



# TAKE-BACK OF TEXTILES

DESIGN FOR  
CIRCULARITY IN  
DENMARK





# TAKE-BACK OF TEXTILES

2

## DESIGN FOR CIRCULARITY IN DENMARK

---

**By Else Skjold,**

Associate Professor, PhD at  
the Royal Danish Academy  
(main author and editor)

CONTRIBUTORS FROM  
THE RESEARCH TEAM:

**Malene Kristiansen**

Head of 'Produkt+' and lecturer  
at the Royal Danish Academy

**Astrid Tolnov Larsen**

PhD fellow at  
the Royal Danish Academy

**Henriette Melchiorson**

lecturer at  
the Royal Danish Academy

**Hanne Frederiksen**

lecturer at  
the Royal Danish Academy

**Mette Dalgaard Nielsen**

**Asta Baggesen and**

**Gabriella Constatinou**

research assistants at the Royal  
Danish Academy

**Mette Julie**

**Bundgaard-Nielsen**

fashion lecturer at Design  
School Kolding

**Susanne Guldager and**

**Jennifer Podzcai Ibsen**

fashion lecturers at  
Copenhagen School of Design  
and Technology (KEA).

---



# TAKE-BACK OF TEXTILES DESIGN FOR CIRCULARITY IN DENMARK

## COMPANY PARTNERS OF THE PROJECT WERE:

**Continued Fashion**

**GANNI**

**By Malene Birger**

**Veras Vintage**

**Kvadrat A/S**

**Really-CPH**

**Ege Carpets**

**Dansk Wilton**

**DFD (United Laundries)**

**Leftover**

**NYBO Workwear**

This project was conducted as part of the Circularity Strategy of Lifestyle and Design Cluster, a Danish-based innovation network funded by the Danish Ministry of Higher Education and Science.

*©Lifestyle and Design Cluster 2021*



Lifestyle & Design Cluster.



**Veras**



**GANNI**

BY MALENE BIRGER



**ege**

**kvadrat**

**Really.**

**DFD**





# SUMMARY

‘Take-Back of Textiles: Design for Circularity in Denmark’ is a report presenting research and innovation conducted in the time period of May 2019 to December 2020. The report is based upon findings from a development and research project funded by Lifestyle & Design Cluster and headed by Associate Professor, PhD Else Skjold from the Royal Danish Academy. The research team consists of senior and junior researchers as well as lecturers from the Royal Danish Academy, KEA and Design School Kolding.

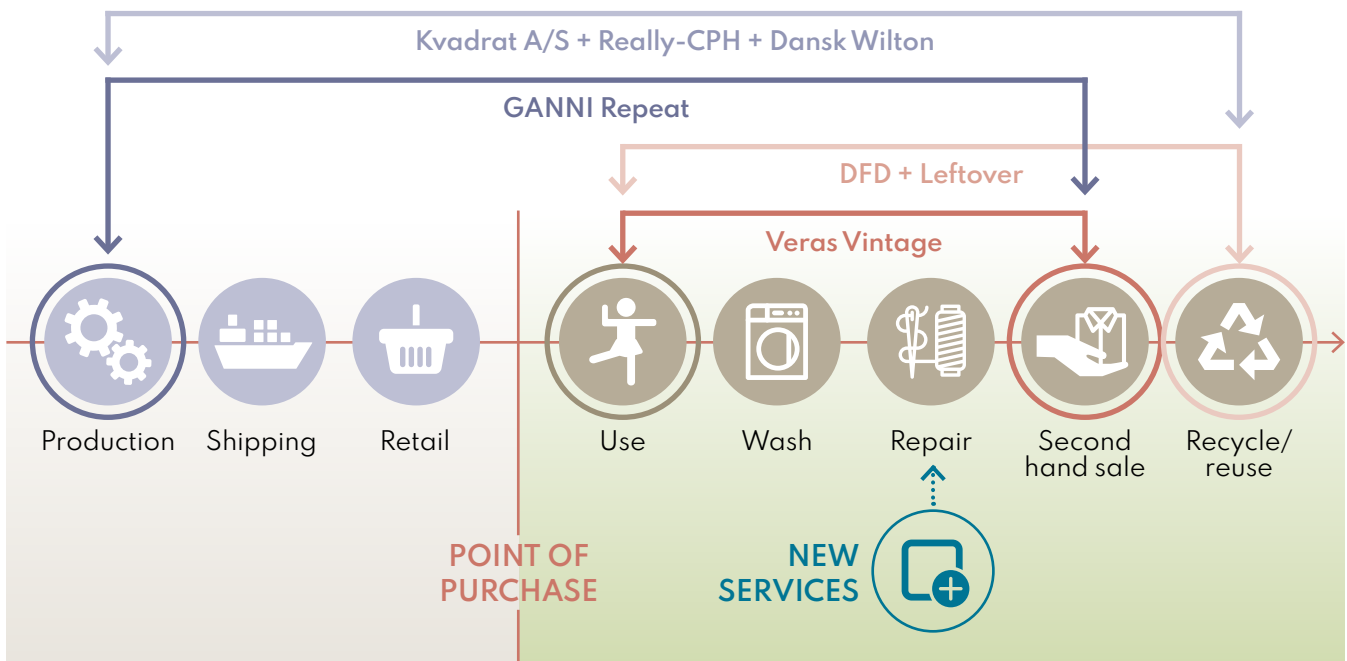
The participating companies represent four areas of design: fashion, workwear, carpets and furniture. The objective of the project has been to investigate the main barriers and drivers for design-led circularity within these areas. The project is based on case studies each representing pilot studies that showcase actual initiatives that were developed and tested throughout the project period. They should not be considered research consultancy initiatives for the individual partner companies, as all insights have been shared in partner workshops with all participants present for cross-fertilization of insights, and furthermore with a wide range of Danish SMEs within the fashion, workwear and interior sectors through a series of webinars conducted during the pandemic. In addition, this report will be disseminated widely both in Denmark and internationally, as well as through peer-reviewed scientific articles and conference papers.

