



Opportunities and challenges in textile recycling

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We are Valmet

Valmet is a global technology leader in serving process industries. We work with our customers throughout the lifecycle, delivering cutting-edge technologies and services, as well as mission-critical automation and flow control solutions.

Backed by more than 225 years of industrial experience and a global team of 18,500 professionals close to customers; we are uniquely positioned to transform industries toward a regenerative tomorrow.

In 2025, Valmet's net sales totaled approximately EUR 5.2 billion. Our head office is in Espoo, Finland, and we have experts in approximately 40 countries around the world.

18,500

Experts in our global team

~40

Countries around the world

>120

Countries where our customers operate

Valmet's role in textile recycling

Solution provider

Technology & expertise

Leading references & partnerships

- **Circulose® Sundsvall**: main machinery from Valmet
- **Spinnova**: drying & heat recovery technology
- Collaboration: PESCO-UP, TexirC, Cimanet, TexTerials, PETcovery



Market drivers

Include economical & financial, regulatory & legislative, sustainability & environmental, technology advancement and consumer & brand related drivers



Economical drivers

Global textile consumption has accelerated, but demand is met with virgin fibers. Amount of textile waste will continue growing. There will be recycled fiber supply deficit.



Legislative drivers

Upcoming legislation will shift EU waste management towards circularity – mandatory collection from households, Extended producer Responsibility (EPR), Ecodesign, Waste Shipment...

