Press release |

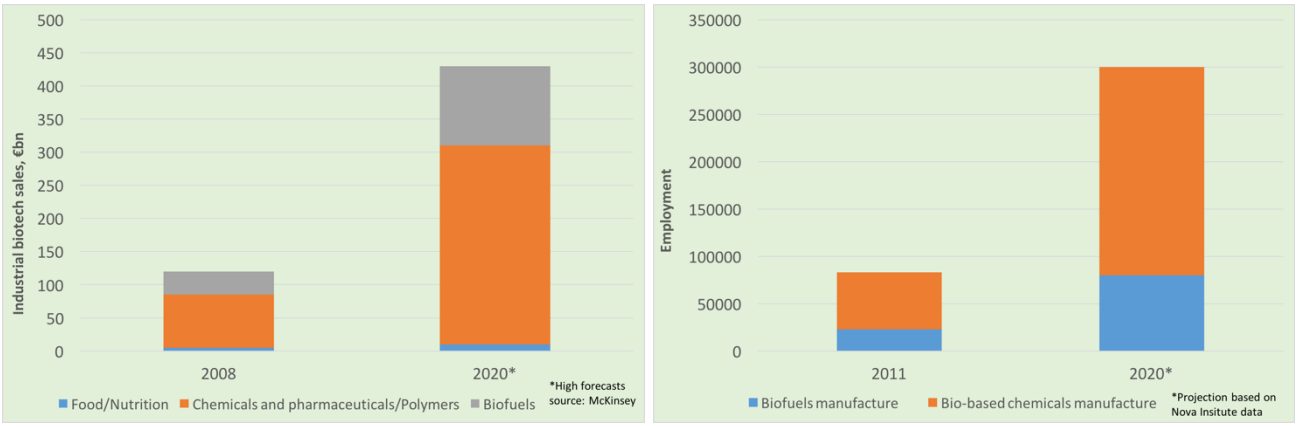
Press release
March 1, 2016

New European Horizon 2020 innovation project launched on ultrastrong, fully biobased composite materials

Louvain-la-Neuve, March 1, 2016 – IBA, the global leading supplier of electron beam and X-ray solutions for industrial applications, and CENTEXBEL, the Belgian research centre for textiles and plastics, are part of the newly approved Horizon 2020 project BIO4SELF. Within this innovation project IBA and CENTEXBEL, as part of a European consortium, will contribute to the development of novel PLA materials for composites.

The worldwide demand for replacing fossil-based raw materials for the production of polymers leads to a significant growth of ***bioplastics*** in terms of technological developments.

An assessment done by the European Commission has indicated that bio-based products and biofuels represent approximately € 57 billion in annual revenue and involve 300,000 jobs. According to the forecasts, the bio-based share of all chemical sales will rise to 22 % by 2020, with a compounded annual growth rate of close to 20 %.



Left: Expected Biotech Sales (Source: McKinsey). Right: graph showing the expected "biobased" employment growth (Source: Nova Institute).

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However, **there still exist drawbacks that prevent the wider use and commercialisation of biobased material. Two important ones**:

- **Lower mechanical performance:** although PLA can already replace conventional materials (like polyester) for quite some applications, its limited mechanical strength is still hampering commercial application.
- **Limited durability:** for application with long lifetime, PLA is not optimal yet due to its limited hydrolytic stability.

Enhancement of these properties remains an important challenge for biobased polymers. There is a need to develop biobased, sustainable polymeric materials with high stiffness, high impact and high durability without impairing recyclability.

The BIO4SELF project will tackle these drawbacks and aims for unprecedented stiffness by combining PLA (the largest used biopolymer) **with a bio-LCP** (Liquid Crystalline Polymer) to create an extra reinforcement level. Furthermore, the temperature resistance of PLA and its durability will be improved. The latter via adding well-chosen anti-hydrolysis agents. Further, inherent self-functionalization via photocatalytic polymers (self-cleaning properties), tailored microcapsules (self-healing) and deformation detection fibres (self-sensing) will be added.

The potential of the biobased materials will be proven in advanced prototypes for automotive and home appliances. Cost-efficient production of fully biobased composites meeting the demand for high technical performances and sustainability will be pursuit by investigating the performances of new biobased materials in plastic manufacturing. To reach this goal, the whole value chain will be considered within BIO4SELF (see figure below).