The report starts out with a framing introduction that specifies what types of research questions were pursued in the project together with a definition of how the concepts of circular economy and take-back has been interpreted by the research team and the participating companies.

The following section elaborates on research conducted within the area of fashion based on the framework of the circular fashion platforms *Veras Vintage* and *Continued Fashion*, including *GANNI REPEAT* and *RENT THE LOOK* By *Malene Birger*. This section illustrates the potential synergistic effect between increased product development for circularity on the one hand and drivers and mechanisms for circular business models such as rental or resale on the other.

The next section is dedicated to the area of interior design, represented by case studies from primarily *Kvadrat + Really Cph*, and *Dansk Wilton*. *Ege Carpets* also took part as a less active partner. This section focuses mainly on design for repurposing, i.e., how unused deadstock can be activated in non-wovens for building new niche markets or strengthening existing ones.

Finally, important insights and recommendations for the interested reader are listed to inspire a hopefully more circular future.



Take-Back of Textiles project framework. The model shows the scope of the project by visualizing a circular fashion/textiles service system from the production phase to the reuse/recycle phase. Throughout the report, each represented company is positioned as a case study in the system to clarify how it is or may be positioned in a circular take-back system.

# CONTENTS

---

<b>INTRODUCTION</b>	<b>8</b>
---------------------	----------

---

<b>FASHION</b>	<b>13</b>
RESALE OF PRE-LOVED FASHION CLOTHING .....	15
Veras Vintage.....	15
RESALE AND RENTAL OF FASHION DEADSTOCK .....	21
Continued Fashion, GANNI and By Malene Birger .....	21
Mapping of Resale; GANNI and By Malene Birger .....	25
The Fit and Sizing Project; GANNI and By Malene Birger .....	33

---

<b>INTERIOR DESIGN</b>	<b>39</b>
DESIGN STRATEGIES FOR TAKE-BACK OF CARPETS .....	40
Dansk Wilton, Ege Carpets .....	40
RECOVERY OF NON-WOVEN FIBRES IN FURNITURE .....	46
Kvadrat + Really-CPH.....	46

---

<b>PROJECT INSIGHTS AND RECOMMENDATIONS for Further Work</b>	<b>53</b>
Fashion .....	54
Interior design .....	55
Shared .....	56

---

<b>BIBLIOGRAPHY</b>	<b>58</b>
---------------------	-----------

TAKE-BACK OF TEXTILES:  
DESIGN FOR CIRCULARITY  
IN DENMARK



# INTRODUCTION



# INTRODUCTION

## **TAKE-BACK OF TEXTILES: A PROJECT ABOUT DESIGN FOR CIRCULARITY IN DENMARK**

This cross-sectional project was conducted in the period of April 2019 to December 2020. It was funded with DKK 1.100.000 through the innovation network Lifestyle and Design Cluster (hereafter LDC) through the Danish Ministry of Higher Education and Science. The scope and content are the result of a workshop conducted in Copenhagen on 10 January 2019. More than 60 participants from education, industry and consultancy within the areas of fashion, textile and interior design took part and contributed with ideas for innovation initiatives. The title is based on the interest of these participants in take-back systems for circularity, meaning how design companies can start redirecting revenue streams from new products only and to the so-called secondary market of resale, re-purposing, repair or other similar approaches. Some refer to this as circular business models. Lots have been said about this topic within the last decade, but we rarely see best practice examples of how these models can actually work and what can drive them.

