Fashion Revolution Exhibition display guide

Unit number on each print.
The Swedish fashion industry is in a development phase in which a transition to more sustainable and circular business models is as natural as it is necessary. It's an exciting time, when research, innovation and cross-disciplinary collaborations are paving the way for a fashion industry that can set an example for the rest of the world. Fashion revolution is about the challenges – but also about the possibilities – that are changing the fashion industry to help save our environment.

A CIRCULAR ECONOMY

The fashion industry is dominated by a linear structure that is sometimes described with the words ‘take, make, dispose’. A linear business model entails a huge waste of limited resources and is unattainable from an economic, human and environmental perspective.

It's important to transition to a circular economy, in which every link in the value chain is connected in a closed-loop cycle, and the added value is preserved for as long as possible, while the amount of waste is reduced.

Several examples show we are already well on the way. The Swedish research group Swerea IVF helps companies create circular models and measures the resulting quality and financial advantages.

Re:textile also deals with research and innovation with the aim of creating a circular textile industry. In 2017 Re:textile launched, in collaboration with fashion company Lindex, the pilot project Re:design – a collection of upcycled products developed in Borås, Sweden.

In Houdini Sportswear’s range about 50 per cent of the products have a circular life cycle, while 35 per cent of the range consists of recycled or renewable fibres that are either entirely recyclable or biodegradable.

Fashion Revolution Exhibition module 1
‘Circular economy’

CLOTHES FOR A SUSTAINABLE FUTURE

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**Fashion Revolution** Exhibition module 1
‘Circular economy’
Fast production of trendy clothing sold at low prices led to the expression ‘fast fashion’. The trend started sometime in the 1950s, when chains such as Swedish H&M were established. The phenomenon, which is based on a linear business model, is traditionally about quick sales and rapidly shifting trends, without necessarily giving or consideration to whether the garments will last or can be recycled.

Among leading actors in fast fashion in Sweden, such as H&M, Lindex and Kappahl, sustainability is nowadays high on the agenda. An important shift in attitude can be discerned, with companies viewing sustainability as a financial opportunity instead of an obligation.

To make fast fashion more sustainable, in Sweden emphasis is placed on the need for new technology and innovation. Mistra Future Fashion is a cross-disciplinary research programme with the vision of introducing new ways of thinking.

One of its projects, Circular Design Speeds, focuses particularly on the speed of fashion. The central idea is that we use different materials depending on the garments’ projected lifespan. In the future, ‘fast’ fashion may come to be even faster – made from biodegradable materials such as fibres from forests – whereas its antithesis, ‘slow fashion’, is designed to be used for as long as possible.

In collaboration with the Filippa K brand, the project is developing 100 per cent circular fashion garments, and the most important insights gained are shared with the industry.

**Physical objects:**
Filippa K sweater stone and sweater

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**FAST FASHION**

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**Physical objects:**
Filippa K sweater stone and sweater
Fashion Revolution Exhibition module 2
‘Fast fashion’
A garment’s lifespan makes a great difference to its environmental impact. In Sweden, we buy on average 50 new garments per person per year, and almost one third of that is never used.

If a garment were to be used three times longer, its climate impact would shrink by 65 per cent. Reusing a garment three times increases its effectiveness by 300 per cent. Choosing second-hand removes a full 70 per cent of a garment’s climate impact.

A garment’s technical lifespan, however, is determined long before it reaches the store. Over half of a garment’s total environmental impact is determined in the design phase. There is potential to make a great difference right at the design stage in the selection of material and suppliers.

For Swedish brands such as Filippa K and Gudrun Sjödén, product life is a key concept in their sustainability work. Since 2014, Filippa K has operated by the motto “sustainability leads the way to growth”. The so-called Front Runners – garments developed in accordance with 12 criteria, such as sustainable materials, transparent supplier chain, reusability and minimal emissions – lead the way for the rest of the brand’s collections.

The company also provides mending and rental, as well as the sale of second-hand Filippa K garments – all in an effort to give the garments as long a life as possible.

