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Using Environmental Life Cycle Assessment to Design Sustainable Packaging

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Abstract : There are conflicting purposes at play with the design of sustainable packaging which include material reduction, recycling compatibility, use of secondary content and performance of the package in protecting and delivering the product. Life Cycle Assessment (LCA) is able to evaluate these different strategies against environmental metrics such as climate change, land and water use and marine litter pollution. However, LCA has traditionally been too time consuming and expensive to be used effectively in packaging design process. To make LCA practical for packaging technologist and designers a simplified tool is needed to make LCA possible for non-environmental specialists. The Packaging Quick Evaluation Tool (PIQET) is a web-based solution for undertaking LCA of new and existing packaging designs considering the global supply chain and impacts from cradle to grave. PIQET is based on a pre-calculated LCA database covering the materials and processes involved in the packaging lifecycle from cradle to grave. This includes both virgin materials and recycled content, conversion of materials into packaging, and the transportation of packaging to the product filling. In addition, PIQET assesses the impacts once the package is filled looking at storage, transport and product loss through the supply chain. When applied to consumer packaging light weight packages which are note recyclable have lower impacts than more recyclable packages which have a higher mass. Its also apparent that for many products the impacts of product failure and product loss are more important environmentally compared to packaging material efficiency.

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