BIOTEXFUTURE Fall Forum 2023
Post-event report

“Fast Fashion will be out of fashion” - When the European Commission published its EU Textile Strategy 2030 in March 2022 it suddenly became clear that tremendous changes are lying ahead of the textile industry. Transforming its consumption and production pattern from linear to circular, finishing overproduction, the excessive wastage of natural resources and the application of hazardous chemicals in the manufacturing processes in just seven years, this seems to be like a paradigm shift for this rather traditional industry. Therefore, new ideas are urgently required! In this context, biology and bio-based materials as a replacement for crude oil-based polyester or harmful finishing or dying products may stand for a very new approach and a ray of hope for the sector.

This is where the innovation space BIOTEXFUTURE and the project results of the individual projects, implemented in this framework, are coming into play. Under the headline: “How we support the change”, four already or nearly finished projects teams presented their results for the first time officially on European level and gave an impression of potential new approaches, whereof one or two may already be applicable right now of in the foreseeable future.

Keynote – Political perspective

The day started with a very inspiring keynote from **Pernille Weiss, Member of the European Parliament** and representative of the EP- ENVI Committee on “Environment, Public Health and Food Safety” as well as the ITRE Committee on “Industry, Research and Energy”. As political expert on textiles and the textile sector, Ms Weiss clearly emphasized that this highly polluting sector urgently requires a substantial transformation. The EU Commission therefore launched the EU Textile Strategy 2030 followed by a wave of simultaneous legal initiatives addressing the major environmental and structural challenges of this sector:

- The “Ecodesign for Sustainable Products Regulation” (ESPR) proposed in 2022 is supposed to create a framework for environmentally friendly product requirements for textiles.
- The proposal for a “Green Claims Directive” aims to tackle greenwashing and to empower end-consumer to assume informed buying and consumption decisions on eco-sound products.
- The revision to the Waste Framework Directive aims to introduce mandatory and harmonised Extended Producer Responsibility (EPR) schemes for textiles in all EU Member States.
- The Waste Shipment Regulation, proposed in 2021, intends helping to restrict the export of textile waste to third, non-EU, countries.
- The Transition Pathway for the Textiles Ecosystem, published in 2023, and the European Circular Economy Stakeholder Platform (already launched in 2018) as communication mechanisms to promote and foster cooperation between industry, public authorities, social partners and other stakeholders.

Finally, Ms Weiss discussed the urgent need for the development of new technologies and manufacturing processes in the textile industry which are supported via the EU research program “Horizon Europe”. To achieve these ambitious targets the textile sector requires to join forces on political and industrial level whereby new approaches, innovative ideas, and further exchange on an EU level are highly welcome.

Textile industry and textile research perspectives

Kathrin Jaenecke, Senior Policy Officer - Innovation & Skills of **EURATEX**, The European Apparel and Textile Confederation, provided an overview from an industry perspective. Ms Jaenecke emphasised the necessity of large-scale initiatives and alliances with a variety of partner organisations from different sectors to address the “sustainability challenge” of the textile sector in the upcoming years. In July 2023, EURATEX proposed the “STEP 2030

– Sustainable Textiles European Partnership" as a Public Private Partnership within the European research and innovation framework programme HORIZON EUROPE. The aim of STEP 2030 is to promote innovations for circularity and sustainability in the textile ecosystem, as well as to advance textile recycling throughout the value chain - a separate initiative complementing BIOTEXFUTURE research activities on a broader EU level. Ms Jaenecke highlighted that 16 legal proposals addressing the textile sector are planned to be implemented in the years to come. In conclusion, it is a challenging time for everyone and therefore collaboration between stakeholders is essential.

Finally, Prof. Dr Thomas Gries from ITA, Institut für Textiltechnik, RWTH Aachen University concluded

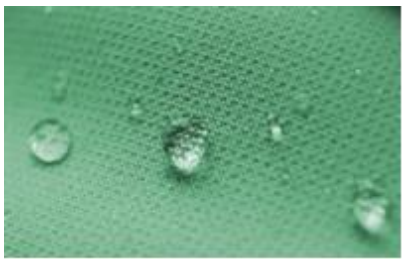
the introductory section with a presentation of the **BIOTEXFUTURE** initiative as one of four German innovation spaces funded by the German Ministry of Education and Research (BMBF) on bio-economic research. While BIOTEXFUTURE is the only program addressing the textile sector, the other three innovation spaces are referring to the food and nutrition industry, regional waste recycling or new marine-based bio-feedstocks. BIOTEXFUTURE is organised in cooperation between RWTH Aachen University with adidas AG as industry partner. Their common objective is the transformation of the textile value chain from petroleum-based to bio-based. BIOTEXFUTURE is an umbrella program for various technical projects addressing substrate or material development, process development, textile finishing, or circular economy to realise this transformation and create the change. All this is accompanied by social-science on the bio-economic transition of society in the framework of the "TransitionLab", led by the Chair of Sociology of Technology and Organization (STO), RWTH Aachen University. The BIOTEXFUTURE network consists of more than 100 organisations from research and industry all collaborating to holistically transform the textile sector.

