



Nordic Council
of Ministers

TEXTILE-TO-TEXTILE RECYCLING

Ten Nordic brands
that are leading the way



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David Watson and Anja Charlotte Gylling (PlanMiljø), Tova Andersson and Maria Elander (IVL) and Pirjo Heikkilä (VTT)

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Nordens Hus

Ved Stranden 18

DK-1061 Copenhagen K

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TEXTILE-TO-TEXTILE RECYCLING

Ten Nordic brands that are leading the way

Well dressed in a clean environment

In 2015, the Nordic Council of Ministers launched an action plan for sustainable fashion and textiles, Well Dressed in a Clean Environment, in response to a growing recognition of the need for a sustainable transition in the sector. This case wallet has been produced under one of seven projects launched to implement the action plan, and responds to one of its objectives; to 'promote business models that stimulate recycling of fibres into new textile products'.

Why textile-to-textile recycling

Extending the active lifetimes of textile products is a key means of reducing the environmental impacts caused by textiles and this should be prioritised.¹ This also gives greatest opportunities for extracting continued economic value from garments.² However, all textiles eventually become worn out and must be handled as waste.

Material recycling of textile waste, especially recycling back into new textile products, is environmentally advantageous compared to incineration or landfill.³ Under current conditions, when textiles are recycled, this is mostly to low-grade non-woven products like filling or insulation.⁴

Stimulating textile-to-textile recycling requires effort at both ends of the value chain. A reliable *supply* of recyclable used textiles needs to be secured, and the *demand* for recycled content fibres and yarns needs to be increased.

A number of brands in Nordic countries and elsewhere have been taking on these challenges and venturing out on pathways towards textile-to-textile recycling.

Ten brands on the pathway to recycling

There are many technical, economic and systemic challenges.⁵ Nevertheless, a number of brands in Nordic countries and elsewhere have been venturing out on pathways towards textile-to-textile recycling. They are responding to a rising recognition that the industry should take responsibility to reduce its pressure on raw resources in the face of growing global populations.

This wallet presents cases from 10 such brands. These are:

- 1 EGETÆPPER – carpets and floor coverings
- 2 ELSK – small fashion house
- 3 FILIPPA K – high end fashion for men and women
- 4 H&M – high street fashion for men, women and children
- 5 HOUDINI SPORTSWEAR – outdoor clothing
- 6 LINDEX – high street fashion for women and children
- 7 NORTEX – producer of duvets and pillows
- 8 PEAK PERFORMANCE – outdoor and urban wear
- 9 PURE WASTE – urban wear
- 10 TOUCHPOINT – workwear and uniforms

These brands are engaging in many different ways. All are making use of yarns/fabrics with recycled content in selected new products. Some are designing products for ease of recycling, thus providing future supplies of recycled fibres.

A few are developing or are part of closed-loop systems. Under a closed loop system a brand or a partners takes back used products from consumers, for extracting material as input to the next generation of products.

A constantly changing picture

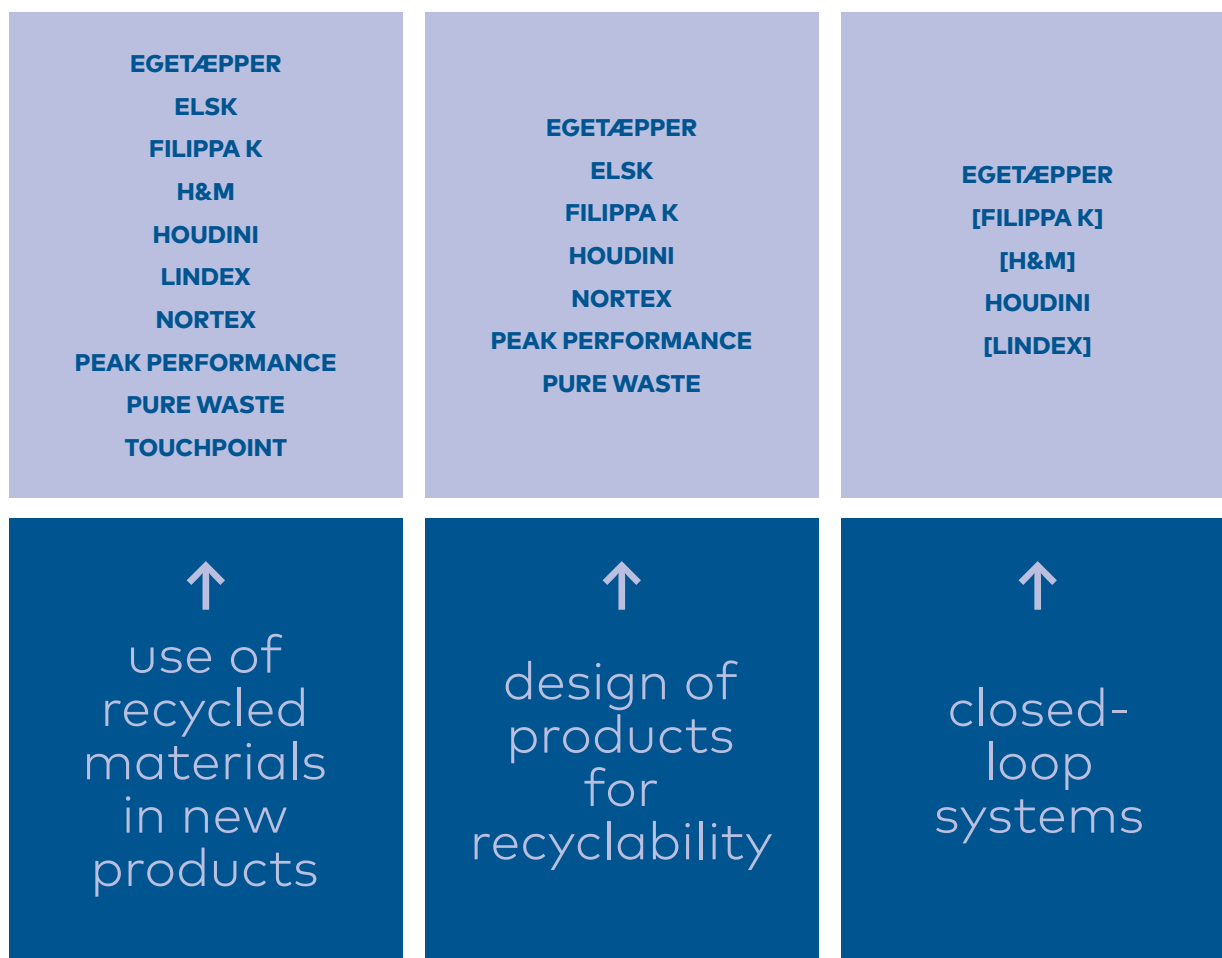
Our picture is a snapshot of a moving scene. All ten brand are committed to moving more deeply into circular thinking. For many the starting point has been to use readily accessible recycled fibres such as recycled PET or pre-consumer cotton waste, and then moving on to more difficult materials.

