Bio-based plastics
Case study
Elastopoli Oy (I)

Elastopoli Oy is Finnish company located in Sastamala, which has been established in 2002. Elastopoli Oy develops and manufactures compounds out of natural fibers and minerals. The polymer matrices used include e.g. polypropylene, polystyrene and biodegradable polymers. This company also provides testing services and Technical Expertise Management to their customers for an effective use of compounding materials. Moreover, Elastopoli Oy is actively involved in research projects, including EU-funded ones. Elastopoli Oy, has applied the bio-based plastics LCA to go tool in order to analyse the environmental impact profile of a PLA thermoformed tray includes micro-fibrillated cellulose (MFC) and PLA sealing film which is under development as a demonstrator in the EU-funded project NANOBARRIER.

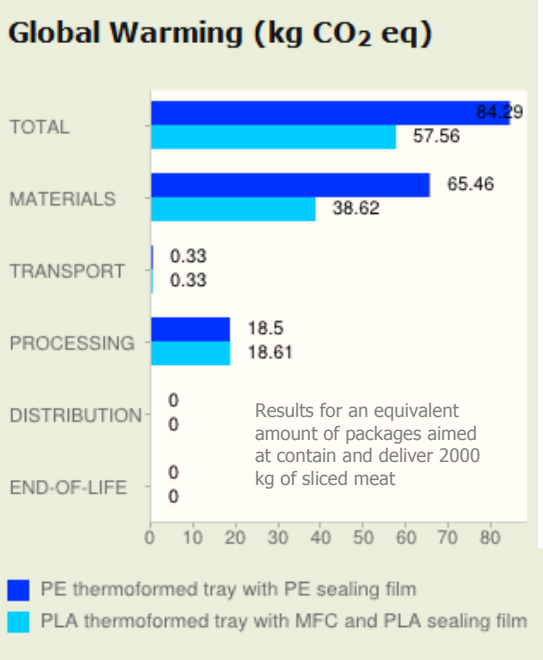

Figure 1. Global warming results for thermoformed trays with sealing film

Elastopoli Oy decided to join the training program of LCA to go, with the support of ITENE. The main driver to join this training was their constant cooperation with their customers, mainly packaging manufacturers, where carbon footprint is an increasing concern.

Several ecodesign strategies were proposed by the company. ITENE assisted Elastopoli Oy during the decision process to find the best ecodesign strategy. Finally, it was decided to focus on a material change from the current thermoformed PE tray to a bio-based PLA tray incorporating MFC for enhanced barrier properties and strength. Therefore, the ecodesign with the bio-based plastic LCA to go tool was focused to optimize the quantity of material by the use of Ashby comparative indexes for mechanical design.

Considering the enhanced strength that the MFC is capable to provide to PLA, the thickness was reduced as well as the weight of the package. Even though a physical prototype was not available, it was possible to estimate a material reduction by using different indexes (related with the mechanical properties of the material). This change in the base material of the tray resulted in a carbon footprint minimization up to 30%.

Markku Nikkilä, CEO at Elastopoli Oy, appreciated the results of LCA to go analysis, as a guide to validate their strategies for environmental impact reduction.

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