

Final Report

Project acronym: *HyBiCo*

Project number: 4297

M-ERA.NET Call 2016

Period covered: 02/05/2017 to 28/02/2021

Publishable project summary

The HyBiCo project gave an opportunity to develop novel high-tenacity PP matrix composites reinforced with short PET fibres. These composites can be processed using standard compounding and injection moulding machinery and are characterised by a superior impact resistance. The demonstration products manufactured at injection moulding plant proved that developed composites can be implemented in the plastic industry without a need for additional investments from processors interested in their application. The second type of biobased PP composite manufactured within the scope of the project was reinforced with rayon viscose fibres which can be efficiently hybridised with lignocellulose microfibrils for cost reduction and increase of biobased content without great reduction of initial mechanical properties. Furthermore the conducted optimisation allows to tailor the contents of hybrid reinforcement for the designed mechanical properties within the set material's cost constraints. The hybridisation can be done using a market available wood flours or lignocellulose microfibrils from grain husks. The developed processing and microbiological stabilisation of these agriculture by-products can turn them into a valuable reinforcement that can substitute wood flour to obtain more sustainable plastic end-product. In addition, biobased PP nano- and hybrid composites with nanoclay reinforcement and lignocellulose microfibrils, derived from grain husks as agricultural by-products, were developed. It was demonstrated that addition of nanoclay reinforcement contributed to improved thermal resistance and increased stiffness of the composites.