The project work covers selected pilot studies that manage only to scratch in the surface of some of these approaches due to the time frame and budget available. This is an approach widely known within research that has the purpose of driving forward new knowledge in areas that are widely uncovered by fellow researchers. Currently there is very little knowledge at hand of what actually takes place in the existing secondary market. There is a growing body of research on how to design for circularity, but it is rarely implemented in industry. Hence there was a need to conduct deep innovation projects with selected companies, on the premise that the knowledge uncovered was to be shared widely.



Through the project work it has become clear how much there is to learn from various sectors of design – in this case fashion clothing, workwear and interior design with a focus on furniture and carpets. These respective sectors function very differently indeed. Their global logistics are different, and so are their practices when it comes to product development. In fact, some of them are very far apart. But they do have one thing in common, which is that for many decades their business model has been based on linear thinking. Going forward this needs to change, as resource depletion of the linear economy has long met its limits, and new regulatory instruments and policy making will push for more circularity of resources. The question is how this goal can be achieved, and how innovation-driven research can build knowledge and new directions for what to do and where to go. Therefore, the definition of *circularity in this project is that circular design is about design worth circulating.*

What this entails is that we, as a design sector, start to discover how products create value in the so-called secondary market. For far too long, the sector has been driven by a make-use-waste model with rapid product flows based on products that are increasingly less targeted for long-lasting performance in the use phase. This model was hit particularly hard during the lockdowns of Covid-19, as products lost value almost by the minute, as they were stored in containers, warehouses and boutique shelves of closed-down shops. It became clear to many in the sector what researchers have been trying to say for decades: that a linear business model is fragile and non-compatible with the transition we are entering both from a planetary, an economic and a cultural perspective.

But what can a circular business model look like and how does it work? Circularity at this stage in time is mostly limited to the regeneration of fibres from textile waste, which is not necessarily altering the overall economic drivers that are the root of the problem. Also, regenerated fibres are typically not the most advantageous environmental solution as products currently discarded can perform much longer – perhaps with the aid of services such as repair. Current waste fractions and deadstock from retail and companies are

highly complex, and we need to understand how we can utilize them in the best way possible and create new and interesting market opportunities. With the challenges we face in terms of planetary boundaries and the subsequent increase in regulation, it is pivotal that the design sector takes a deep dig into the massive work that lies ahead in order to make Danish design more circular – a necessary step, since ‘business-as-usual’ is not going to be a viable solution in the future.

Denmark is renowned globally for its design traditions. But how can we reconfigure these traditions so that they better adopt to circularity and circular systems? It has been the main aim of this project to filter out some of the many approaches that are necessary in this ongoing transition work and to showcase hands-on examples of innovation work that can hopefully be implemented on a broader scale. Based on these ideas, you can find examples in this report of the following:

- How can we build new narratives (written and visual) that can make the secondary market attractive and interesting?
- How can we learn from existing circularity of design between existing users of secondary market platforms (particularly in the area of resale)?
- How can entering the secondary market strengthen the existing business activities in a company and create synergistic effects?
- What are the implications of circularity for product development and the structure of yearly collections?
- What are the design implications of circularity in relation to repurposing of waste?
- What can we learn from the project across the respective design sectors going forward?

The companies that took part in this project are all respected for being at the forefront of both innovation and sustainable transition work. Therefore, it was an ambition from the start to manifest the insights from the project in an open-source report such as this. It is the hope that the report can create insights into future work within research, education and industry. A humble thanks to everybody who took part for their openness, honesty and collaboration.

*Kind regards,*

*Else Skjold and the full research team from  
the Royal Danish Academy, KEA and Design School Kolding.*

Representatives from Kvadrat, Really-CPH, Continued Fashion,  
By Malene Birger, GANNI, Dansk Wilton, Ege Carpets,  
Veras Vintage, DFD A/S, (United Laundries) LEFTOVER and  
NYBO Workwear.

