
Ecological and economic assessment of reusable packaging in a refrigerated supply chain

Abstract

In alignment with the objectives of the French anti-waste law for the circular economy, particularly the 3R decree, the Chaire CoPack launched a research project to assess the implications of transitioning from a linear economy to a circular economy through the adoption of reusable packaging. Data collection in the field enabled the research team to conduct an initial study comparing the environmental impacts of various approaches to product distribution, with a specific focus on the bread supply chain, involving both reusable and single-use packaging.

Life Cycle Assessment (LCA) was employed for analysis, revealing that employing reusable packaging could present an environmental advantage when cleaned after approximately four usage cycles. The technical and economic evaluation demonstrated a marginal advantage over single-use packaging, albeit with increased operational complexity. However, as the frequency of cleaning increases, the environmental benefits of reusing packaging diminish, primarily due to heightened energy consumption associated with heating the cleaning water. The preliminary findings from this study will be complemented with industry feedback to gain insights into the challenges and opportunities surrounding the transition to reusable packaging, considering the technical and economic challenges of this shift.

Keywords: reusable packaging, logistics, LCA