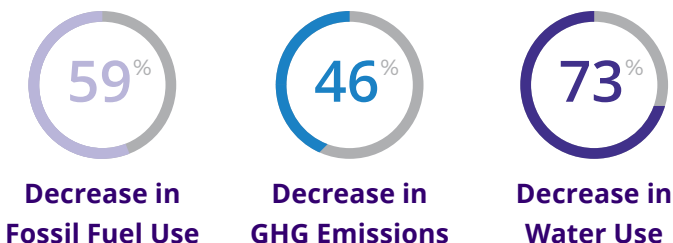


Environmental Benefits Of Reusable Shippers

Determining the environmental impact of shipping systems can be challenging to quantify. The origin, use, transport, and disposal of various components all must be considered to calculate the full impact. This can be further complicated when evaluating reusable shippers which have additional factors to consider. We know from the adage "Reduce, Reuse, Recycle," that reusables are usually a good choice, but how do they measure up in real world applications?

To understand the real environmental benefits of reuse, Cold Chain Technologies (CCT) collaborated with Trayak, a sustainability consulting and software company, to conduct a Life Cycle Assessment (LCA) comparing CCT's single-use and reusable shippers. Trayak used their Ecolmpact-COMPASS software to model CCT's shippers and conduct the LCA according to the requirements of International Standard ISO 14044:2006. This work was then further reviewed by a 3rd party to confirm its conformance to relevant ISO standards.

The results showed that reusable options had lower environmental impact than the comparable single-use shipper, including for indicators such as Fossil Fuel Use and Greenhouse Gas (GHG) Emissions. Considering our reusable CCT Ecoflex Extended 6L shipper specifically, the improvement for a short-distance shipment over 20 shipments was:



Many factors are at play to keep the environmental impact low for a reusable fleet, and each real shipment's impact is different depending on location and local infrastructure. From conducting this study, we have been able to identify some of the most important ways to lower impact in the field:

- **High Return Rates – There's no reuse without returning the shipper**
- **Low Damage Rates – Robust design protects both the product and reusable components**
- **Shrink the Loop – Closer refurbishment sites cut unnecessary transport**

As you can see, lower environmental impact is a group effort! We depend on our external partners, customers, and internal team to make reuse feasible from both an environmental and business perspective.

Contact us to see how the CCT's Reusable Shippers can help your company unlock your company's sustainability goals.

**All values and figures presented here are taken from our LCA report prepared May 4, 2022. A copy of the report containing the study and the third-party attestation of ISO compliance is available upon request.*



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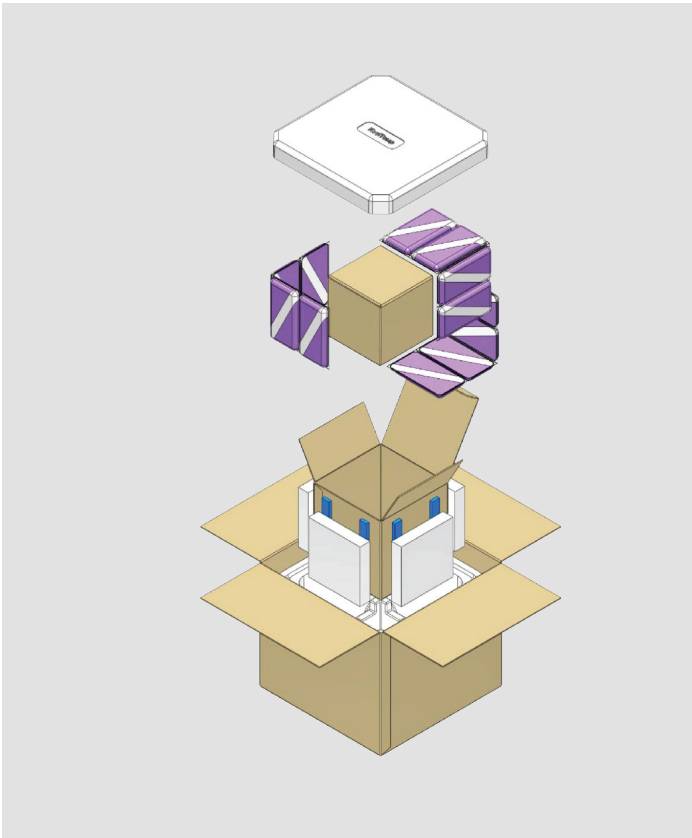


