

## TITLE: Sustainable monomers for sustainable coatings

### Summary:

Ambitious European policies on climate neutrality mean that the EU industry, and the European coatings sector will have to decarbonise in the coming three decades (2050). To achieve these reduction levels, current petrol-based raw materials will need to be replaced by bio-based *drop-in* replacements and/or performance adequate alternatives. Secondly, production technologies will need to be dramatically improved, and new technologies need to be developed at the industrial level.

Helios TBLUS d.o.o. (part of Kansai Paint Group) seeks for sustainable materials for coatings. Since resin/polymer is the major and most important component of the industrial coating, the necessity to find and develop polymers with low carbon footprint is obvious. In recent years, cooperation with National Institute of Chemistry was established. Some *drop-in* bio-alternatives were identified, and initial studies were performed. E.g. bio-Methacrylic acid concept was evaluated. In next steps bio-Adipic acid and furane-based diols should be evaluated in polyester polymers. Itaconic acid and its esters should be developed and evaluated as replacement for acrylic-based coatings. Detailed reaction kinetics calculations will need to be developed to overcome intrinsic low reactivity. Additionally, Life Cycle Assessments (LCA) will need to be performed in order to quantify environmental benefits.



### Research techniques used:

New resins and coatings will be thoroughly evaluated by chemical (e.g. IR-spectroscopy, GPC, HPLC), physical (e.g. hardness, elasticity, colour value, gloss, rheology) and application (spraying) characteristics. Coated panels will be exposed to natural and accelerated weathering (Xenon, UV, salt-spray chambers) to evaluate coating performance.

### The reason why the topic is innovative:

At the moment coatings market offers very limited amount of sustainable coating technologies. This is especially true for industrial coatings where performance and price efficiency are of great importance. This research will address the problem from the beginning of material value chain – sustainable (bio-derived) monomers are crucial to produce sustainable resins as foundation for sustainable coatings.

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