Approaches to enhance circularity in Cotton Value Chain

Policy perspective

Mumbai
03 December 2023
The global textile and clothing industry is characterized by 5 key trends

1. World textile consumption will continue to show long-term growth (2% p.a.) in tandem with demographics and GDP

2. Global textile industry is undergoing restructuring and consolidation leading to shifts in sourcing patterns

3. Sustainability and circularity have become imperative across the textile value chain

4. Digital technologies are impacting both the demand and supply of textiles

5. Leading to the emergence of ‘new business models’ and policy perspectives
World textile consumption will continue to show long-term growth (2% p.a.) in tandem with demographics and GDP.

Key trends

Source: UN Population data, ICAC, Gherzi analysis
Sustainability and circularity have become imperative across the textile value chain

### Key trends

- **Fibre producer**
  - Monomer, oligomer, polymer recycling
- **Yarn producer**
- **Fabric producer**
  - Fiber recycling
  - Fabric recycling
- **Garment producer**
  - Rags, blankets insulation
  - Fabric fibre recycling
- **Retailer**
  - Heat or electricity burning
- **User**
  - Swapping, borrowing, inheriting

**Open-loop recycling (downcycling)**

**Closed-loop recycling (up-or downcycling)**

**Reuse**

**Energy recovery**

Source: EU Commission, EEA
Sustainability and circularity have become imperative across the textile value chain (2/3)

**Key trends**

- 90% sustainable or recycled raw material (~2025)
- 97% of cotton organic, recycled or otherwise sustainably sourced (~2025)
- Collected volume of garments 25’000 to/a
- 100% of cotton from sustainable sources
- 50% of products with more sustainable fibers, including recycled/cellulosic (~2025)

Source: Company ESG Reports
Sustainability and circularity have become imperative across the textile value chain (3/3)

Key trends

- EU corporate sustainability due diligence directive
- EU Corporate sustainability reporting directive
- NY Fashion sustainability and Social accountability act
- EU forced labour regulation
- U.S. Uyghur forced labour prevention act
- EU Ecodesign for sustainable product regulation
- EU Packaging & packaging waste directive
- EU microplastics legislation
- UK Plastics packaging tax
- EU Textiles regulation
- EU Product environment footprint
- EU Textiles regulation
- EU Taxonomy

Source: Gherzi analysis
Key trends

....Leading to emergence of new business models and policy imperatives

Production
Produce clean, local, with respect and efficiently

11. 3D printers for garments
12. Digital printing and finishing
13. Short value chains
14. Automation in sewing process
15. Yarn performance
16. Innovative joining techniques
17. New technologies in the pipeline

Retail
Hack the take-away-waste model

18. E-commerce
19. New shopping experience
20. Take-back-waste model
21. New definition of ownership

Design
Design for eternity

7. Design to last
8. Design for rebirth
9. Smart textiles
10. Mass customization on the rise

Consumption
Go slow, connected, and take good care

22. Wise consumer
23. New rules for shopping (online mobile)
24. Importance of « Made in »
25. Increasing importance of activewear

Resources
Materials matter

1. Blends on the rise
2. Nonwoven innovation
3. Reuse and redesign waste
4. Precision farming
5. Filament era
6. The predominance of PES

Systems thinking
Be transparent and work together

28. Smart textile manufacturing systems
29. CSR is a must
30. Transparency
31. Traceability
32. Data integration
33. Norms and standards

End of life
Consider every ending as a new beginning

26. Biodegrade organic textile
27. Upcycle, reuse and recycle

Regulation

34. Legislation by EU, US, UK
35. EPR
**TVC 2025: World – Textile material flow in the added value chain [mn t]**

**Fiber consumption**
- Filament
  - 62.5 mn t
  - Polyester (51.7)
  - Polyamide (5.3)
  - Polypropylene (3.2)
  - Viscose (0.4)
  - Silk (0.2)
  - Spandex (1.2)
  - Aramide (0.1)
  - Carbon (0.1)
- Short staple
  - 54.4.0 mn t
  - Polyester (20.0)
  - Polyamide (0.2)
  - Polypropylene (1.1)
  - Viscose (7.4)
  - Cotton (25.0)
  - Acetate (0.0)
- Long staple
  - 8.3 mn t
  - Wool (0.9)
  - Acrylic (1.9)
  - Bast (flax, jute, coir, ramie, hemp (5.5)

