

Contract No: **T2EDK-00008-KYKA**

Title: **Green and recyclable and/or compostable composite products with improved properties of industrial hemp waste in the context of the circular economy**

Duration: **16/06/2020-15/07/2023**

Abstract:

The subject of this project is the construction of new composite products from agricultural residues (non-useful parts of industrial cannabis strains) and polymers from renewable sources or recyclable materials. In particular, the outer part of the stem of the cannabis (hemp) plant will be separated from the inner part by a special defibrillating machine. The physical and thermal properties of the woody part and the fibers will be examined by various measurements to identify the optimum conditions for their use in the production of composite products. The internal woody part will be cut down appropriately for use in the manufacture of Wood Based Panels (WBP) together with Phenol-Formaldehyde-type adhesives developed by partial replacement of phenol with soy protein. The ready-made boards will be dismantled and re-used in the production of new hemp and wood boards (as part of the new material in ratios of 5-50%), to assess their recyclability. Fibers from the outer part of the hemp stem will be used as reinforcing materials of recycled high-density polyethylene (HDPE) and bio-polyester from renewable materials, to manufacture composite products of Wood Plastic Composite (WPC) type. The proposed WBP and WPC products are innovative and will be appropriate for use in the manufacture of furniture (WBP) and articles, interior and exterior constructions, door frames and door panels, but also in the automotive industry (WPC). The main advantage of these new products is their lower cost and weight, as well as their increased friendliness to humans and the environment.

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