

Bio-based plastics

Case study

Polykemi AB



Polykemi AB is a Swedish company specialized in the field of production of custom-designed plastic compounds for a variety of applications (automotive industry, packaging, furniture, leisure and sport equipment, etc.). Polykemi AB has decided to use the LCA to go tool in order to search, through LCA, of sustainable alternatives on compounds in the automotive sector.

Because of their interest on such analysis, Polykemi AB decided to join the training and case study programme of LCA to go with the support of ITENE. The main driver to join this training was basically their interest on searching of material alternatives, including bio-based ones, for automotive use.

In this case study developed with Polykemi, the bio-based plastics LCA to go tool was used to carry out a cradle-to-gate LCA of two different centre consol carriers produced by one of Polykemi's customers based on glass fibre (GF), as well as explore a new bio-based alternative based on PLA and abaca fibres. The PLA+abaca fibres alternative was selected after a deep search for materials with similar mechanical properties than PP+30%GF followed with an estimation of final weight. Therefore, the following systems were analysed: (a) PP+30%GF (used as benchmark), (b) PA+30%GF, (c) PLA+30%Abaca fibres. The LCA was focused only on Global Warming (GW) and Cumulative Energy Demand (CED).

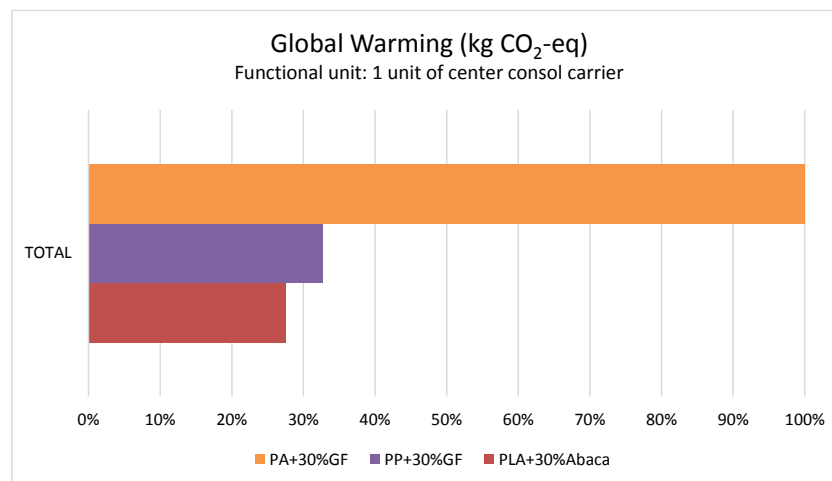


Figure 1. Global Warming results in relative percentage for a center consol carrier

A first screening cradle-to-gate LCA with the tool shows that the bio-based alternative made of PLA+ 30%Abaca fibres shows the lowest carbon footprint for the three analysed systems. On the contrary, the PLA+ 30%Abaca have slightly high CED

than the benchmark system

of PP+30%GF, mainly due to the contributions of renewable CED during crop growing and harvesting. The central consol carrier made of PA+30%GF has higher impacts to GW and CED due to the impacts from PA production.

Karl Banke, from Technical Support Department at Polykemi AB pointed out that *“working with the LCA to go tool has been very useful to learn about the impacts and improve the environmental behaviour of our compounding materials for automotive applications”*.