Designing for ease of recycling often lies further along the process. For some brands, this may eventually lead to take-back systems. Once in place, take-back systems can act as a catalyst for broadening circular thinking out to other products.

However, pathways followed by brands differ. H&M, for example, uses recycled content in products and has a used textile collection system in place but is not yet designing products for ease of recycling. Small brand, Elsk, on the other hand designs for recycling but has no plans for setting up a take-back system.

Approaches often depend on the size of a brand. Large established brands tend to begin with a single product or collection, while smaller start-ups might have had circular thinking integrated into their business plans from the beginning.

Current status of engagement*



* the brands identified in brackets are partially but not wholly engaging in closed loops e.g. have set up a take-back system but not with a feed-back loop to their new products.

Typical transition pathways towards textile-to-textile recycling



Whatever the development pathway taken, all brands have experienced challenges along the way. Close partnerships with suppliers, research institutions and other key actors have been critical in finding solutions to these.

Why this case wallet?

The aim of this wallet is to share with the rest of the industry these brands' experiences and motivation, the challenges they've encountered, how they've overcome these and where they are heading now, with the rest of the industry. The hope is to inspire other brands to begin engaging and stand as further frontrunners in a transition towards textile-to-textile recycling in the global textile and fashion industry. The wallet is just one output of the project. The other is an analytical report that delves deeper into common challenges and solutions.

The project has been managed by the Danish EPA and the Nordic Council of Ministers. The project has been carried out by a consortium led by PlanMiljø (Denmark) and including IVL (Sweden) and VTT (Finland).

EGETÆPPER

– on the road to the closed loop carpet

Danish carpet manufacturer, Egetæpper, uses recycled fishing nets in carpets, is designing for easy separation of materials end-of-life and has take-back systems across Scandinavia. But there are bumps along the road towards full closed loops.

Recycling is good for the environment and for business

For more than ten years, Egetæpper has focused on minimising resource use and taking responsibility for its products beyond the point of sale. According to the brand, reducing resource use is not only good for the environment, it's also good for the bottom line.

Moreover, producing carpets from recycled materials strengthens Egetæpper's profile. When delivering products to the professional market, recycled content creates value for the customer and helps differentiate it from its competitors.

Carpets from old fishing nets

Sourcing recycled materials is a challenge for many brands. Egetæpper has solved this through

establishing close ties with its suppliers, which have developed over many years. These partnerships are key in developing more sustainable products.

Today, Egetæpper produces carpets from recycled materials such as fishing nets and PET bottles and is working towards designing products that can be recycled 100 %. This work does not come without challenges.

Chemical content must be controlled

One key challenge is the chemical content of the waste materials that provide the input to their new products. This must be controlled and tested to guarantee a certain quality of the product. Egetæpper has set criteria for its suppliers on chemical content.

use of
recycled
materials

design for
recycling

closed
loop





Closed loop systems are not only about designing for ease of disassembly and recycling but also establishing systems for getting products back end-of-life. This is far from easy.

A further demand is that the recycled material should not affect the durability and quality of the end product. It has been a key objective from the beginning that carpets made from recycled material must have equal durability and quality as conventional carpets.

Carpets with mixed materials to be designed for disassembly

It is a complex process to separate different materials in the recycling process; hence there is a need for technological development, and a need for reducing the number of different materials in the product. This raises challenges regarding quality, regulation on for example flame-retardants and product characteristics such as how well the carpet lies on a floor. Where a mix of materials is

necessary, the brand's ambition is to design such that components are easily separated.

Cooperation is key, and increased sustainability is often the result of a partnership between two or more actors along the supply chain that share sustainability ambitions. Having a client like Egetæpper with strong ambitions and goals can provide the supplier with the security it needs before risking making large investments in new technology and product development. This can otherwise be challenging for an SME.