Furthermore, Prof. Gries provided an outlook of the potential options for the further development of BIOTEXFUTURE on EU level. With such an existing network it might be highly desirable to further grow, address many more currently underrepresented research areas such as textile colours and dyes or the recyclability of new bio-based textile polymers and to jointly bridge the gap between scientific research results and industrial application.

4 BIOTEXFUTURE projects on stage

In the second part of the day, four BIOTEXFUTURE projects that have already come to or are close to an end were presented. All of them have been addressing highly relevant textile topics currently on the EU agenda, such as the ban of microplastic infill material for artificial sport turfs, new bio-based textile finishes due to the expected large-scale EU-ban of PFAS (Per- and Polyfluorinated chemicals) or with

new options for elastic fibre production currently on the research radar as a consequence of the foreseen EU-wide prohibition of the toxic DMF (Dimethylformamide) as solvent for the elastane manufacturing process.



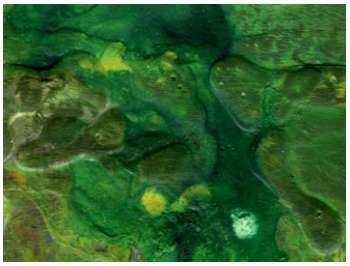
Dr. Felix Jacob, biotechnologist with focus on protein engineering for material science and researcher from the DWI (Leibnitz Institute for Interactive Materials, Aachen) presented the project **BIOCOAT.** The aim of the is the development of bio-based textile finishes for high performance apparel such as sportswear and medical textiles. Within the framework of the project the team explored the option to apply new textile coatings using nature-derived peptide instead of the conventional chemistry used in textiles today. The team was able to show wash-resistant, antimicrobial effects of the bio-based finishes on a laboratory scale. Especially in the medical field, the team achieved impressive results by proving on laboratory scale the almost complete reduction of pathogenic bacteria by an antimicrobial peptide finishing. Meaning, this new coating might be able to provide a contribution to eliminate the multi-resistent dangerous hospital germs in future, which is urgently required, since these bakteria cause, only in Europe, around 25,000 fatal infections every year.

In the next session, Henning Löcken from the ITA presented the outcomes of the project **BIOTURF** on microplastic-free solutions for sport turfs. According to UEFA (Union of the European Football Associations), across Europe, more than 25.000 synthetic sport turfs are affected by this legal initiative. Consequently, public and private authorities, as operating entities, are obliged to engage in large scale modernization activities in the upcoming years. Currently, alternative solutions are quite rare, since infill material in general is considered as an essential component for artificial turf systems to ensure playing quality, stability and fiber-resistance as well as to provide a good floor grip for the football-players.

Within the project BIOTURF, the research team from ITA and TFI (Institute for building products focusing on interior design) in cooperation with the company Morton Extrusionstechnik developed an artificial turf structure made of bio-polyethylene (PE) to replace crude-oil based PE as raw-material. Moreover, they modified the spinning and weaving technology to create a robust and stable fabric structure as carrier layer for the single fibers to be able to avoid any additional infill granulate in general. The BIOTURF team managed to develop a “BIOTURF floor system” which they already installed in a small football pitch demonstrator (soccer box) at the Aachen University Sports Center. The brand-new artificial turf can be used by the public and players can provide feedback for improvement.

Next on the agenda was the **CO2Tex** project focusing on the research on commercially viable elastic filament yarns made from CO2-containing TPU (Thermoplastic polyurethane). They are a melt-spinning environmentally friendly alternative to the conventional dry-spinning but (DMF) solvent-based process

currently required for the elastane production. CO2-TPU yarns are not an entirely new development. They have already been on spun on pilot scale plants and transferred to textile demonstrator applications in the past, but further processing on industry scale has so far been challenging due to the tackiness of the product. The CO2Tex research team achieved to modify the melt spinning process and reduced the tackiness and are now able to produce CO2-TPU elastic fibers on industry level in a stable and reliable process. This final accomplishment is even more important since elastic filaments are used in 80 % of all apparel products and are thus a globally significant economic and ecologic factor. A non-toxic alternative for elastane is therefore urgently required by the whole textile sector.



The final presentation of the BIOTEXFUTURE Fall Forum 2023 was **ALGAETEX** on algae-derived biopolymers for the textile application. The aim of the ALGAETEX project is to demonstrate the general technical feasibility of producing thermoplastic biopolymers from algae for textile applications. After two years, the team is in the final stages of the project and is working on producing first textile demonstrators from an algae-based polyamide.

More information on all BIOTEXFUTURE projects can be found on our website: www.biotexfuture.info/projects

Project results will also be presented in Project Insight Sessions throughout the coming year!

The BIOTEXFUTURE Fall Forum 2023 was full of new insights and interesting and fruitful discussions with an expert audience in Brussels. There are tremendous challenges ahead of the textile sectors, but novel ideas, promising approaches and viable solutions are already appearing on textile research level. It is now up to all of us to support the change and help to scale up research results into industrial application.

We are looking forward to presenting new BIOTEXFUTURE projects at the BIOTEXFUTURE Spring Forum 2024.

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