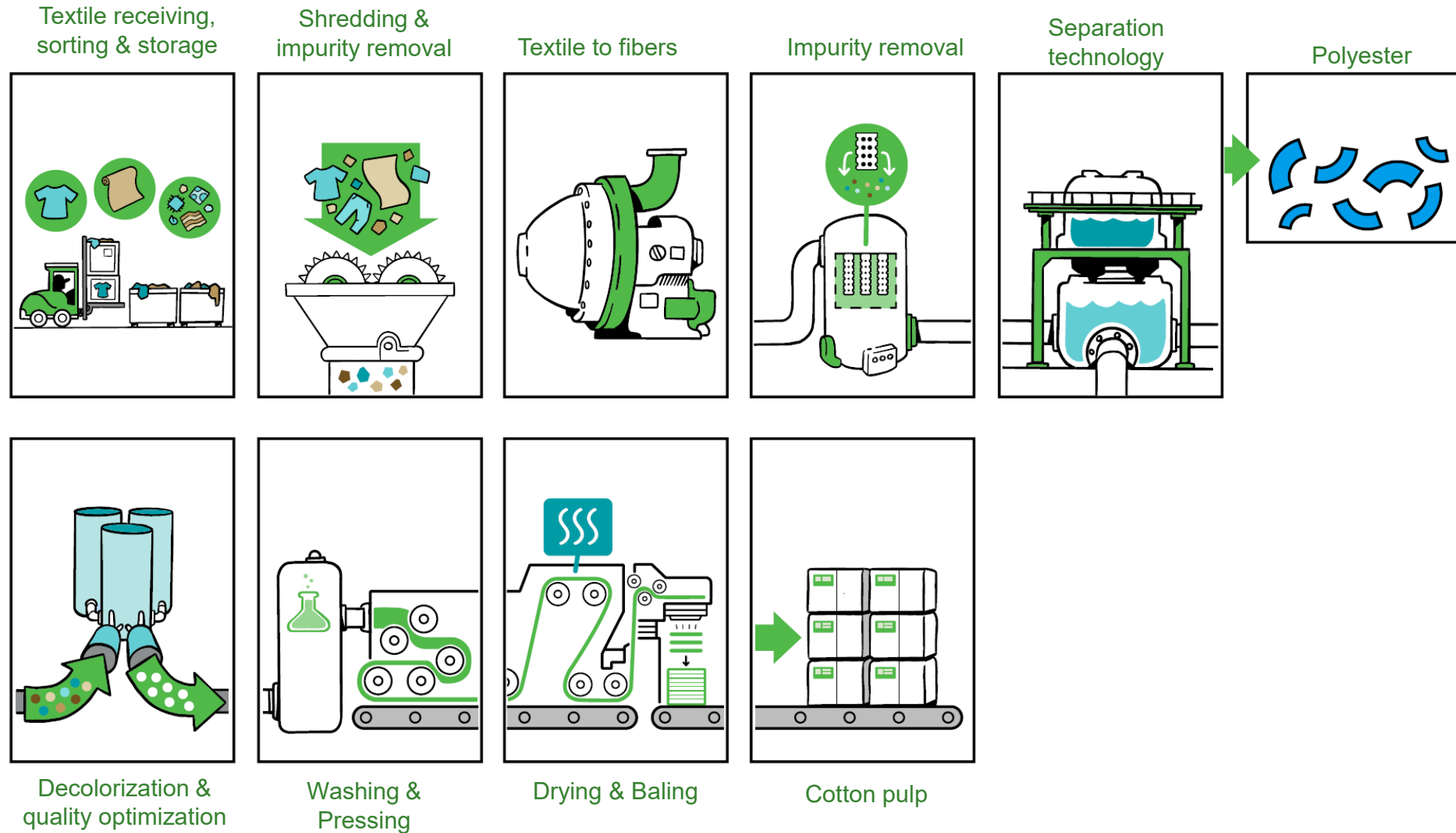


Sustainability and environmental drivers

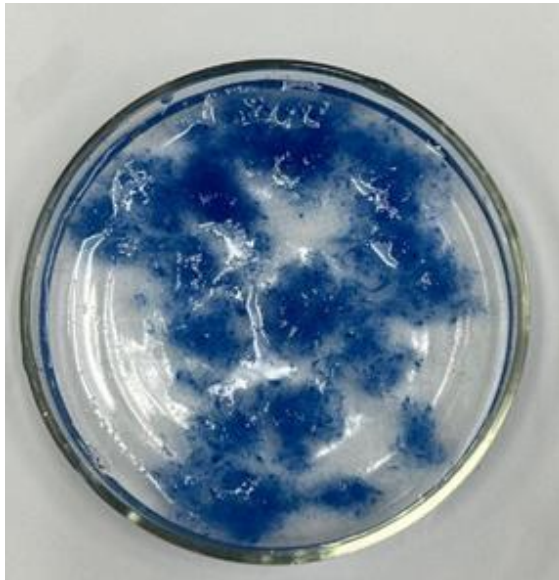
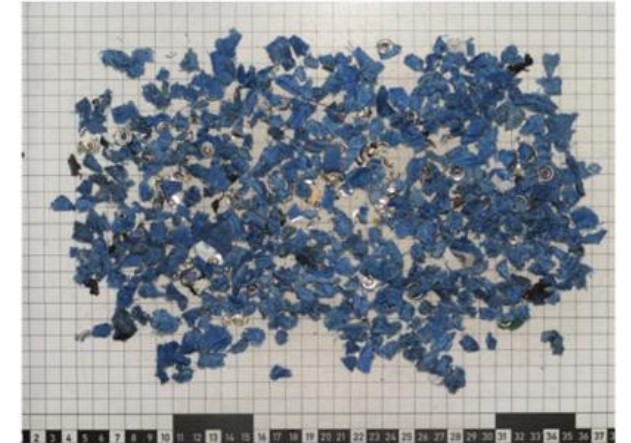
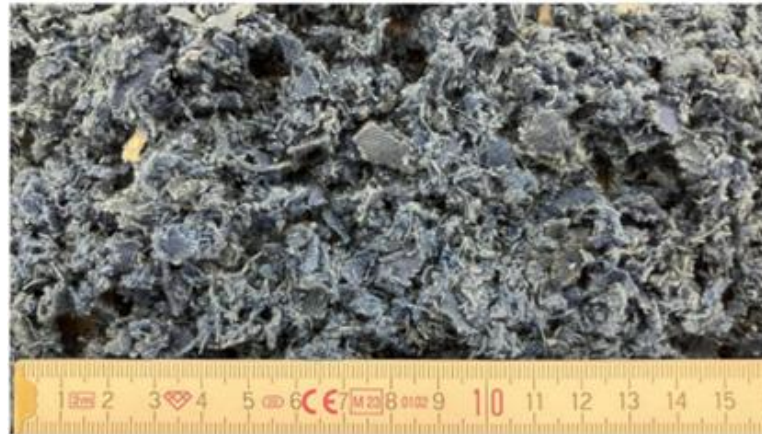
Significant changes in waste management in EU; landfilling to be phased out, incineration minimized. Fee on CO₂ emissions and carbon credits. Brand commitments to circularity & sustainability.

Valmet's approach to textile recycling processes

Simplified process example



Textile to fibers



Complexity of textile recycling

Material handling challenges



Waste textile characterization

- Finding suitable analyzing methods and standardizing them for textile materials



Safety and yield in textile processing

- Dust formation leading to safety issues
- Yield loss



Waste textile properties & processing

- The fiber length
- Rheological behavior



Complexity of textile recycling

Process integration and sequences



Process order in mills

- Order of equipment (or processes) in the mill



Bleaching techniques and requirements

- The bleaching challenges and sequences
- The final product quality



Our laboratory and pilot capabilities



Fiber Technology Center, Inkeroinen, Finland

- **Equipment for stock preparation**
 - Slushing
 - Deflaking
 - Dispersing
 - Refining
 - Screening
 - Various types of cleaners
- **Laboratory** with fiber analyser, microscope, rheology measurement, dirt count etc.