Moving towards fully closed loops

Closed loop systems require both designing for ease of disassembly and recycling and establishing systems for getting products back end-of-life.

PARTNERSHIP WITH AQUAFIL

Egetæpper has a long-term partnership with Aquafil, supplier of ECONYL® regenerated nylon. Egetæpper was one of the first clients to use 100% Econyl in its products and also supplies leftover yarns and fluff from the upper layers of carpets to Aquafil's regeneration plant. Aquafil not only uses post industrial waste (such as the yarn provided by EGE) but also post-consumer waste such as old fishing nets.



Logistics in take-back systems are a key challenge and take-back has so far only been established in the company's Scandinavian markets. Even here, infrastructure and regulation differs between

countries. In the long-term the brand's ambition is to establish take-back schemes in all 70 countries they operate in.

LESSONS LEARNT

- Producing products with recycled content is a good story to tell consumers and helps differentiate businesses from their competitors
- Close partnerships are essential in the development process where new technical solutions are required

ELSK

– telling the story behind the garment is essential

Elsk's co-owners have a personal philosophical ambition on minimising environmental impacts. This can also make business sense if the story is communicated well. Consumers are ready to buy sustainable garments provided that style isn't compromised.

Start-up brand engaging in sustainability from the outset

Small Danish fashion start-up, Elsk claims to be everything the established fashion industry is not. The owners' overall focus is their wish to be a sustainable company, and use processes that are as gentle on the environment as possible. They use organic materials, and have several products that contain recycled materials.

Elsk produces a knitted shirt that is made from 95 % recycled jeans, and T-shirts from recycled cotton. The brand has a strong focus on the lifetime and quality of its products and work with single fibre types to increase recyclability. The only exception is the thread for seams that uses a cotton/polyester mix for added strength.

Sustainability is another form of quality

One of the challenges to using recycled materials is the perception of quality, what it means and how consumers experience it. Recycled materials often don't feel as smooth as virgin fibres. Elsk's knitted shirt from recycled jeans doesn't feel as soft as a shirt made from merino wool although its expected lifetime is just as good. The consumer needs to hear the story behind the product to understand why Elsk has used this material and to understand that sustainability is another form of quality.

One way the brand communicates this is by using Textile Exchange's *Recycled Claim Standard*.⁶ However, Elsk believes that the certification has a limited impact on its consumers being just one in

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design for
recycling

closed
loop





Our knitted shirt made from recycled jeans is valued for its quality. Unlike a shirt from merino wool, the quality is communicated by its sustainability story and not its softness.

a vast jungle of labels. All the fabrics that go into their products are also GOTS certified, but Elsk doesn't label its products with GOTS because of the relatively high expense of gaining the certification.

Design for recyclability

The brand avoids polyester in its garments to avoid what the owners perceive as a risk of microplastic pollution. The designers also try to avoid mixing fibres in general and work with clean fibres. This does not challenge the quality, but the design of women tops for example and the expression of the product is a challenge. To solve this they are testing mixes of cotton with tencel and

lyocell, which still allow chemical recycling since both are cellulose-based.

The industry is in a transition period

According to Elsk, there is a need for simplified guidelines for brands regarding sustainability and circularity, and there is a need to communicate what is wrong with current practices. The company owners believe that the industry's penchant for ignoring environmental impacts and bad working conditions is coming to an end, catalyzed in part by the series of accidents in Bangladesh in 2012 and 2013.

PARTNERSHIPS WITH SUPPLIERS

Using yarns with recycled content can be a technical challenge for knitting processes due to limitations in yarn strength. Introducing new materials and techniques is always a challenge and this was also the case for Elsk's main supplier. The development process was fraught with failures and many prototypes were produced on the road to the final product. In the trial and error process, Elsk relies on the competences and technical knowledge of the suppliers to meet their wishes. This has led to strong partnerships between supplier and brand.



LESSONS LEARNT

- Consumers desire green products to a greater extent than the industry appreciates, but communication is important in catalysing this demand.
- Think of recycled content as a quality characteristic that is just as valuable as the feel of material and style of garment. Sustainability is a story that needs to be told.
- Design remains key, recycled content products still have to look cool or no one will buy them.



FILIPPA K'S

Front Runner – on the road to Circularity

A long product life is the most important environmental consideration for Filippa K. Front Runner is a pilot initiative aimed at using recycled or recyclable materials without compromising durability

A long life is paramount

Swedish high-end fashion company, Filippa K, has a long-term goal that by 2030 its entire collection is designed and produced following the principles of circular economy – *reduce, repair, reuse and recycle*. The brand is already offering products and services on the way to this goal.

For Filippa K quality and design style to give a long product life are of utmost importance. These are qualities that can't be compromised since a long life maximises environmental benefit.

Front Runner is piloting the way ahead

Filippa K's Front Runner is a pilot initiative to test which types, and what shares, of recycled materials can be used without compromising the quality and durability of the brand's products, and to test

design for recyclability. The collection represents a technical learning process on the way to fully circular collections.

Front Runner products have been produced using recycled pre-consumer wool obtained via the Re.Verso platform (see box). The environmental impacts and benefits of the life-cycle of Front Runner products are evaluated during the design period. The end-of-life of the products become an important consideration; can they be recycled and do they last as long as other products? Filippa K has also made use of recycled cashmere and polyester from recycled PET in other products.

