Unlocking the potential of chemical recycling: key learning on the way

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These forward-looking statements are subject to change based on known or unknown risks and various other factors, which could cause the actual results or performance to differ materially from the statements made herein.

Sulzer at a glance

Separation and purification at the heart of circular solutions

Flow Equipment

We keep your processes flowing

Wherever fluids are treated, pumped, or mixed, we deliver highly innovative and reliable solutions for the most demanding applications.

Services

Life-cycle solutions for a sustainable world

We are your partner for uptime and enhanced performance for your rotating equipment and more. Our dedicated people provide unrivalled service and expertise to meet your operational needs – anytime, anywhere.

Chemtech

We make chemistry happen

When superior chemical processing and separation technologies matter most, we enable our customers to operate world-class plants and produce high value products.

Sulzer’s purification technologies

Unlocking circularity across all advanced chemical recycling processes

Pyrolysis

- **Quenching & condensation** with optional separation of waxes
- **Hydrotreating** Liquid recycle MaxFlux® technology
- **Distillation** for product fractionation

Thermal Depolymerization

- **Quenching & condensation** with optional separation of oligomers
- **Distillation** for monomer purification
- **SuRe™ Styrene** for close / co-boiler and color removal with crystallization

Solvolysis

- **Distillation** for solvent recovery
- **Distillation** for monomer purification
- **Fractional crystallization** for polymer-grade monomers

Dissolution Recycling

- **DEVO** for polymer / solvent separation
- **Distillation** for solvent purification

The textile waste challenge

Massive volume, minimal recycling

113 mln tons
of materials were used to make textiles in 2021

92 mln tons
of textile waste end up being landfilled globally every year

134 mln tons
are expected by 2030

< 1%
of material in clothing is recycled back into clothing

10%
of global greenhouse emissions account for the fashion industry

20%
Wastewater worldwide from dyeing and finishing products → 2nd largest water polluter globally

16% - 35%
Of the total microplastics released into acquatic environment every year come from the fashion indusrty

50%
Projected emissions from the textile industry by 2030

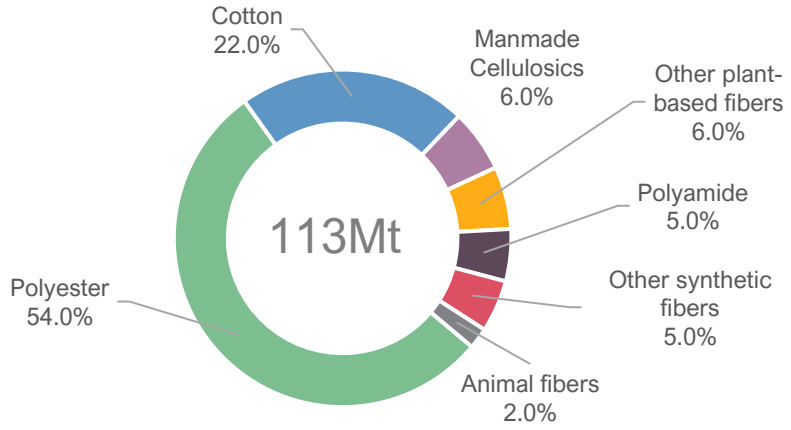
93 billion m^3
of water are required from the textile industry every year (2,700 liters for one single T-shirt)

500,000 tons
Of micorfibers from textiles are dumped into the ocean

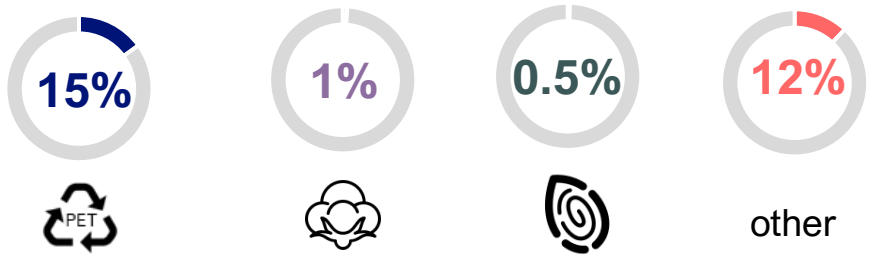
What makes Textile Recycling So Hard?

