We make fashion sustainable

Used textiles: waste or value?
Tallinn, 12 December 2018
Holiday guilt? Sweden’s most popular gift will make it even worse

[Photo: courtesy of HUI Research]
Business leaders are putting sustainability at the core.

Trendsetters and consumers demand sustainability.

+47% increase in searches for "sustainable fashion" on Lyst in 2018.

88% think it is important that fashion brands tackle environmental protection.

Politicians are taking a closer look at waste.

Fashion for Climate Action Charter
WE JOINED

China’s trash ban lifts lid on global recycling woes but also offers opportunity.

1: Fashion Revolution Consumer Survey 2018
Leading brands commit to circular materials

Circular Fashion System Commitment

<table>
<thead>
<tr>
<th>94</th>
<th>SIGNATORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>206</td>
<td>TARGETS SET</td>
</tr>
</tbody>
</table>

Examples

"Each year from 2018 - 2020 we will publish external targets for increasing postconsumer recycled textile materials in our products whilst eradicating those that cannot be cycled. We will report on our progress and continue this initiative past 2020."

"By 2020, we will have identified the most promising recycling technologies for postconsumer materials across multiple product categories, and will start scaling them up in our supply chain."

"By 2030 we will use only recycled or other sustainably sourced materials"

"At Inditex, we want to close the loop and move towards a circular economy – developing a complete and efficient life cycle for our products, in which nothing goes to waste."

"By 2020, we will have identified the most promising pre and post consumer raw material recycling technologies for luxury and will start scaling them up in the supply chain."

https://www.globalfashionagenda.com/commitment
3 out 5 garments are discarded within a year

>97% virgin feedstock
PLASTIC (63%)
COTTON (26%)
OTHER (11%)

53 million tonnes
ANNUAL FIBRE PRODUCTION FOR CLOTHING

USE

73% landfilled or incinerated

2% losses during collection and processing

<1% closed-loop recycling

12% cascaded recycling

2% recycled feedstock from other industries

12% losses in production

0.5 million tonnes microfibre leakage

Source: Ellen MacArthur Foundation – Circular Fibres Initiative
<1%
Something is missing...
We close the loop

- Waste collector
- Fiber producer
- Consumer
- Yarn spinner
- Fashion brand
- Fabric producer
1. We receive textiles with high cellulosic content (cotton and viscose).

2. The textiles are shredded, de–buttoned, de–zipped, de–colored and turned into a slurry.

3. Contaminants and other non–cellulosic content are separated from the slurry.

4. The slurry is dried to produce a pure, natural re:newcell pulp, which is packaged into bales and fed into the textile production cycle.
Our Kristinehamn plant

- 7,000 metric tons
- 25 employees
- Research & development
re:newcell Pulp

- Circular (textile to textile recycling)
- Biodegradeable (pure cellulose)
- High quality (top fiber properties)
- Scalable (first plant built)
Upcycling can improve fiber quality

Fiber made from re:newcell pulp performs better than lyocell in several dimensions.

### Staple fiber properties

<table>
<thead>
<tr>
<th></th>
<th>re:newcell pulp</th>
<th>Birch/ re:newcell mix</th>
<th>Lyocell market leader reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fineness [d tex]</td>
<td>1,65</td>
<td>1,65</td>
<td>1,32</td>
</tr>
<tr>
<td>Tenacity, dry [cN/tex]</td>
<td>46,9</td>
<td>54,7</td>
<td>39,9</td>
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<tr>
<td>Elong at break [%]</td>
<td>11,3</td>
<td>13,4</td>
<td>13,4</td>
</tr>
<tr>
<td>E-modulus [N/tex]</td>
<td>8,3</td>
<td>10,6</td>
<td>7,0</td>
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[https://doi.org/10.1177/0040517517723021](https://doi.org/10.1177/0040517517723021)
...and reverse the climate damage

Fibers made from re:newcell pulp have a substantial **positive** net global climate change impact.

The chart shows net global climate change impact in ten different fiber production scenarios.

**Source:** SCS Global Services Report

"Life Cycle Assessment Comparing Ten Sources of Manmade Cellulose Fiber"
Generic sourcing landscape
Different forms of cooperation

Forms of cooperation
1. Closed loop partnership
2. Open loop partnership
3. Recycling partnership

1. Closed loop partnership
Customer tailored loop where the fashion brand has a take back program and can supply pre- and/or post-consumer cotton textile waste. Re:newcell upcycles the textile material into dissolving pulp, which can be turned into fibers through selected fiber spinners. These fibers are then supplied to yarn, textile and clothes manufacturers through the brand’s preferred value chain. Re:newcell supplies the brand with relevant LCA or footprint data, which can be used for internal and external purposes. A truly circular approach.

2. Open loop partnership
A circular approach where the fashion brand relies on textile waste coming from re:newcell’s other qualified sources. Re:newcell upcycles the textile waste into dissolving pulp, which can be turned fibers through fiber spinners. These fibers are then supplied to yarn, textile and clothes manufacturers through the brand’s preferred value chain. Re:newcell supplies the brand with relevant LCA or footprint data, which can be used for internal and external purposes. Creating a circular collection.

3. Recycling partnership
Re:newcell offers a premium upcycling solution with outstanding sustainability credentials. Pre and/or post-consumer cotton textile waste can be sent to re:newcell, who then upcycles the textile material into dissolving pulp with a low impact environmental footprint. The supplier of the incoming waste receives relevant credentials and certificates, which can be used for internal and external purposes. Creating a circular flow.
A Northern European loop for circular fashion?
Challenge: Consistency

The supply of waste is heterogeneous by definition, while fiber producers value consistency above everything else.
Challenge: Finance

In Europe, investment in scaling is not as available as in the US or China. Building and scaling this kind of innovation is capital intensive and requires a long financial runway.
Challenge: Volume

With a small production capacity, fiber spinners can be hesitant to accept a novel feedstock into large production lines.

Fiber spinner demand

Kristinehamn plant capacity
Can we have your jeans, please?

Initially we prefer to recycle cotton, especially denim jeans. They are:

- Easy to sort *(everyone can spot a pair of blue jeans).*
- They usually are close to 100% cotton.

re:newcell
Recycling clothes finally works.