TAKE-BACK OF TEXTILES:  
DESIGN FOR CIRCULARITY  
IN DENMARK



**FASHION**



# FASHION

The fashion sector is currently characterized by an overflow of garments, representing enormous amounts of resources that are currently being used for a very short time and then discarded. Thus, many garments are caught up as deadstock in retail and warehouses and in the textile waste sector. The DK based NGO, the Danish Consumer Council THINK, revealed that an estimated 677 tonnes of unsold garments are skipped to the waste sector every year (THINK, 2021). The problem has not lessened with the lockdowns of Covid-19, when extensive amounts of garments arrived in Denmark for the various collections and pre-collections and were left unsold. On average, Danes are discarding 36,000 tonnes of textiles per year (Watson, Trzepacz & Pedersen, 2018). Out of these, 30% are being resold in Denmark, but only 3% are believed to really generate economic value. The remaining 70% are being sorted mainly in Eastern Europe. Out of these, 11% is currently being incinerated, while 19% is downcycled, which leaves 40% to be sold on the global resale market. Furthermore, Danes are estimated to swop and resell 7,500 tonnes of garments among themselves on informal markets such as private flea markets, social media and in their social circles, and yet a further 1,600 tonnes are estimated to be resold on online resale platforms such as *Trendsales*, DBA, or Facebook (Watson, Trzepacz & Pedersen, 2018). These numbers include workwear, which was also part of this project.

For many reasons (amongst others the pandemic), *DFD* (United Laundries), *LEFTOVER* and *NYBO Workwear* were active in a series of knowledge-sharing workshops but were less active in the actual research projects. However, it was inspirational to share insights from those two areas, as workwear represents extensive user-led testing and product development that has been lost with the outsourcing of most product development and production of fashion

products. On the other hand, mechanisms such as trends and seasons can drive resale or rental of fashion products, and these are not affecting much of the workwear sector – at least not currently. The potential of this knowledge exchange carries huge potentials for mutual learning in terms of circular design approaches and systems.

According to research estimations by GlobalData, the global resale market for fashion grew 21 times faster than the conventional retail market from 2016 to 2019 and is expected to double from 2018 to 2024, when the total second-hand fashion market will likely reach a value of USD 64 Billion (ThredUP, 2019:5). In a local context, the Danish Reuse Index from 2019 found that 8 out of 10 Danes had bought second-hand goods within the last 12 months and that 45% had sold pre-used goods (DBA & Radius, 2019). According to WRAP & the European Environment Agency, Danes bought 13% of their garments on resale markets, compared to 5% in Italy and 8% in Germany (EEA, 2019). This DK resale market is also relatively more mature in the sense that there are many different concepts for various consumer groups such as luxury vintage, swapping, charity shops, flea markets, online resale platforms and individual resellers on social media platforms (Skjold & Steenstrup, 2020:145-147).

Circular business models such as resale and rental work entirely different than linear ones. Most importantly, perhaps, since the value creation between consumers and garments are detached from linear trend-based and seasonal thinking, the drivers and mechanisms of the market follow different kinds of logic. In order to tap into these markets it is crucial to understand how they actually work and how garments perform on the secondary market. And there is a good reason to investigate this for the DK fashion SMEs. This chapter will present the research conducted together with the resale concept *Veras Vintage* (hereafter VV) and the online platform *Continued Fashion* (hereafter CF) and its collaborate partners, the DK fashion brands *GANNI* and *By Malene Birger*.