It’s not just plastic – it’s a chemical puzzle

Global fibers market distribution in 2021



Recycled content in fibers by type in 2021



Exploring the Complete Value Chain and Recycling Opportunities

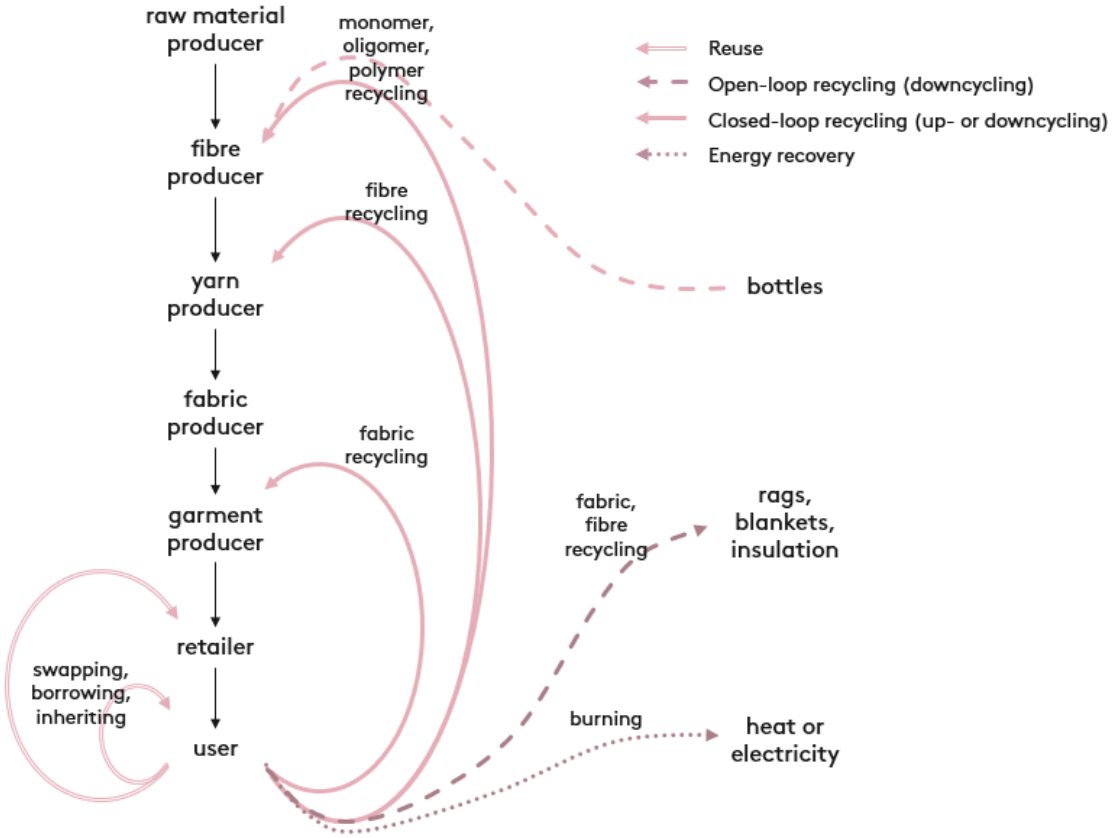
Open and Closed Loop Systems

Tetxiles Recycling

Textiles (Closed Loop)

Polymers (Open Loop)

Chemicals (Open Loop)



Chemical recycling depolymerizes complex textiles, enabling fiber-to-fiber potential

Main constraints and challenges

Competion with virgin materials which are cheap and available at scale

Most countries don’t have a dedicated system for sorting and collecting textiles

Research and scale up takes time

Policy gap. Ambitious EU targets meet uneven implementation at the local level.

Circularity in demand: driving forces in the textile industry

Extended Producer Responsibility (EPR) Schemes already implemented in France. Sweden and the Netherlands are launching EPR by 2025

Bans on the disposal of unsold products in place starting from 2024

Textile waste collection becomes mandatory in EU from 2025

Commitment by the Fashion Industry to replace **virgin polyester** with **recycled polyester** by 2025 (pledge to increase from 14% to 45% globally)

How to unlock the circularity gap: key enablers

Together we can close the loop on complex textile waste

Chemical recycling unlocks circularity in complex textile waste—especially for **blended and dyed fabrics** beyond the reach of mechanical recycling

Sulzer with its **purification technologies** and **in-house scale-up expertise,** enables chemical recycling by ensuring quality of recycled monomers and polymers

Collaboration across brands, recyclers, technology providers, and policymakers is essential to **scale circular textile solutions** and accelerate impact.