Filippa K dress

Physical object: Filippa K dress
**Fashion Revolution** Exhibition module 3
‘Lifespan’

**ALTERNATIVE 1**
The portraits are printed on transparent acrylic sheets and mounted on opposite sides of the module.
**Fashion Revolution** Exhibition module 3
‘Lifespan’

**Top view**

**ALTERNATIVE 2**
The portraits are printed on same material (e.g. Forex board) as rest of prints.
Clothes are traditionally made from natural fibres, synthetic fibres or a blend of the two. Natural fibres are often assumed to be more environmentally friendly since they are renewable and biodegradable, but the reality is more complicated. For example, the cultivation of natural fibres may require huge amounts of water, chemicals and energy.

According to the Higg Materials Sustainability Index (MSI), leather and natural fibres such as silk, cotton and wool have the greatest environmental impact in the short term – on the other hand, they are often durable, which evens out the aggregate climate impact if we look at the garments’ total lifespan.

Synthetic fibres, a type of plastic that is usually extracted from fossil oil, give rise to extensive carbon dioxide emissions during incineration, and are broken down extremely slowly in nature. Tophase out the use of fossil materials, active efforts are under way to develop and produce better alternatives – such as the cellulose-based material Lyocell.

The innovation project "Establishing locally cultivated textile in Sweden" (ENTIS) aims to re-establish and strengthen the Swedish textile industry by investigating how sustainable, biobased textile production can be facilitated by textile fibres from forest raw material or recycled biobased textiles. Sixty actors from different industries participate in the project, which was initiated by BioInnovation, a programme to develop innovative materials, products and services based on renewable raw materials.

The Swedish Tierra brand has developed a jacket entirely free of fossil sources. The Deterra® is made of 100 per cent biobased material from sources such as beans, corn and nuts.

Physical object:
Tierra Deterra jacket

Physical object:
Textile sample

The Fashion Revolution Exhibition module 4 ‘Fibres’
Fashion Revolution Exhibition module 4
‘Fibres’
COTTON

Cotton is the most commonly used material in the Swedish fashion industry. Cotton farming is one of the world’s most chemical-intensive forms of agriculture, which contributes to the degradation of soils, decreased biodiversity, and a variety of health issues. As the earth’s population grows, so do the demands on agricultural production to feed everyone, and the dilemma arises whether to produce cotton or food. Finding alternative fibres to conventional cotton is one of the fashion industry’s most urgent challenges and it requires efforts on many levels. The aim should be no less than to transition to cotton that is organic and certified in accordance with both environmental and social requirements, such as GOTS (Global Organic Textile Standard) – and to develop alternatives to cotton.

Organic cotton is increasingly common in Swedish brands. In 2017 Velour launched the world’s first jeans certified by the Nordic Svanen ecolabel. Since 2012, all Nudie Jeans are denim products made from 100 per cent organic cotton. Many Swedish brands, such as Lindex, Uniforms for the Dedicated, Mini Rodini and Boob, sell GOTS-certified clothing. The New Wave Group sells clothing, such as promotional apparel, that is both Svanen-labelled and GOTS-certified. H&M has set a target that by 2020 all cotton used in its products must come from sustainable sources: organic, recycled or from Better Cotton Initiative (BCI).
Fashion Revolution Exhibition module 5
‘Cotton’
Both fibre cultivation and dyeing require large quantities of water and chemicals. In some cases, up to 10,000–30,000 litres of water, to produce one kilogram of fabric.

Waste treatment plants are often unable to fully treat the waste water emanating from textile production processes. The pollutants released into watercourses from both textile production processes and the final washing of garments are rarely purified before the water is released into the environment. Traditional cotton farming involves insecticides, and the dyeing process is equally problematic. Even when the cotton is organic, the garment may still be dyed with carcinogenic colouring agents. Usually the dyeing is done in large factories, where the polluted water has to be treated before being released into watercourses. In an attempt to phase out hazardous chemicals in its textile industry, the Swedish textile industry took action at an early stage and requires that their suppliers purify their water emissions near to textile plants.