## RESALE OF PRE-LOVED FASHION CLOTHING

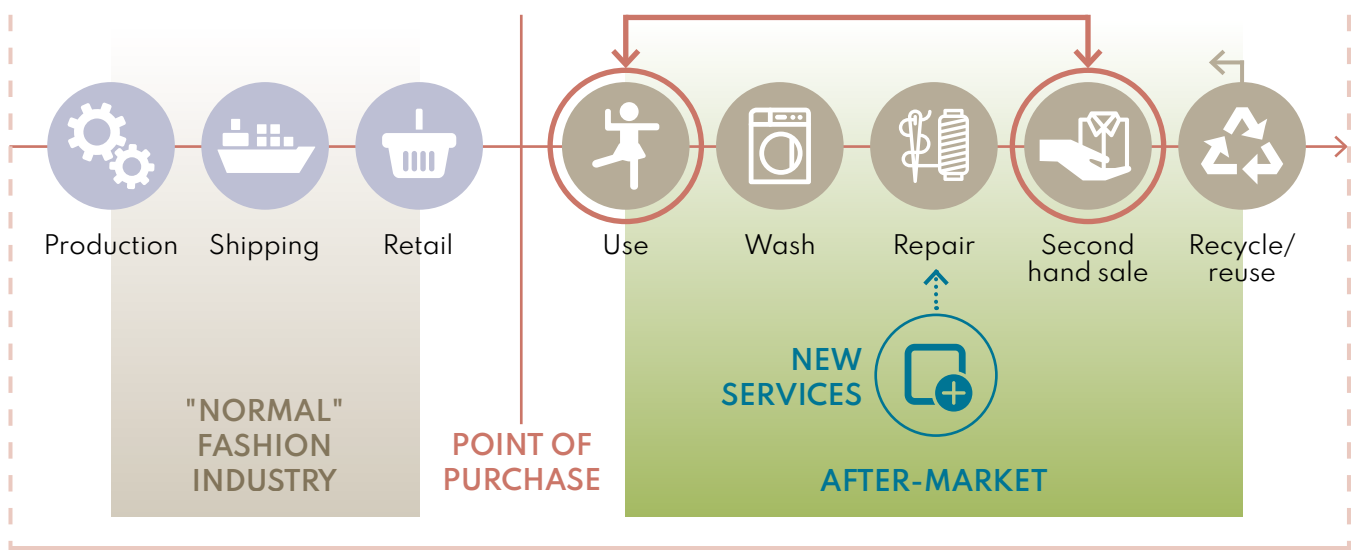
### Veras Vintage

#### WHO

VERAS VINTAGE (hereafter VV) is a platform for swapping, selling, buying, upcycling and reusing fashion clothing that was started by Rebecca Vera in 2016. It is built on the interplay between regular vintage shops, online sale and flea markets with bases in two large cities in Denmark. On top of this, VV occasionally does capsule collaborations on upcycling of textile waste through re-design with various partners. The VV project was carried out by the following individuals from the research team:

Henriette Melchiorsen, lecturer at the Royal Danish Academy, a trained industrial designer who has worked for many years with circularity and sustainable transition work in the cross-field of design, education and business.

Mette Julie Bundgaard-Nielsen, lecturer at Design School Kolding, a trained fashion designer who has worked in industry as well as education with particular focus on design for longevity.



#### FASHION SERVICE SYSTEM

VV's position in the Take-Back of Textiles project framework. As displayed VV is positioned in the interloop between use and second-hand sale.

## CONTEXT AND RESEARCH PLAN

In the initial phase of the project, the research team was in dialogue with representatives of the textile waste sector in Copenhagen and has, throughout the project, been investigating the status of this sector. In this process, it became very clear that the fraction of discarded fashion clothing in the textile waste sector represents a major environmental challenge due to the large amounts of poorly developed products based on mixed fibres that are discarded by consumers every year. It is vital that as much as possible of this fraction is put back to use through resale as long as these fast resource flows exist in the industry. This makes it equally vital to understand how these products create value in resale systems and what types of design parameters define various product hierarchies of the fraction.

As such, the outset of this project was not only to map various fractions of what was sold within the framework of VV but furthermore what they could learn about their brand. From a more general perspective, the research team has had a great interest in discovering what design parameters characterized the various fractions of what was being handed in, sorted and sold at the sales platforms of VV. Such insight can contribute with knowledge to fashion brands in general about the synergy between design development of new products and their potential resale value – information which will be vital going forward to secure a more circular sector.

*The research activities were divided into two interlinking projects:*

1. In the fall of 2019 and the spring of 2020, a mapping was conducted on the various physical platforms of VV, from flea markets to vintage shops. The purpose of the mapping was to gain insight into the various categories of clothing that are being resold and swapped at VV and locate some design parameters that are important in the pricing and value creation between VV and its customers.



2. Throughout 2020, a series of workshops was carried out with core employees at VV with the purpose of qualifying *circular narratives* (written as well as visual). This strategic work was based on a deep dive into the key motivation, drivers, and economic opportunity spaces for VV at present and going forward.

These two activities were interconnected through workshops with the research team and key employees at VV.

## STUDY AND RESULTS

VV receives large amounts of garments from their members and customers in their shops (where they can receive points for purchasing in VV shops) and at their flea markets, where clothing that has not been sold is sorted by VV employees. This means that VV needs to sort huge quantities of garments every week, a process that needed to be optimised. Thus, one aim of this research was to create a case study of generic sorting and assessing systems for easy employee/company implementation and optimal resale value. This is a tool that can be broadly adapted to any type of resale platform but needs to be adjusted to the specific audience and type of platform.

The study is based on fieldwork, interviews, observations and registrations carried out at VV during the sorting process, at selected flea markets and in the VV shops in Copenhagen and Odense. These findings have been analysed and further developed from a designer's perspective. Based on these, 3 assessment categories have been identified: 1. The condition of the garment, 2. Aesthetic and technical attributes, 3. Market potential. A point-giving colour-coding system has been applied, relating to resale value at the sales channels at VV.

These 3 assessment categories were further divided into 4 sorting levels: 1. What can be sold in the shops, 2. What can be sold at VV's own stand at flea markets, 3. What can be upcycled or turned into new products within the framework of VV and 4. What cannot be sold at any of the platforms and is handed over to NGOs for export, resale, repurposing or other.

