Current State of Textile Recycling

UNIDO Circular Economy Conference

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The textile industry follows a linear model

- Lifecycle ends at the consumer end of use stage
- Currently textiles are collected in developed countries for exported to emerging and developing countries for re-use as second hand clothing
- Recycling is limited mainly to downcycling like the production of wipers for industrial use and shredding materials
- Only very limited high value open or closed loop recycling processes, e.g. for cashmere and wool products are economically viable
- Professional collection needs to be financed by re-use “2nd-hand” fraction. No contribution by industry or municipalities/states (except France)
- Policy should be implemented to encourage collection, sorting and recycling
While supply of new textiles increases faster than world GDP

- Sales of textiles have nearly doubled over the last 15 years (in USD)
- Utilisation has decreased by 1/3
- More than 75% of textiles go to landfill or incineration after first or second use

Current State of Textile Recycling

Having a substantial impact on the environment and high social cost

- 27'000 l of water consumed in the production of 1 kg cotton
- Around 25% of insecticides and 10% pesticides utilized in textile industry
- High pollution of rivers due to chemical discharge of sewage (e.g. from dying processes) without purification
- Labour conditions in the manufacturing site is still difficult; discussion on minimum living wages in developing countries
Less than 1% of collected textiles are recycled in a closed loop system

- Around 65% of textiles collected by TEXAID in Germany and Switzerland are reused as 2nd hand textile
- Only around 1% can be reused in an open-/ closed loop scenario
Main problem for recyclability is the large variety of materials used

- Materials used in textile production are very heterogenous
- Increasing mixed fibres on garments (e.g. polyester and cotton, cotton and elastane, wool and acryl)
- Accurate material composition needed in garment labels in standardized way. Problem: Garments often received with label removed by consumer
- Extensive number of trims added, such as buttons, zips etc.
- Use of chemicals in production process unspecified
Technologies not yet mature enough for large scale high value recycling

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<th>Mechanical Recycling</th>
<th>Chemical Recycling</th>
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<tr>
<td><strong>Methods</strong></td>
<td>Shredding of material to regain fibre</td>
<td>Dissolving of fabric with use of agent chemicals</td>
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<td>Spinning of fibre to produce fabric</td>
<td>Extrusion method to create fibre</td>
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<td><strong>Strengths</strong></td>
<td>Blends can be processed in mechanical fibre recycling</td>
<td>Return fibres to virgin quality</td>
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<td><strong>Weaknesses</strong></td>
<td>Often results in inferior quality in comparison to virgin</td>
<td>Not yet technologically or economically mature</td>
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Demands on policy makers and industry

- Mandatory separate collection of used textiles as required in current draft of EU Waste Framework Directive -> needs to be financed
- Exemption of recycled raw materials from REACH and comparable legislation
- Increased use of recycled raw materials by textile industry
- Funding and support for R&D in textile recycling and the development of new business models
- Reduction of non-tariff trade barriers for the export/import of used textiles and recycled raw materials
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