Many Swedish companies choose to use a special version, the Re-Kånken, made from a single thread from eleven recycled plastic bottles. It is dyed using a special technology that reduces both water, energy and chemicals.

The classic Fjällräven knapsack has been produced in a special version, the Re-Kånken, made from a single thread from eleven recycled plastic bottles. It is dyed using a special technology that reduces both water, energy and chemicals.

Physical objects: Fjällräven Re:Kånken and We aReSpinDye pellets and textile/thread samples

**WATER AND CHEMICALS**

Both fibre cultivation and dyeing require large quantities of water and chemicals.

**FACTS**

**AREAS OF PHYSICAL AND ECONOMIC WATER SCARCITY**

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Magnitude of Impact</th>
<th>Biggest Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>High</td>
<td>Amount and frequency of fertiliser and pesticide use.</td>
</tr>
<tr>
<td>Energy</td>
<td>High</td>
<td>Share of renewable energy use.</td>
</tr>
<tr>
<td>Chemicals</td>
<td>High</td>
<td>Using recycled plastics/fibres.</td>
</tr>
<tr>
<td>Waste</td>
<td>Medium</td>
<td>Waste of fibres/fabrics.</td>
</tr>
<tr>
<td>Labour</td>
<td>Medium</td>
<td>Low level of wages.</td>
</tr>
<tr>
<td>Health &amp; safety</td>
<td>Medium</td>
<td>Prevalence of corruption.</td>
</tr>
<tr>
<td>Community</td>
<td>Very high</td>
<td>Building safety.</td>
</tr>
<tr>
<td>Environment</td>
<td>Very high</td>
<td>Chemical exposure of workers.</td>
</tr>
</tbody>
</table>

**EXHIBITION MODULE 6**

Fashion Revolution

‘Water and chemicals’

**6:1. 70x70 cm**

**6:2. 70x70 cm**

**6:3. 70x70 cm**

**Source:** Pulse of the Fashion Industry 2017

**International Water Management Institute**

Source: A Comprehensive Assessment of Water Management in Agriculture
Fashion Revolution Exhibition module 6
‘Water and chemicals’
**MICROPLASTICS**

Polyester is currently the most common raw material for textiles on a global level. Just like the other synthetic fibres, the oil-based polyester represents a huge environmental challenge. All fabric-dyes, and synthetic fibres will cause microplastics when they are washed. Polyester will create such microfibres, which only stop the larger particles, not the micro-fibres.

The worldwide goals defined in the UN’s 2030 sustainable development agenda refer to a zero vision. Currently, however, the textile and fashion industry is estimated to contribute 11 per cent of the world’s carbon dioxide emissions, and microplastics shedding. The project has concluded that this is a vulgarity which should be discussed in all aspects and the microplastics should be removed in the production phase.

Therefore, we must act such as for research programme Mistra Future Fashion, which in collaboration with Swedish brands H&M, Filippa K and Stina Design, and researchers from Borregaard HØF, has conducted a research study to analyse the emissions of microplastics in the textile and fashion industry and microplastic shedding. The project has concluded that this is a vulgarity which should be taken seriously and that microplastics should be removed in the production phase.

**TRANSPARENCY**

COOPERATION AND TRANSPARENCY

Transparency is a key concept in the textile and fashion industry. Distinct different industry actors’ sustainability work and the need for comparability and reliability of sustainability data are essential driving forces for change in the industry. Transparency is a key concept in the textile and fashion industry. Information on products and production processes can create a unified sustainability reference point.

**ENERGY AND TRANSPORT**

Energy consumption in the textile industry is high and is at present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle. Polyester, for example, demands an enormous energy input during its production, whereas with cotton, the energy consumption is low and is present at every stage of a garment’s lifecycle.