The guidelines identified are developed specifically for VV hence taking into account their brand profile, customer foundation and the second-hand garment pool at their disposal. They are developed on the basis of strategic insights into the exact brand values, customer circles and price ranges of VV and consist of the following elements:

- a 3-step, simplified sorting matrix that can work as a guideline for VV employees for streamlining of the sorting and evaluation processes. This is a vital tool in the transition from start-up to consolidation of VV.
- a visualisation of the categories in a matrix typically used by fashion companies that define top, medium and basic styles of a fashion collection (fashion triangle). The visualisation was done through visual mapping of photos of garments performing high, medium and low on price, so that employees could share insights on the particular brand values of VV for aligning the sorting processes.

These insights were brought into play as a knowledge pool in the design workshop series with the aim of building strong and clear narratives for VV. The workshops were founded in shared processes of sketching, iterating, prototyping and concretizing the various ideas that came up. This was done with the aim of building 3 to 5 concepts that could help VV share knowledge, inspiration and insights into sustainability work through re-use and resale without overpromising on their actual sustainability performance.

This pilot shows a great potential for qualifying design guidance that could help support the design process when designing for longevity of new garments, as the data showcases the value of garments on the secondary market where they are detached from trends and seasons. It does so by demonstrating how certain materials, aesthetics and technical attributes of garments maintain value (both use value and economic value) through time and use, which is key to developing the secondary market further. It also showcases that driving a secondary market sales platform is tightly connected to market position and customer taste and budget, but it works differently than the primary market with new collections. Each 'circular business model' must be built like a brand itself and locate its own, independent matrix and procedures for supply, sorting, pricing and communicating their products.



Handed-in garments that are exhibited and for sale in a physical Veras Vintage shop. These garments are carefully curated in terms of colours, style, and price level. Selected garments are styled in ensembles to inspire styling tips to customers.



Pool of various garments for sale at a Veras Vintage flea market. The markets take place on a regular basis in several Danish cities and attract lots of younger customers who re-sell or buy garments. Selected customers display their purchases on VV's SoMe channels, which again promotes resale through styling inspiration and other incentives.



Price poster from a Veras Vintage flea market in central Nørrebro. Participants can buy 1 item for 40 kr. and 5 items for 100 kr. from a selection of handed-in Veras Vintage garments. Thus, the markets work as a test for the price level of garments and keep VV in contact with their target group when it comes to taste, price and availability.

Resale hierarchy showcasing products that perform high, medium and low on the resale market of VV. The visualization provides a tool for VV to sort and price items through a structured, knowledge-based approach and could be applied by any other resale platform as a strategic tool. The model is created by Mette-Julie Bundgaard Nielsen from Design School Kolding.

## **RESALE AND RENTAL OF FASHION DEADSTOCK** **Continued Fashion, GANNI and By Malene Birger**

### WHO

Continued Fashion (hereafter CF) is a digital platform for resale and rental of primarily deadstock from fashion companies. It was founded by Viggja Svensson and Peter Svensson in 2017 as a continuation of their previous work with VIGGA, the worlds' first circular kidswear brand that they initiated in 2003.

Currently, 5 brands are collaborating with CF to rent out or resale rather than deposit deadstock as waste. At the time of writing those are Les Deux, Wood Wood, Houdini Sportswear, By Malene Birger and GANNI. This project focuses primarily on GANNI and to a lesser extent on By Malene Birger. Still, insights of the project have benefitted the CF platform as such and thereby also the existing and future brands they collaborate with, as well as the participating partners in the research project.

GANNI is a medium-sized Danish fashion brand founded by Nicolai Reffstrup and Ditte Reffstrup in 2009<sup>1</sup>. It is present in many international markets with the main focus areas of Scandinavia, Britain and the US. In 2019 GANNI initiated GANNI REPEAT for garment rental within the framework of CF.

By Malene Birger is a medium-sized Danish fashion brand founded by Danish fashion designer Malene Birger in 2003. The brand started its garment rental service together with CF in 2019.