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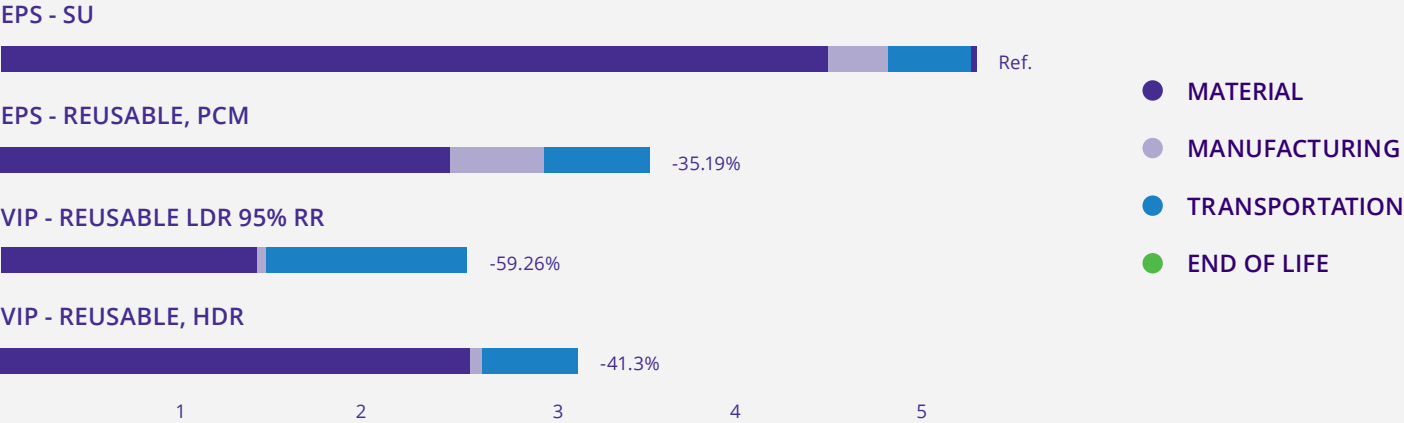
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Side-by-side picture of the two product lines compared in the report. Specifically, our Excel 6L (EPS) and Ecoflex Extended 6L (VIP) shippers were modeled.

Fossil Fuel Use (GJ Deprived)



Detailed look into the Fossil Fuel Use indicator results for short distance transport.



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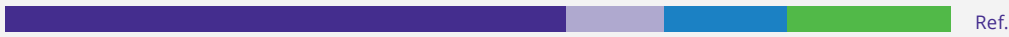
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GHG Emissions (kg CO₂ eq.)

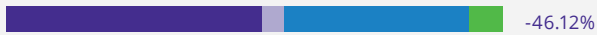
EPS - SU



EPS - REUSABLE, PCM



VIP - REUSABLE LDR 95% RR



VIP - REUSABLE, HDR



50 100 150 200

- MATERIAL
- MANUFACTURING
- TRANSPORTATION
- END OF LIFE

Detailed look into the GHG Emissions indicator for **Short Distance Transport**.

Fossil Fuel Use (GJ Deprived)

EPS - SU



EPS - REUSABLE, PCM



1 2 3 4 5 6

- MATERIAL
- MANUFACTURING
- TRANSPORTATION
- END OF LIFE

Detailed look into the Fossil Fuel Use indicator results for **Short Distance Transport**.

GHG Emissions (kg CO₂ eq.)

EPS - SU, Long Distance



VIP - REUSABLE, LDR, Long Distance



50 100 150 200 250 300

- MATERIAL
- MANUFACTURING
- TRANSPORTATION
- END OF LIFE

Detailed look into the GHG Emissions indicator results for **Long Distance Transport**.



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Water Use (m³)

EPS - SU



EPS - REUSABLE, PCM



VIP - REUSABLE LDR 95% RR



VIP - REUSABLE, HDR



20 40 60 80 100

● MATERIAL ● MANUFACTURING ● TRANSPORTATION ● END OF LIFE ● Use Phase

Water Use for **Short Distance Transport**.

Water Use (m³)

EPS - SU



EPS - REUSABLE, PCM



20 40 60 80 100

● MATERIAL ● MANUFACTURING ● TRANSPORTATION ● END OF LIFE ● Use Phase

Water Use Phase Breakdown for **Longer Distance Comparison**.

List of Acronyms and Abbreviations

LCA	Life Cycle Assessment	LDR	Low Damage Rate
GHG	Greenhouse Gas Emissions	HDR	High Damage Rate
RR	Return Rate	EPS	Expanded Polystyrene
VIP	Vacuum Insulated Panel	SU	Single Use
PCM	Phase Change Material		



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