**GUPPYFRIEND washing bag**

Physical object: GUPPYFRIEND washing bag

**Sources of marine microplastics and biological processes affecting microplastics in the marine environment**

**Physical processes**

- Wave action
- UV
- Degration to smaller particles
- Chemicals in sediments; low bioavailability
- Saturation of surface area to absorb pollutants
- Re-suspension
- Floating plastics

**Plant and animal processes**

- Ingestion of plastics; bioaccumulation of pollutants taken up
- Food chain transfer, leaching of additives
- Ingested macroplastics >5mm input via rivers
- Chemical additives

**Chemicals**

- Input via wind
- Chemical polluted water
- Re-suspended microplastics
- Chemical dissolved in water
- Chemical input via rivers

**Macroplastics >5mm**

- Input via ships
- Chemical pollutants
- Re-suspended microplastics
- Chemical input via rivers

**Microplastics in the Marine Environment: Current Status, Assessment Methodologies, Impacts and Solutions.**


PHOTO: Simon Paulin/imagebank.sweden.se

PHOTO: Filippa K

PHOTO: GUPPYFRIEND washing bag

PHOTO: Houdini Sportswear
Fashion Revolution Exhibition module 7
‘Microplastics’ + ‘Energy and transport’ + ‘Cooperation and transparency’
TEXTILE RECYCLING

Globally, we consume about 62 million tonnes of clothing per year, and only 20 per cent is re-used or recycled. The fast fashion industry has emerged as a major source of waste, contributing to waste management voids and ongoing challenges of proper resource management and environmental problems.

Recycling of textiles is currently divided into mechanical and chemical processes. Mechanical recycling on large-scale materials has presented a great challenge.

Regarding chemical recycling of cotton, currently most of the activity takes place on the laboratory level. On the other hand, mechanical recycling of polyester is taking place full-scale in Asia and is expected to be scaled up globally in the coming years.

In Sweden, a great deal of research is being done on textile recycling. In 2017, Mistra Future Fashion presented the results of a six-year research project called Blend Re:wind that has developed a process for chemical recycling of cotton and polyester fibre blends.

The Re:Mix project, initiated in 2016, aims to develop the technical methods required to separate nylon and elastane out of fibre blends in used textiles.

In 2017, the Lindex clothing chain launched its Re:Design collection of upcycled garments developed in collaboration with Re:textile at the University of Borås, Sweden. The kimono seen here is made from Lindex Better Denim garments from previous seasons, which have been redesigned in Borås.

SUSTAINABLE CONSUMPTION

As consumers we play a major role in facilitating a circular fashion economy. We increasingly call for more sustainable fashion and more transparency in the value chain. The better informed we are, the greater the pressure we can exert on companies to act sustainably.

Let your garments live a long life

The single best thing you can do for the environment is to wear your clothes for longer periods, or make sure someone else will wear them. The garment life can be prolonged in various ways: wear your clothes with different styles, iron instead of dry cleaning, and mend instead of replacing. The better informed we are, the greater the pressure we can exert on companies to act sustainably.

Choose natural fibres

Natural fibres are biodegradable and can be composted. They do not require water or energy intensive production, and most are grown in a sustainable way. Natural fibres such as cotton, wool, and silk are better for the environment than synthetic fibres.

Guidelines for recycling

Choose garments that are certified in accordance with established ecolabelling, such as Global Organic Textile Standard (GOTS), EU Ecolabel and Fairtrade – preferably brands that meet standards of both environmental and social responsibility. Ask the brands how and from which materials their garments are made.

Physical object:
Lindex RE:DESIGN kimono
Fashion Revolution Exhibition module 8
‘Textile recycling’ + ‘Sustainable consumption’
**Fashion Revolution** Exhibition modules

This is a slight modification of Type C mounting of prints (see page 16 in the Module manual) where prints are attached to a recessed cross barrier with double-sided tape, Velcro tape or nails onto the barrier.

The total measurement of the crossbarrier and the board should be less than the thickness of the studs so that the prints are recessed between the vertical studs.

For acrylic prints see Type A (page 12 in the Module manual).