

19–20 FEBRUARY 2026

**VAN DER VALK
AIRPORTHOTEL
DÜSSELDORF –
GERMANY**



**SUCCESSFUL R&I
IN EUROPE 2026
13th EUROPEAN
NETWORKING EVENT**

Call Topic: **HORIZON-CL6-2026-01-CIRCBIO-02** Advancing recycling technologies for mixed post-consumer textiles waste from blended products

Project Idea: Scale-up of Polycotton Textile Waste Valorization toward EU Innovation Action

Presenter : Prof. Yusuf Z. Menceloglu

Organization: Sabancı University, Türkiye

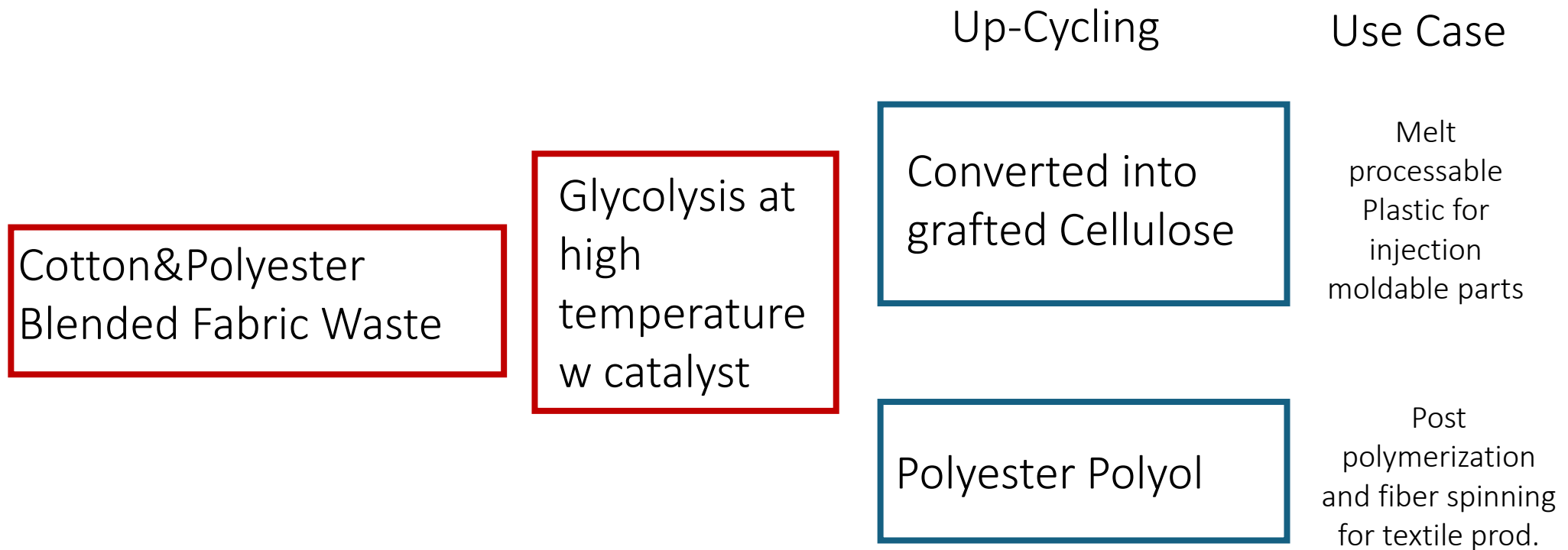
Objectives & Expected Results

- **TRL 6–7 demonstration** of a scalable **chemical recycling route** for **post-consumer polycotton textiles**.
- **Effective separation and valorisation** of blended fibres, enabling **fibre-to-fibre recycling of PET**.
- **Recovered cellulose converted** into **melt-processable biodegradable polymers** for **packaging films and rigid non-food packaging**.
- **Market-relevant industrial processing**, compatible with semi-continuous and continuous operation.
- **High-quality secondary materials** with reduced CO₂ emissions, fossil feedstock use, hazardous chemicals and microplastics.
- **Defined recyclability limits and cascading use pathways**, applying **Safe and Sustainable by Design (SSbD)** principles.



Sabancı University's Contribution as a Partner

- **Core technology provider** for chemical recycling of post-consumer polycotton textiles.
- **Lead development and scale-up** of fibre separation and cellulose graft polymerisation processes.
- **Material design & characterisation** of melt-processable, biodegradable polymers for packaging films and rigid products.
- **Industrial integration support**, ensuring compatibility with extrusion and injection moulding.
- **Contribution to SSbD, recyclability limits and cascading use logic**, in collaboration with LCA and industrial partners.