The project was carried out by the following individuals from the research team:

---

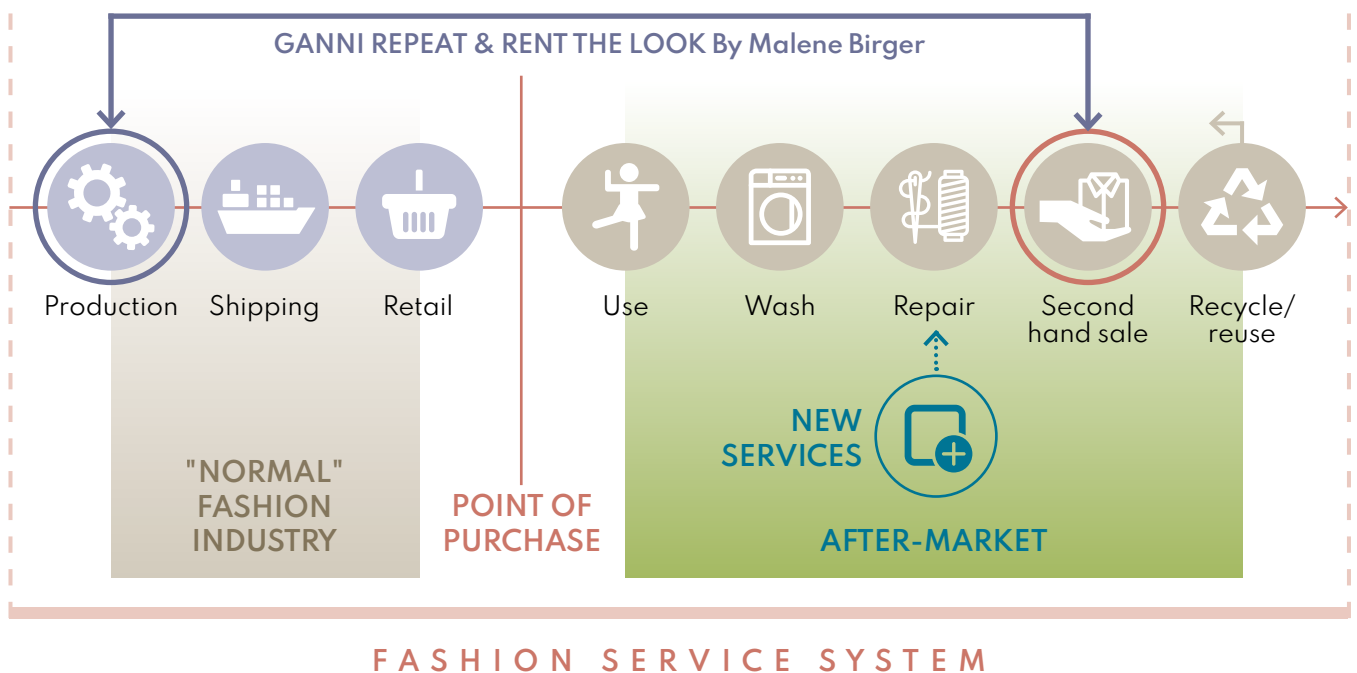
<sup>1</sup> Originally Ganni was founded as a cashmere apparel brand in 2000

Asta Baggesen, holds a PBA in Pattern Design from KEA and an MA in design management (2020) and has experience from working in various DK-based fashion brands as a pattern designer.

Mette Dalgaard Nielsen, holds an MA in Strategic Design and Entrepreneurship from CBS (2020) and has been operating on the resale market as an active trendsetter for years.

Malene Kristiansen, is a trained textile designer who is programme responsible for the BA 'Produkt+' at the Royal Danish Academy. For the last few decades, she has worked for multiple DK-based and international brands in the area of textile print.

Hanne Frederiksen, is a trained pattern cutter who has taught for many years at the Royal Danish Academy and has substantial work experience with pattern construction in the Danish fashion sector.



CF's position in the Take-Back of Textiles project framework. From production via sales to continued rental and second-hand sales.

## CONTEXT AND RESEARCH PLAN

CF is currently in a start-up phase in a completely underdeveloped but very promising market of rental and resale in Denmark. CF is still in the phase of testing out, adjusting and redirecting the tailor-made service strategies for the companies they work with. If they succeed, there is no doubt that many more brands will follow, not only under the CF umbrella but also in the market in general, which will be a very important push for more and better circularity in the fashion sector. However, there are many parameters to consider for this to work, one being what types of design are being pushed out on the market in the first place and how they perform on the secondary market. Another is how each brand might combine the narrative of new trends and seasons with resale since 'new' and 'old' collections are colliding.

GANNI is currently optimizing its sustainability strategy with regard to body-inclusiveness and cultural diversity. The company's sustainability plan is highly complex and ambitious, yet it also embraces the fact that as a revenue-driven enterprise based on linear thinking it causes environmental damage within the fashion sector.

By Malene Birger is a renowned Danish brand who is also trying to adapt its design development and business model to a more sustainable future for fashion.

