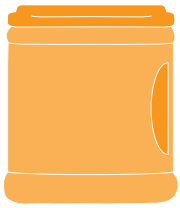
LIFE CYCLE ASSESSMENT
COFFEE PACKAGING CASE STUDY

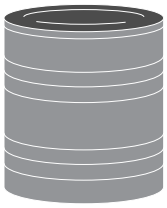
COFFEE PACKAGE COMPARISON

Ground coffee is a popular beverage and is packaged in a variety of package formats. For this Life Cycle Assessment (LCA) study, the stand-up flexible pouch, steel can and plastic canister package formats were evaluated for their environmental impacts with a cradle to grave boundary.

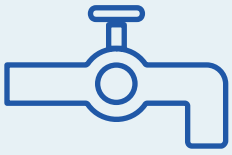
STAND-UP FLEXIBLE POUCH



HDPE CANISTER



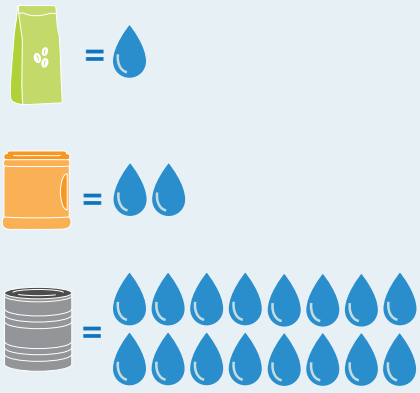
STEEL CAN



WATER CONSUMPTION

The steel can uses **16x** as much water as the stand-up flexible pouch, mainly during the material development stage, as large amounts of water are used during the cooling process in the formation of steel.

The HDPE plastic canister consumes **2x** as much water as the stand-up flexible pouch due to water usage during the injection molding process.



GREENHOUSE GAS EMISSIONS

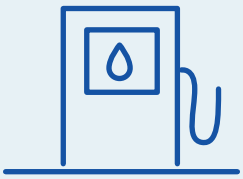
The production of steel cans and the HDPE canister both require much more energy and have higher carbon emissions in the manufacturing or conversion stage. The carbon impact is lower for a lighter stand-up flexible pouch that holds more of the product and uses less material.

The HDPE canister and steel can respectively emit **4x** and **7x** more GHG emissions than the flexible pouch.

13.7 GRAMS of material

63.7 GRAMS of material

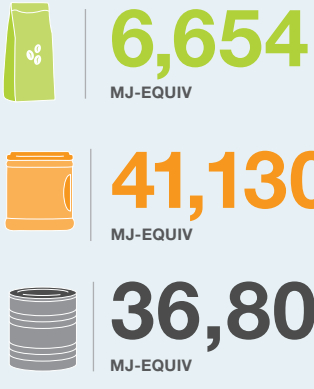
111 GRAMS of material



FOSSIL FUEL CONSUMPTION

A flexible pouch has a lower overall fossil fuel usage.

A steel can and HDPE canister respectively use **453%** and **518%** more fossil fuel than a stand-up flexible pouch.



6,654 MJ-EQUIV

41,130 MJ-EQUIV

36,809 MJ-EQUIV

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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.

High product-to-package ratios associated with flexible packaging enable packaging efficiency.

High product-to-package ratio:

96% Product weight | **3.9%** Package weight

Low product-to-package ratio:

83% Product weight | **17%** Package weight

67% Product weight | **33%** Package weight

RECOVERY BENEFITS

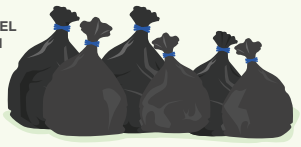
STAND-UP FLEXIBLE POUCH

1x
net rate of landfilled material

HDPE CANISTER

2.5x
net rate of landfilled material vs stand-up flexible pouch

STEEL CAN



3x
net rate of landfilled material vs stand-up flexible pouch

While many flexible packaging formats 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.

For the HDPE canister to have the same net discards as the flexible pouch package, the recycling rate for the HDPE canister would need to jump from **34%** to **84%** with a **70%** recovery rate for the lid.

The recycling rate for the steel can would need to increase from **71%** to **93%** and the LDPE lid would need to go from **21%** to **75%** for the steel can to have the same amount of landfilled material as the stand-up flexible pouch.

IMPLICATIONS

The stand-up flexible pouch results in a more favorable environmental outcome from a carbon impact, water consumption and material discarded position than the other coffee packaging formats. This is driven by the lower amount of packaging material used, which results in a favorable product-to-package ratio.

FORMAT	FOSSIL FUEL CONSUMPTION (MJ-EQUIV)	GHG EMISSIONS (KG-CO^2 EQUIV)	WATER CONSUMPTION (L)	PRODUCT-TO-PACKAGE RATIO (%)	PKG LANDFILLED ((G)/1000 KG COFFEE)
STAND-UP FLEXIBLE POUCH	6,654	353	1011	96:4	40,294
PLASTIC (HDPE) CANISTER	41,130 **(+518%)**	1678 **(+376%)**	3,164 **(+213%)**	83:17	142,063 **(+252%)**
STEEL CAN	36,809 **(+453%)**	2763 **(+683%)**	17,238 **(+1605%)**	67:33	163,122 **(+304%)**

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For more information and methodologies of assessments, please visit www.flexpack.org to download Flexible Packaging Association's "A Holistic View of the Role of Flexible Packaging in a Sustainable World" report and refer to pages 138-176.