Upcycling of polycotton by mechanochemical method

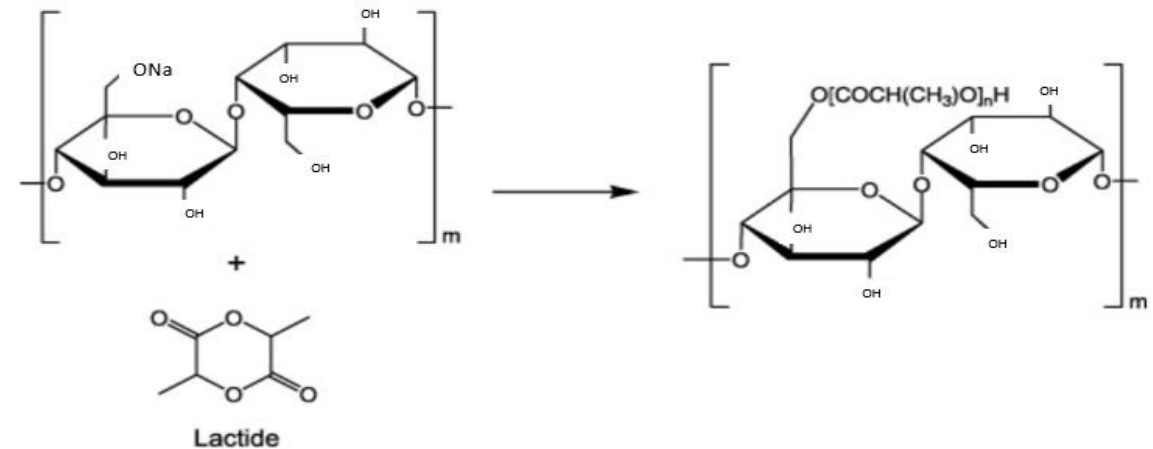
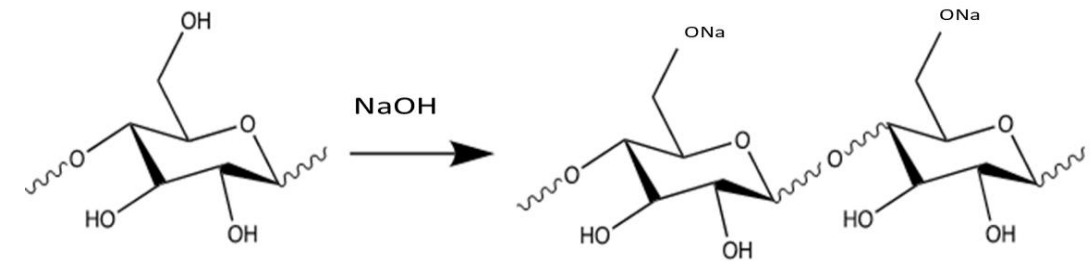
Glycolysis of Cotton & Polyester Blended Fabric Waste and separate cellulose and polyester polyol

Separated alkyl cellulose will be grafted by ring-opening polymerization of cyclic monomers to obtain melt processable biodegradable plastic

Separated polyol will be post polymerized for fiber spinning

Prepared biodegradable cellulose graft copolymers will be converted to single use packaging by melt process

Cellulose-g-poly(lactic acid) polymer synthesis



Partners Sought

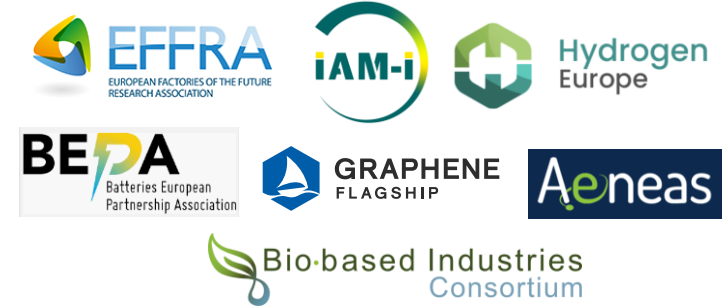
(as partners/coordinators)

Partner Type	Role
Textile Waste Collectors & Sorters	<ul style="list-style-type: none">• Post-consumer waste supply• Sorting & pre-processing• Feedstock characterisation
Chemical Recycling / Process Engineering Companies	<ul style="list-style-type: none">• Scale-up of glycolysis / separation• Reactor design• Continuous processing
Textile Fibre Producers / Spinners	<ul style="list-style-type: none">• Validate PET-derived fibres• Fibre-to-fibre demonstration• Textile performance testing
Plastics & Packaging Manufacturers (End-Users)	<ul style="list-style-type: none">• Injection moulding• Packaging validation• Market requirements• Certification input
Chemical Safety / PFAS Specialists	<ul style="list-style-type: none">• PFAS detection & removal• Regulatory compliance• Toxicological assessment
LCA / LCC / PEF Specialists	<ul style="list-style-type: none">• LCA/LCC• SSbD

Research Interests

- **Bio based/biodegradable composites**
 - Valorization of waste cellulose and xlinked rubber (tyres, gaskets etc.)
- **Chemical and Mechanical recycling of polymers**
- **Functional natural nanotubes for packaging and agriculture application**
 - Ethylene scavenger, Antimicrobial, Phase Changing materials, O₂ scavenger, odour scavengers
- **Bio Based additives**
 - Flame retardants and Plasticizers

Networks and Memberships



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