**Yarn / Filament**
- Filament (+tapes) 65.50 mn t
  - Short staple spinning 39.2 mn t
    - OE (7.6 mn rotors): 8.6 m t
    - Ring (219 mn spindles): 26.8 mn t
    - Air Jet (0.95 mn spindles): 3.7 mn t
  - Long staple spinning 7.7 mn t

**Textile surfaces**
- Traditional Tex. Hometex & Garments (Woven, Knits, Raschel): 81.4 mn t
- Trad. Tech. Tex. (Woven, Knits, Braided): 24.3 mn t
- Nonwoven 23.0 mn t
- Prepreg - Composites 7.1 mn t
  - ~5% waste

**Finishing & garmenting**
- Garments 52.7 mn t
- Hometex 22 mn t
- Non-woven 21.9 mn t

**Retail**
- Garments 1'513 bn $
- Hometex 311 bn $
- Tech. Tex. 234 bn $ (roll goods)
  - out of which:
    - Composites ~43 bn $
    - Nonwoven ~48 bn $

**Source:** Gherzi estimates
**Textile recycling**: Yarn and fabric waste generated during manufacturing process pass through various processes before reaching the recycler in the textile value chain *(1/2)*

Source: Gherzi Research
**Textile recycling:** Yarn and fabric waste generated during manufacturing process pass through various processes before reaching the recycler in the textile value chain (2/2)
**Textile recycling**: Out of 4 recycling technologies, mechanical and thermo-mechanical textile recycling are the most developed so far.

1. **Mechanical**
   - Recycling the textile waste back into fibers
   - No use of any chemicals or heat in the process

2. **Thermo-mechanical**
   - Recycling the textile waste back into fibers / filament
   - No use of any chemicals

3. **Chemical**
   - Recycling the textile waste back into fibers / filament
   - Recovers monomers from waste fibers by polymer decomposition

4. **Thermo-chemical**
   - Recycling the textile waste and convert it to Syngas
   - It is a carbon-based gasification process of biomass

*Sources: Euratex*
Several policy interventions are needed to valorize the textile waste and boost circularity (1/3)

- Consolidation of the fragmented textile value chain (long-term)
- Technology upgradation
- Fiscal incentives
- Standards and traceability
- Collaboration among all stakeholders (PPP)
Several policy interventions are needed to valorize the textile waste and boost circularity (2/3)

Household textile waste collection system in Switzerland

Source: Gherzi
Several policy interventions are needed to valorize the textile waste and boost circularity (3/3)

ReHubs Europe is the industry’s response to the upcoming EU legislation, which sets compulsory collection and sorting of textile waste, by 2025:

- **Step 1**: Supply chain mapping was carried out. It estimated the total textile waste at 7.5 mn tons

  - **Step 2**: Techno Economic Master Study (TES) was conducted by EURATEX’s ReHubs initiative. It plans to pursue fiber-to-fiber recycling for 2.5 millions of textile waste by 2030. This would require a CAPEX of € 7 bn to be financed as public-private basis

- **Step 3**: This new circular value chain would require significant capacity with 150-250 facilities to be set up all over Europe

- **Step 4**: ReHubs Europe will gather key players from the textile value chain – textile manufacturers, fashion brands, collectors and recyclers, chemical industry, technology providers. Euratex being the apex agency

  - **Step 5**: “Transform Waste into Feedstock” announced as first project supported by the ReHubs, and aiming at building up a first 50,000 tons capacity facility by 2024(Texaid)
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# Gherzi: Integrated consulting since 1929

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Gherzi: International presence

- ca. 140 fully employed professionals
- Partnership on a worldwide level
- 6 own HQ offices
- More than 8’000 completed projects
- Activities in more than 80 countries
Gherzi: Instrumental in global initiatives on sustainability and circularity

Gherzi is a founding member of ReHubs