Collective closed loop system

Filippa K is also engaging in a *collective* closed loop system. They collect wool waste from their own



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loop





There is a lack of inspiring examples on how to design for circularity. We need more focus in education on training current and future designers in recyclability.

production of clothing (pre-consumer waste) and send this to sustainable material hub C.L.A.S.S. (see box). Filippa K also uses the hub to buy recycled wool, cashmere and other sustainable materials according to product needs.

A key advantage of using a large hub like C.L.A.S.S. is the wide variety and range of materials available. Filippa K wished to use recycled wool that was pre-sorted by colour and thus didn't need to be dyed for use in Front Runner products. C.L.A.S.S. was able to meet this demand via the Re.Verso platform.

Finding the right ratio of recycled material

It has been a challenge to find the right ratio of recycled wool and virgin wool to ensure and maintain Filippa K' high durability standards.

One of the first Front Runner products was a woollen coat that had problems with pilling. This was partially improved through adjustments to the mechanical production and the product was placed on the market with additional care instructions for consumers. A further challenge has been to find recycled fabrics that meet quality demands while not being overly expensive in comparison to virgin materials.

Industry needs to be clear about good and less good choices

To increase demand for recycled content and other sustainable initiatives, Filippa K feels that consumers need to be informed on what are good and less good choices. The Higg Index⁷ developed by the Sustainable Apparel Coalition is a starting point but needs further development.

PARTNERSHIP WITH MATERIALS HUB C.L.A.S.S.

The Milan-based company C.L.A.S.S (Creativity Lifestyle and Sustainable Synergy) is a hub that facilitates the exchange of sustainable yarns and fabrics between partners across the value chain. As an example, C.L.A.S.S and its partners set up the Re.Verso platform, an exchange system for recycled wool. Filippa K and other brands supply pre-consumer wool waste which is then redistributed via recycling companies, back to members for use in new products. All recycled content can be traced back to its original source.



LESSONS LEARNT

- Close cooperation with suppliers is of key importance for product development
- A brand needs to be clear and specific with its suppliers on what it expects and wishes for from its products, including those with recycled content
- Customers should be informed of a brand's sustainability initiatives and the environmental benefits that these bring.

H&M

– working at both ends of the loop

H&M believes the future lies in innovations that allow fibre-to-fibre chemical recycling and in effective collection logistics and automated sorting. The entire value chain needs to be involved including consumers.

Reacting to future resource scarcity

Global fashion brand H&M has a vision of 100 % circularity of its products in the face of a future with scarce resources and growing populations. This means integrating circularity into every part of the value chain. The brand will design for longer lifetimes and ease of recyclability and by 2030 will only use recycled or other sustainably-sourced materials in its products. H&M already began using recycled materials in 2009, and in 2010 launched the first Conscious collection.

Ceiling of around 20 % of post-consumer cotton

An increasing range of H&M products include recycled fibres: cotton, wool and cashmere. The company uses both pre- and post-consumer waste. Pre-consumer waste arises in textile mills

and factories and post-consumer waste comprises used clothing. Clothing tags inform the consumer if an H&M product includes fibres recovered from used garments.

H&M's material researchers together with its suppliers have found a ceiling of around 20 % of post-consumer mechanically recovered cotton fibres blended with virgin cotton before strength is compromised. Higher shares are possible with pre-consumer cotton waste and for other fibres like wool. H&M is also the second largest global user of recycled polyester for textiles.

H&M is closely following developments in chemical recycling technologies and will fully engage in design for recycling once these have reached

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We foresee a future where chemical recycling and other innovations allow design for recycling without the need for mono-materials.

maturity. Meanwhile, the brand takes responsibility for the post-consumer phase of its products via a take-back system that it runs in partnership with I:Collect. Customers can deliver any brand used clothing in any state for reuse and recycling. H&M are using waste cotton collected under the take-back scheme in its Conscious Denim collections and have also launched products up-cycled from collected garments.

Sorting needs to focus on textile-to-textile recycling

Due to the high volumes of textiles that H&M sells, the brand is focused on transitions for the whole

industry. According to the brand, we need a systemic change from a linear resource system to a circular system that engages all stakeholders.

Part of the solution lies in developing effective collection logistics and automated sorting to get the volumes and qualities of recyclable textile waste that can transform the industry. Manual sorting is unavoidable for reusable textiles but is expensive and inefficient for non-reusables suitable for recycling. Here automated sorting such as that represented by the SIPTex pilot⁸ is needed.

H&M'S MANY PARTNERSHIPS

H&M believes in the future of chemical recycling and has formed a partnership with Worn Again, a UK innovator developing textile-to-textile chemical recycling processes. The brand also works closely with a Spanish supplier of yarns and fabrics with fibres mechanically recovered from textile waste, Reconvertex. Reconvertex yarns are certified with OEKO-TEX 100 to assure lack of hazardous chemicals, and the Global Recycling Standard to assure recycled content.

H&M is engaged in networks working at the forefront of circular thinking such as Mistra Future Fashion, the Ellen MacArthur Foundation, the Circular Fibre Initiative and Cradle to Cradle Fashion +.



The future lies in chemical recycling

In H&M's view, mechanical recycling is a stop-gap with a number of limitations. Each time fibres go through a mechanical recovery process they are shortened; and short fibres compromise strength and durability. Moreover, currently design for fibre-

to-fibre recyclability means using just one type of material for the whole product. H&M foresees a future where chemical recycling and other innovations allow design for recycling without the need for mono-materials.

