Project title:	Biological transformation of textile recycling: Enzymatic, selective degradation of used textiles (EnzyDegTex)
Partner:	RWTH Aachen University: Institute of Applied Microbiology (iAMB) Institute of Biotechnology (BIOTEC) Institut für Textiltechnik (ITA)
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Mission Statement

The development and extension of circular economies will play a central role in the future for the security of supply in the Rhenish Mining Area, Germany and Europe. Textile waste has a very high, so far almost completely untapped potential, as its disposal currently takes place in a linear and non-circular manner. In Germany alone, more than 1.5 million tonnes of post-consumer textile waste from private households are generated annually. With current recycling approaches, it is not possible to recycle widely used textiles, e.g. in the form of polyester-cotton blends, in a sustainable way. These textiles are usually processed via so-called "downcycling" into low-quality products, e.g. painting fleeces or insulation materials. Further recycling of these products does not take place due to the lack of recycling possibilities.

The aim of project "EnzyDegTex" is to develop enzymatic degradation and recycling processes for textiles and to provide raw materials from textile waste for the chemical, plastics and textile industries. Target raw materials are e.g. mono- and oligomers for the synthesis of melt- or solution-spinnable polymers, which are subsequently processed into yarns and textile products.

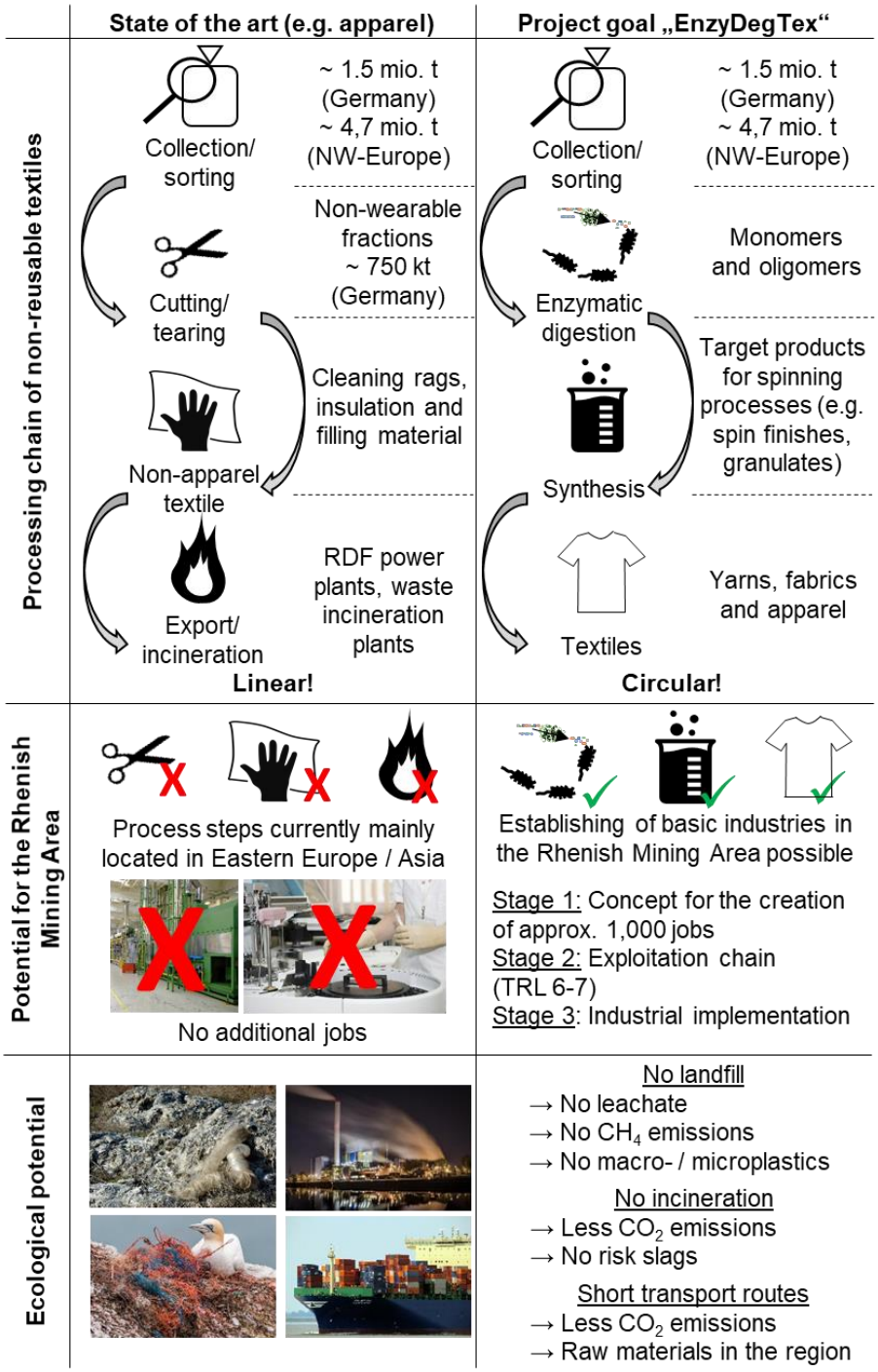

Fig. 1: Mission statement of project „EnzyDegTex“

Approach

The use of enzymes makes selective degradation possible and thus the design of custom-fit recycling processes. In these recycling processes, textile constructions can also be separated and their original materials returned, which cannot be separated according to the current state of the art.

For the development of enzymatic degradation and recycling processes for textile waste, process chains with the following steps are being investigated:

- Selection and preparation of textile waste
- Development and implementation of the enzymatic degradation
- Enrichment of suitable degradation products
- Synthesis of chemical base materials and products
- Development and validation of suitable spinning processes
- Development of textile products

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