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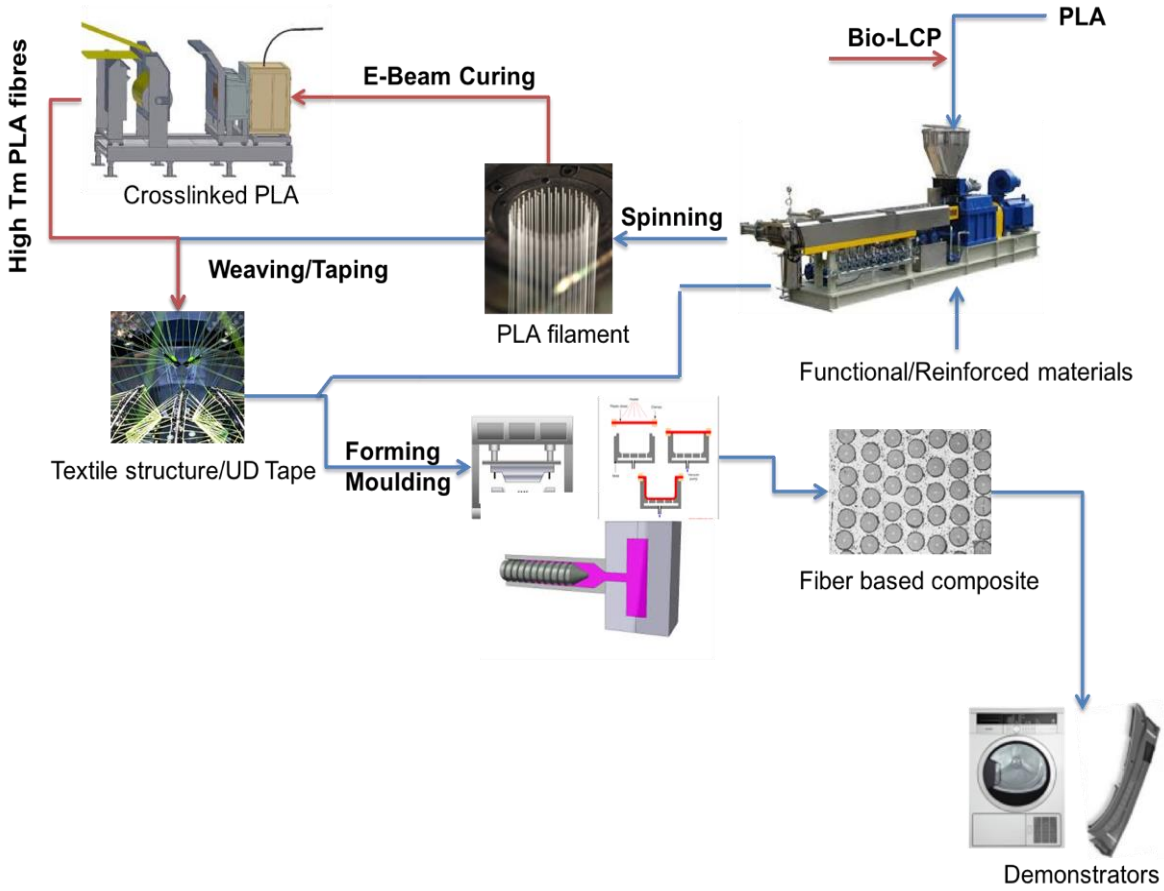

From PLA raw material to actual products – an overview of the BIO4SELF project scope.

IBA's role in the project is the electron beam treatment of PLA to improve the thermal stability and the stiffness of the developed materials. Given its expertise and long standing experience, CENTEXBEL is responsible for the melt spinning of PLA filaments.

"*We are excited to use our experience and electron beam technology to develop the next generation of biodegradable and sustainable fibres which will be used in our everyday lives. The BIO4SELF project and the collaboration with CENTEXBEL will bring us the application related competences*

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required to develop an optimal solution for this industry." says Philippe Dethier, Marketing and Business Development Director at IBA.

The BIO4SELF consortium is strongly industry driven, including 5 large enterprises and 5 SMEs. These are completed with 3 universities and 3 research centres. This way BIO4SELF covers all required expertise and infrastructure from academic, applied research and industry from 10 different EU countries (for a detailed overview of the consortium, see next page).

BIO4SELF is an H2020 project, meaning that it is co-funded by the European Union (grant of 6.8 million €). It will last 40 months and started on March 1st, 2016. CENTEXBEL is the coordinator of the entire European project.

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BIO4SELF Consortium

Beneficiary	Roles
CENTEXBEL	Coordinator of the project and responsible for the melt spinning of PLA filaments and their testing
DTU	Based on their unique expertise regarding composite and materials mechanics, they will produce composite and they will test them on semi-industrial scale combined with multiscale modelling
ITA | RWTH AACHEN UNIVERSITY	Responsible for the melt spinning of PLA filaments and the structuring into hybrid yarns and textile fabrics, based on their competences in textile technology.
Fraunhofer ICT	Development of new compound formulations (additives, stabilizers) and of the new material compositions and processing and the use of sensitive compounding. Process parameter optimisation.
UM	Being specialised in biobased materials, they will be responsible for the combination of PLA with bio-LCP and the modelling of the structure-processing-property relations
NEXT TECHNOLOGY TECNOTESSILE	The role in the project will be both the self cleaning functionalization of the biobased materials, pilot scale optimisation of irradiation process as well the environmental assessment of the new products via Life Cycle Analysis.
MAIER	Definition of specification and requirements for the production of a prototype for the automotive sectors.
arçelik	Production and evaluation of a household appliance part from the novel biobased materials.
COMFIL®	As SME focused on thermoplastic composites, it will produce composite intermediates (UD-tapes, fabrics, pellets and consolidated plates) by replacing current products by biobased alternatives.

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TECNARO The Biopolymer Company inside	It will apply its expertise in biobased compounding for the production of functionalised pellets
CHEMOSVIT FIBROCHEM	Production and further drawing of PLA filaments at an industrial scale, leading to high stiffness filaments.
MIRTEC BETAM	Their role is focused in the improvement of the PLA durability and the realisation of the self healing functionality
iba	Responsible for the electron beam treatment of PLA to improve the thermal stability and the stiffness of the developed materials
stw	R-Tech role is to perform the environmental and economic evaluation of the new biobased materials. Special attention will be given to end-of-life scenarios and the safe-handling and safe-use of any type of nanomaterials.
OSM	Responsible for the exploitation and dissemination, including business planning, intellectual property and technology transfer.

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