LESSONS LEARNT

- Brands have an important role to play in creating a demand for recycled fibres. Work closely with supply chains to make it happen.
- The entire chain needs to be involved when moving down the sustainability path including consumers. Inform and engage them in what you are doing.
- There are many platforms and network working on the issues at hand. Get involved and use the knowledge that is there.

HOUDINI

Sustainability is fully integrated in Houdini's design process

By having sustainable thinking central in the product design process, Swedish outdoor brand, Houdini Sportswear, ensures that the most appropriate environmental strategy is selected for a given product. A key principle is ensuring circularity while maintaining durability.

A long active lifetime is paramount

Striving for sustainability is not an add-on for the brand, it's a central principle and is integrated in to all elements of the design process. This may add some initial costs, but the company's brand has been significantly strengthened as a result. For Houdini it is not an option to work with a linear take-make-dispose model.

The strategy for each product depends on its function. A key principle for all Houdini products, though, is that they must be hardwearing. Houdini's customers expect their products to last and a longer life gives greatest environmental benefits. The goal is for all Houdini garments is to be circular. This means looking for materials that have

both recycled content and are recyclable, without compromising on durability.

Closing loops and designing for recyclability

Houdini collects its used products from consumers for reuse and recycling. Worn out 100% polyester products are sent to Teijin for recycling (see box) and it also sources recycled polyester fibres from the company thus closing the loop. In addition to chemically recycled material, the brand also uses recycled nylon and polyester recovered from PET bottles.

Designing for recyclability is a further part of Houdini's design process. Keeping materials and products simple is key. If a shell fabric is polyester,

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Photo: Linus Meyer



It's always been important for us to share our vision with our suppliers so that we can inspire one another and find solutions together. Long-term partnerships are key to our product development.

then the zips and fasteners are also made from polyester. The brand also tries to avoid unnecessary gimmicks that complicate disassembly.

Recycling and recyclability can challenge longer lifetimes

Designing for recyclability can challenge other important product characteristics like durability and low weight. The brand's most popular fleece is produced with a nylon/polyester mix to ensure a 10-year lifetime. So far it hasn't been possible to achieve this with a single fibre type.

Small production batches can challenge 100% recycled content

The relatively small size of orders for a niche brand like Houdini can present a practical challenge for fabric suppliers. Fabrics with up to 50% recycled

fibres can be delivered in small batches, since the recycled fibres can be inserted as the weft (across the fabric) on production looms as required. Higher shares require that the warp of the fabric, and thereby an entire production batch, must comprise recycled fibres.

Storing used products until solutions are found

Houdini currently accepts all its used products in its take-back system, for recirculation to new users or for recycling. The brand doesn't yet have recycling solutions for nylon or mixed-fibre products but hopes to develop these. Until then it will keep the used products in storage. Further goals for the brand are to increase its use of recycled synthetics and natural fibres like wool and to expand take-back systems to all shops that sell Houdini products.

ECO CIRCLE AND OTHER PARTNERSHIPS

Houdini has found that new products are best developed in partnership with existing suppliers. In the case of closed loop polyester, Houdini engaged in an existing initiative – the ECO CIRCLE partnership. ECO CIRCLE's over 130 global members collect their used 100% polyester products and send them to Japanese company Teijin for chemical recycling. The members may also buy recycled polyester back from Teijin for use in new products. Houdini also has key partnerships with suppliers of fabrics with recycled content such as Taiwanese, Lakatex.



Photo: Linus Meyer

LESSONS LEARNT

- Work together with existing suppliers to develop solutions so the industry can move forward together
- Integrate design for recyclability directly into the design process means that these issues are considered early on
- Use a full value chain eco-label such as BlueSign can ensure that recycled fibres don't include hazardous chemicals

LINDEX

– remaking denim products from previous seasons

The Swedish brand has a goal that by 2020 80% of all its garments will be produced more sustainably and is investigating promising options for subsequent scaling up. One example is re-making used denim collected by charity partner Myrorna into new collections.

Sustainability is a core value

Sustainability and increasing resource efficiency are core values for Swedish fashion brand Lindex. Increasing circularity and doing more with less is necessary to address environmental and planetary boundaries under the threat of increasing populations. Lindex' goal is that by 2020 at least 80% of its garments will be designed and produced with sustainability in mind. The company is investigating various promising options and exploring which of these can be scaled up.

Quality and fibre strength in recycled cotton

In 2011 Lindex started to promote textile reuse and recycling in cooperation with Swedish NGO, Myrorna. Like a number of other brands Lindex began with fibres recycled from waste plastic products (PET and PA), mostly for tights and swimwear

but also began engaging in the more difficult field of textile-to-textile recycling. This began with the use of recycled post-consumer denim in new denim collections.

The brand subsequently began thinking more holistically: how to recycle their own products including products that already contain recycled fibres. Mechanically recovered cotton has a shorter fibre length than virgin cotton. Recycling it once more will compromise the quality and strength of 3rd generation garments.

One potential solution is to 'upcycle' or 'remake'; using fabric cut from post-consumer textiles to sew new products. In 2016 Lindex released a sneaker made from used denim collected by Myrorna in Lindex stores. In 2017 the company

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Everything that is done outside the regular supply chain is challenging. It requires extra work and new routines for the whole organisation.

launched Re:Design: new denim garments made from cut-up denim from earlier denim collections.