Lessons learned so far

No one-size-fits-all solution; technologies must be tailored for a specific feedstock

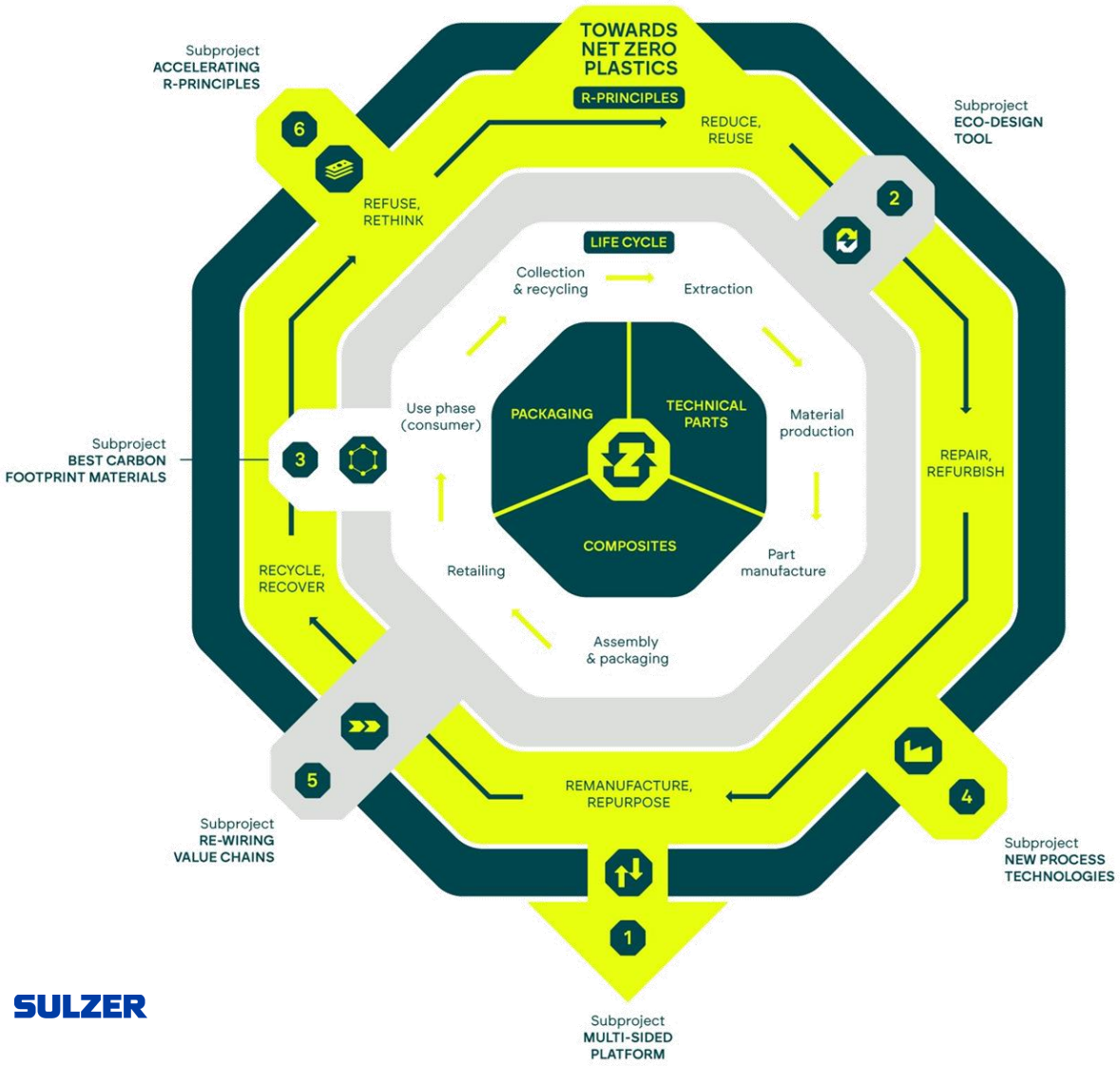
Chemical recycling has a role, but it is a part of a broader solution.

Purification is non-negotiable for high quality recycled outputs

Collaboration across the value chain is essential for success. Together, we can drive the transition towards a circular textile economy

SULZER

Transforming the Swiss Plastic Industry towards NetZero



- **Swiss consortium** driving net-zero innovation in plastic industry (8 Industry Partners, 5 Research Partners, 6 Focus topics)
- Building platform to connect **recyclers**, **industry**, and **researchers**
- **Six subprojects** targeting sustainable plastics innovation
- Supports textile recycling, especially synthetic fiber recovery

mythentec · MERAXIS · EPFL · SULZER · Composite Recycling (making GFRP recycling a reality) · VROLIN INFRATEC · medmix · Resilux (The power of PET) · ETH zürich

Thank you

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