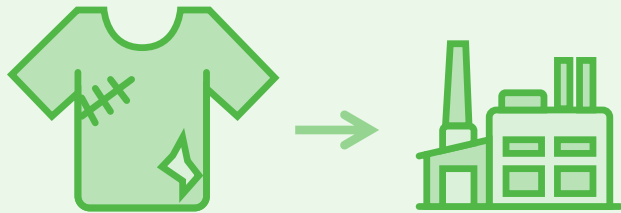
Fiber Technology Center, Sundsvall Sweden

- **Equipment for fiber treatment**
 - Bleaching / decolorization
 - High and low consistency refining
 - Screening
 - Washing and dewatering
 - Continuous steam explosion including chemical impregnation
 - Flash drying
 - Various reactors (mixed/stirred, pressurized, etc.)
- **Well equipped analysis laboratory**; Physical and chemical characterization of raw material, product and process liquors

Examples of Valmet's technologies utilized for textile industry



Circulose, Sweden



- Valmet scope of delivery

- Tearing and refining technologies
- Screening and cleaning technologies
- Chemical separation and color removal
- Drying and baling
- Measurement devices
- Installation, commissioning and start up
- Technical and scale-up R&D support



Spinnova, Finland

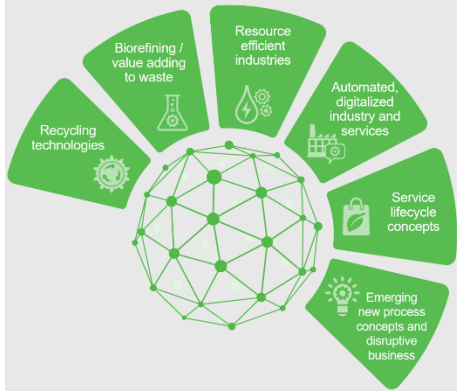


- Valmet scope of delivery

- Refining technologies
- Filament drying equipment
- Heat recovery technology
- Installation, commissioning and start up
- Technical and scale-up R&D support

Collaboration accelerating development and ecosystems

Valmet's Beyond Circularity programme, co-funded by Business Finland



R&D project PESCO-UP, funded by European Commission



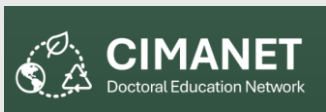
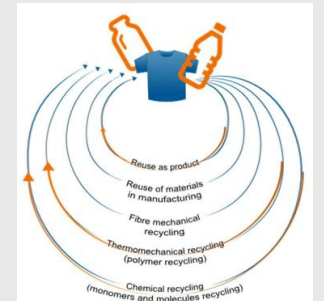
Co-Research project TexirC, co-funded by Business Finland



Co-Research project TexTerials, co-funded by Business Finland



Co-Research project PETcovery co-funded by Business Finland



CIMANET Doctoral Education Network – Doctoral Thesis collaboration with Aalto University

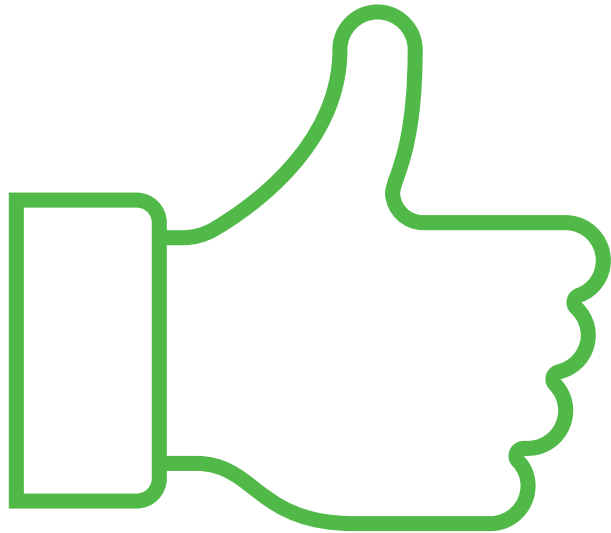
Opportunities & challenges

Positive market signs with financial,
legislative, environmental and brand-related
drivers

Scalable technologies exists

Available funding instruments

Business case



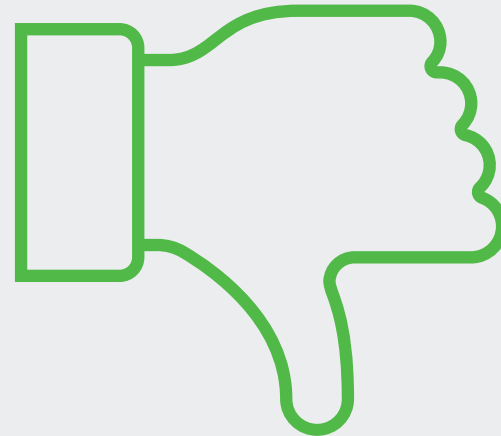
Remaining technical challenges

Organization and scaling of collection & sorting

Risk and financing of upscaling

Dilution, postponement, retargeting and
cancellation of legislation

Business case



Building strong partnerships together

Explore opportunities with Valmet

Proven technologies

- Decades of expertise in fiber treatment, project management and engineering
- Existing technologies usable for textile fiber solutions

Scaling up experience

- The whole journey from lab tests to full-scale production
- Experience on demonstrating new technologies at commercial scale
- Own facilities in Finland and Sweden

Reliable partner

- Global presence creates a good platform for growth
- Triangle approach of technology, automation and services
- Enhanced circularity and environmental efficiency

Let's build a feasible concept together!