Needs buy-in at leadership level

According to the brand, everything that is done outside the regular supply chain is challenging, time consuming and expensive. It requires extra work and new routines and systems for the whole organisation. For it to carry through, it was important to gain commitment to the process from the top management in Lindex.

Lindex has also experienced technical and legal challenges. There remains a lack of available techniques and systems to handle mixed and complex

materials on a large scale and for keeping track of chemical content in used garments and recovered fibres. Moreover, waste legislation can be unhelpful and challenging, limiting the impact and speed of scale up processes.

Control and traceability is essential to ensure safe material loops

Lindex has high hopes that via technological advances, chemical recycling will soon be available on a large industrial scale. This would enable recycling content of natural fibres greater than the current 20-25%. The chemical content of recovered materials needs to be controlled and traceable to ensure safe material loops.

RE:TEXTILE AND OTHER PARTNERSHIPS

Lindex worked with Re:Textile to create the Re:Design collection. The collection was "remade" locally in Borås and time was taken to develop repeatable re-design processes including disassembly, reconstruction and style updating. The challenge was to find a balance between vision, cost and supplier capabilities. The project has enabled Re:Textile to widen its portfolio of services for other clients.

Lindex is part of a number of networks that enable its designers and developers to keep up with latest innovations in circular economy. It has close connections to Wargön innovation, Bioinnovation, Myrorna and Mistra Future Fashion.



LESSONS LEARNT

- It takes time and money to go outside the normal supply chain: a brand's leadership needs to lead and strongly support the process.
- Remake initiatives seem to excite and attract both customers and the media far more than using recycled fibres in garments.
- Big brands must lead the way and inform consumers on advances.

NORTEX

– pushing for sustainable textiles in healthcare

Nortex is working both on use of recycled fibres and design for recyclability in duvets and pillows for the healthcare sector. Engaging hospitals is challenging but this may change in the future as the focus on green procurement increases

Pushing the green agenda in healthcare textiles

Nortex is a Danish producer of duvets, pillows and cushions and the brand's Nortex Care collection is designed specifically for hospitals. Over the last four years the company has aimed to increase the use of recycled fibres in this collection.

The motivation has not arisen as one might expect following a demand from hospital procurers for greener products. Rather it has been internal, driven by Nordic Care's awareness of the scarcity and overconsumption of raw materials.

Increasing recycled fibre in duvet fill without compromising resilience

Nortex Care uses recycled fibres in its filling material for duvets. Duvets and pillows need to remain

fluffy, even after long usage in order to retain warmth or to act as support. Moreover, they need to be resilient to the high temperatures used in hospital laundries.

When Nortex first began using recycled fibres, it was hard to retain this resilience with shares of recycled content over 30%. The breakthrough came when they found that one of the three functionally different polyester fibre types used for fill could be replaced entirely by recycled fibres without compromising quality. Recycled fibre quality has also improved and the share of recycled content in duvet fill now lies at 50%.

use of
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materials

design for
recycling

closed
loop





Retaining durability and resilience when using recycled content has been the main technical challenge. Our duvets need to withstand at least 50 washes at high temperature.

Take-back systems and closed loops

Nortex is also considering how to design for, and recycle their own products. The company is beginning with the outer lining of duvets and pillows that are already 100% polyester and therefore eminently recyclable. The main challenge is organisational: how to get their hands on the duvets and pillows again at the end of their technical lives.

The company has tried setting up take-back systems in hospitals, but since hospitals tend to use duvets and pillows from a number of suppliers, and don't have a system for sorting these, Nortex risks getting duvets and pillows back that

aren't theirs. RFID tags on products could be one solution but this requires more engagement from hospitals.

Nortex hopes for greater engagement from hospitals

Nortex wished to move forward on full closed loops in the future and the most pressing issue is to work further on take-back system in hospitals for its products. Once these are in place and functioning, there will be greater motivation to work on recyclability.

WORKING WITH RESEARCHERS

Both suppliers and research institutions have been important partners for Nortex in the development of alternative material sources. Nortex chose to work with their existing eastern European suppliers of fill who work closely with the Hohenstein Research Institute in Germany. Together, Nortex, the fill supplier and the researchers at Hohenstein worked out how to increase recycled content while retaining the fill's resilience. The cooperation has been an iterative process, based on setting and adjusting ambitions and investigating and testing solutions. When necessary, the team has gone back to the drawing board to try something new.



Nortex experiences interest for green products from hospital procurers, but this often conflicts with top management's direction to focus only on lowest price. This is expected to change as hos-

pitals are required or expected to include green criteria in procurement tenders. Nordic central and regional governments are increasingly engaging in setting green procurement targets and strategies.

LESSONS LEARNT

- Durability is more important than recyclability, particularly for hospital textiles
- Working closely with technological institutes can increase the chances of finding solutions to technical challenges
- Designing for recyclability is only useful if a system is in place to direct used products to an appropriate recycling system

PEAK PERFORMANCE

has ambitious goals for recycled content

These goals are particularly challenging because the brand is simultaneously expanding from pure outdoor to urban wear. One way Peak Performance is tackling the challenge is via a material library for designers

Use of recycled fibres is part of a wider objective

Use of recycled fibres is nothing new for Swedish outdoor clothing brand Peak Performance, but in February 2017 the company set a goal that by 2020, 50% of the polyester and nylon in its collections will be from recycled sources.

The sustainability objectives have been adopted at leadership level. In the first stages the company is focusing attention on the products with highest volume sales, in order to maximise early environmental gains.

