



A Brambles Company



Timo Galitz

Supply Chain and Operations Management
CHEP Automotive and Industrial Solutions

Work focus:

- LCA modelling (Umberto + ecoinvent)
- Pooling systems for reusable packaging
- Intercontinental transports

Title

Comparative LCA for reusable and one-way packaging in automotive supply chains

Abstract

Supply chains of the automotive industry are experiencing an increasing demand for intercontinental transport. At the same time businesses urge for more sustainable products and processes. CHEP supports their customers in this development with reusable packaging solutions in a pooling system that saves costs and reduces environmental impacts.

The presented case study in cooperation with a large OEM compares reusable and one-way packaging following the LCA methodology. The investigated supply chain includes OEM plants, supplier production sites, and CHEP service centers in Europe and South Africa. Umberto LCA models were developed for the IsoBin 33 (reusable container) and for one-way packaging (pallet and corrugated box) using ecoinvent data. The cradle to grave approach allowed to investigate CO₂ emissions, waste generation, water depletion, wood consumption, and energy demand for all life cycle phases. To enhance the precise allocation for all modes of transport in scope, a tool was designed to supplement the calculation process.

The analysis concludes that the reusable container has a lower environmental impact across all regarded categories for the investigated use case. Results show 5 - 17% reduced CO₂ emissions, 90% reduction of waste, approximately 90% less wood consumption, 50% less water depletion, and up to 25% less energy consumption. The long-distance transport processes significantly influence the amount of CO₂. Therefore, the logistics efficiency of the packaging system is a determining factor of how much CO₂ emissions can be reduced. The study was coordinated and reviewed by Cologne University of Applied Sciences and an external LCA expert.