The sustainability goals are challenging because the brand is currently expanding from pure outdoor to urban clothing. Urban wear already represents 30% of the brand's turnover giving many new types of clothing, materials and fibre

types for which the company must find sustainable solutions.

An initial focus on recycled synthetics

Peak Performance outdoor clothing mainly uses synthetic fibres so the focus within recycled fibres has also been on synthetics. The brand is using fibres recovered from both *pre-* and *post-consumer* waste. The brand has a hands-on approach to its supply chain; visiting and checking its suppliers of fibre, yarn, clothing and trimmings. The company also guides its suppliers on where to source recycled fibres.

A recycled content fabric library for designers

Peak Performance's designers are assisted in selecting fabrics with recycled content via a fabric library. The library contains many different materi-

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Adoption of goals at leadership level is key since using these materials will impact margins during the transition period.

als for a wide range of functions. Material specialists are gradually working through the library, finding and developing alternatives with recycled content for each of the material types. These are given a green mark signalling a green choice for the designer.

The brand is also working towards designing for recyclability. Its designers have recently attended a course on sustainable design including design for recycling and are keen on making use of this new knowledge.

Finding sufficient quality has become less of a challenge

According to the brand, a decade ago it was difficult to find recycled fibres of sufficient quality. Many suppliers can now offer the same quality as achieved by virgin materials with recycled content. At least for synthetic materials. Today the main challenge lies in negotiating a reasonable price. Colour choice can also still be somewhat limited in comparison to virgin materials and a brand may need to be adaptable in its demands.

PARTNERSHIPS WITH ECAP AND REPREEVE

Peak Performance is one of nine European brands partaking in pilot projects under the European Clothing Action Plan (ECAP)⁹. The pilot projects were initiated in 2016 and continuing through to 2019 with the aim of expanding market share of recycled content clothing and fibre-to-fibre knowledge and technology in the industry. ECAP consultants have assisted Peak Performance in setting their recycled fibres goal and on developing strategies to achieve this.

Peak Performance also has strong partnerships across its value chain. One of its suppliers, Repreve, is taking control of its own supply chains to ensure traceability of the recycled content and subsequent spinning and knitting in Italy to ensure clean production.



A need for support from other actors

According to Peak Performance, the industry needs support from other actors to help in the transition to more sustainable materials. NGOs can assist in raising public awareness. Govern-

ment can provide support via restriction on what can be imported, via taxes on virgin polyester or national targets for use of recycled fibres.

LESSONS LEARNT

- Dialogue is important throughout the value chain; visits to factories are instrumental in ensuring good environmental and labour standards
- A brand needs to be adaptable regarding issues, like colour choice
- Clear direction and a drive for change at leadership level is essential; using recycled fabrics will impact the margin during the development period

PURE WASTE

– Turning Factory Waste into New T-shirts

Pure Waste's owners couldn't find reliable supplies of recycled content yarns. They now have direct control of production facilities in India spinning pre-consumer factory waste into new yarns for their T-shirts, hoodies and sweatpants. By 2020 these facilities will be collected together with their garment production under one roof

Inspired by a lack of supply

Finnish brand, Pure Waste emerged from the experiences of clothing brand, Costo. In recognition of the huge demands a growing global population will place on cotton and other raw materials, Costo's owners wished to buy yarns produced from pre-consumer waste for use in its collections. However, the company was unable to find a sufficient supply to meet their needs. The natural solution was to develop their own yarns and fabrics.

After mapping out the availability of factory waste with an Indian partner, the decision was made to establish their own spinning facilities for pre-consumer waste close to the source of 'raw materials'; the textile production region around Coimbatore and Tirupur in southern India. The

Pure Waste textile company was founded in 2013 following the successful development of a yarn produced entirely from factory waste.

Avoiding the use of dyes

Pure Waste Textiles produces clothing using its own yarns made from 100 % recycled materials. The main focus is on pre-consumer textile waste such as waste yarn (mostly cotton) from textile mills, coloured off-cuts from textile factories and PET fibres recycled from used plastic bottles.

Fabric and fibre waste is sorted by colour prior to being re-spun. This avoids the need for dyeing, saving large quantities of wastewater and chemicals. The brand produces several grades of yarns and more are being developed all the time. These yarns are used for both knitting and weaving. Knitwear

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Re-spinning of factory waste is common practice in India, but factories keep this a secret because they think their European buyers will complain. This highlights a lack of communication between brands and suppliers.

dominates, but the collection includes some thicker woven fabrics. The company produces t-shirts, hoodies, tank tops, sweaters and sweat pants.

Design for recycling

The recyclability of Pure Waste clothing is also important. Pure Waste designers approach this by replacing hang labels with water-based transfer prints, and by using as few zippers, fasteners and other accessories as possible. Resource efficiency is increased by minimising cutting waste and packaging materials.

Factories already use waste fibres – in secret

By establishing Pure Waste the owners secured its own supply of yarns, but it can still be a challenge to source a stable supply of quality factory waste to feed their yarn production. This is partly

because many textile factories use their own waste in re-spinning processes to reduce costs. Paradoxically, factories hide this practice from their buyers believing that they would not look kindly on this practice. This demonstrates the need for stronger communication on sustainability issues across the value chain.

Ensuring product safety

Pure Waste Textiles would like to move into post-consumer textile waste with a number of promising technologies on the horizon. However, the transfer will require establishing systems to prevent cross-contamination of new products with unsafe chemicals. Pure Waste is also currently working on gathering all their production facilities in a single factory where textile waste will enter at one end and fully finished garments will exit from the other.

PARTNERSHIPS IN ASIA

Local partners in China and India played a key role during the research and development stages. The Indian partner had connections to an engineering company that provided and developed spinning and other equipment. Development of yarns was based on a combination of Pure Waste's own knowhow, the expertise of the co-operating partners and a process of trial and error. Pure Waste's ownership of the factory enabled full process control and establishment and adaptation of equipment. Factories in India providing the waste material are additional key local partners as are local research institutes.



LESSONS LEARNT

- It is crucial for a brand to have a presence in textiles regions of Asia to gain a detailed picture of the whole production chain and what is possible
- Consumers are willing to buy recycled garments when they are given the necessary knowledge and opportunity.
- Lack of knowledge may hinder the spread of design for recyclability; in fact recyclable garments are no more expensive than non-recyclable.

TOUCHPOINT

– turning surplus and used fabrics into new work clothes

Touchpoint works from a principle that to increase the use of recycled textiles, the industry needs to investigate new options and be visible with solutions. Companies need to speak loudly and openly about their successes to raise awareness.

Touchpoint's clients can become frontrunners in recycling

A focus on sustainability and resource efficiency has been part of Finnish workwear brand, Touchpoint's, business plan since its foundation in 2008. The founders believe that businesses have responsibility for more than just raising profits and it offers its client companies concrete solutions on how to execute this wider responsibility. Touchpoint's story as a frontrunner in recycling can also become the story of its clients.

No compromise on quality

Touchpoint's business is based on production of sustainable uniforms and work clothing for large and small companies. It also offers sustainable

reuse/recycling options for the work clothing that is being replaced. Clients include, for example, airlines, cruise lines and restaurant chains.

The company's focus was initially on the use of surplus fabrics and organic cotton, but they have since expanded into using recycled fibres. So far it has used approximately 370 000 recycled PET bottles for production of shirts, trousers, aprons and accessories such as bags.

Touchpoint works closely with its customers in developing new work clothing. Work clothes have to be resilient to hard working conditions as well as be comfortable and look good. The quality has to be at least as good as work clothes from virgin

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Sometimes you have to take some risks in development of products using recycled materials, because it can be time-consuming and needs user trials. This can pay off though by creating more value for the client.

materials. Quality testing includes laboratory tests for strength and durability, and user trials for comfort and utility.

Touchpoint has worked closely with supplier Dutch Awearness (DA) on the design of clothing, such as chef's jackets with stretch, to ensure full recyclability and high quality. Touchpoint has relied heavily on DA's knowledge in the area of circularity. DA has taken a similar capacity building role with many other brands.

Short rollout times can be a challenge

Work clothes are a large investment for a client company and usually the rollout schedule is tight. This can challenge production using recycled and surplus fabrics, since production rates can be slower and delivery times longer.

It has also been challenging to find recycling solutions for the old work clothes that Touchpoint's products replace, especially clothing that has been treated with functional finishes such as fire retardants. It is important to avoid cross-contamination of these substances into products that will be used by sensitive groups such as children.

The future

The company's long-term plan is to move more deeply into the circular economy, adopt a cradle-to-cradle approach, and to have a product portfolio by 2020 that only contains organic, recycled and recyclable materials. Touchpoint is also working on more efficient and cost-effective take-back systems.

PARTNERSHIP WITH DUTCH aWEARness

Touchpoint has strong partnerships with suppliers of used materials and fabrics with recycled content. One of these is Dutch aWEARness (DA). DA offers fully circular models for textiles including textiles from thermally recycled PET. The process of re-melting and spinning of PET material can be carried out around eight times for use in consecutive garments, before impurities require other recycling processes. DA's Circular Content Management System allows brands to fully trace the material's origin and how many times it's been recycled.



LESSONS LEARNT

- New clients may be initially doubtful that clothing from recycled materials can feel and look as good as new clothing. A smart design and visual appeal is an important part of the process of winning them over.
- Don't be afraid to investigate new options and be visible with solutions in order to increase the use of, and the demand for, recycled textiles.



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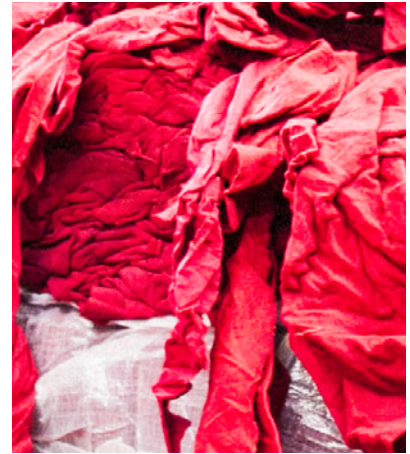
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Nordic Council of Ministers
Nordens Hus
Ved Stranden 18
DK-1061 Copenhagen
www.norden.org

TEXTILE-TO-TEXTILE RECYCLING

Ten Nordic brands that are leading the way

A transition of the textile industry towards a circular economy requires fundamental changes to how the industry operates. One of these is in adopting textile-to-textile recycling where the raw material for new products is sourced from worn out garments and other textiles.

This case wallet describes how ten Nordic brands are engaging in this transition, what challenges they have experienced, how they have solved these and how they perceive the future for the industry as a whole. Developing strong partnerships across the value chain are a key factor in the pathway forward.

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