Based on these considerations and partners, the main objective of this research project has been to help build resilient sustainability strategies that include entering the secondary market. Firstly, the objective was to locate to what level GANNI garments are sold on the secondary market among consumers and how these garments are being valued and sold. Secondly, the goal was to interlink these insights with the design development and collection strategies at the GANNI design team. Thirdly, the aim was to interpolate this with preliminary data from selected studies of By Malene Birger and its rental service. Just like in the VV project, the main interest was the synergy between the primary and secondary market and how

to stimulate slower resource flows through making higher quality design for longer use on the one hand and redirecting revenue streams of the respective companies into the secondary market on the other.

*The research activities were divided into two interlinking projects:*

1. An initial mapping of the existing resale market for GANNI and By Malene Birger in DK and abroad and wardrobe studies with experienced GANNI resellers who are operating on consumer-to-consumer platforms such as Trendsales was calibrated with the activities of GANNI REPEAT in collaboration with CF. Supplementing this was a smaller, similar study of By Malene Birger.
2. 'The Fit and Sizing Project' looked into the product development of the GANNI design department with a particular focus on body-inclusivity, returns due to issues of fit and sizing, and optimization of value creation on the secondary market through adjustment of the sizing schemes and design procedures of the GANNI team.

Results and insights were presented and discussed primarily with the design and technical teams, the sustainability teams and the communication teams of the respective companies through a series of workshops. Additionally, the outcome has been presented at a series of publicly available webinars throughout 2020 and 2021 where more than 150 SMEs have taken part.



## STUDY AND RESULTS

### **MAPPING OF RESALE; GANNI AND BY MALENE BIRGER**

*For the mapping of the resale market the following studies were conducted:*

- A. Observation of 36,000+ active GANNI and By Malene Birger sales ads.
- B. Monthly Trendsales control, including GANNI and By Malene Birger sales ads count.
- C. Registration and analysis of 20+ selected GANNI and By Malene Birger products, focusing on resale price, product condition, sizing, season and availability.
- D. Identification of 'super reseller' product examples through registration of GANNI and By Malene Birger searching ads.
- E. Six so-called wardrobe studies of experienced GANNI resellers identified on Trendsales, Instagram and Facebook in their private homes or on Zoom lasting 60 to 90 minutes.

In addition, the researcher was based physically at the premises of CF in a period of altogether 16 months with access to data, observations and continuous validation of findings<sup>2</sup>. A series of employee workshops were conducted with CF and the sustainability, design, sales and communication teams of GANNI together with representatives from the top management.

There were more interesting findings in the mapping of consumer-to-consumer resale of GANNI garments. Firstly, the GANNI GIRL phenomenon, which has established the brand as hugely popular in DK and abroad, turned out to be thriving in the resale sector. In fact, the DK-based resale platform Trendsales, which is the largest consumer-to-consumer platform for second-hand apparel in Denmark, has reported GANNI as the absolute winner in its top 20 list of popular brands. In 2019, the number of searches for GANNI products more than doubled compared to searches for the second most popular brand (Trendsales, 2019). According to the mapping of the research conducted, a daily minimum average of 100 GANNI ads was created on the platform with an average resale price of DKK 650. As an example, on 20 November 2020, 20,500 GANNI products were available on Trendsales. Based on the average resale price of DKK 650, this amounts to an estimated total value of DKK 13,325,000 in available second-hand GANNI products. A similar search on 16 March 2021 resulted in 24,000 active ads with GANNI products on Trendsales, which indicates that the market is expanding. A parallel level of activity was found at other physical and online resale platforms such as physical commission resale shops in DK, Vestiare Collective, Facebook and the like. Here it was found that some items were sold from 40% up to 100% + of the original retail price years after it was first introduced as a new style. In summary, it seems that some GANNI GIRLS are highly circular but that GANNI as a brand is currently not earning one single DKK of the revenue streams of the resale that is taking place.

---

<sup>2</sup> Before entering this project, the researcher completed her internship at CF from September 2019 to December 2019. She has been working there part time throughout the project period.

The research team was very interested in the drivers for reselling and purchasing pre-owned clothes and therefore did wardrobe studies with six active resellers of GANNI located at various resale platforms. These respondents are 17 to 43 years old and belong to different demographic groupings but share that they are very active on resale platforms, particularly engaging with GANNI products. The team interviewed these respondents in their homes or on Zoom about their own wardrobes and how GANNI garments went in and out of their personal garment collections through purchase and resale. The team looked at various parameters of the garments present in the respondents' homes such as fit and sizing, style and season, but also discussed how the respondents carried out their resale practices, what was important for them, and what they saw as essential to notice in order to succeed as a reseller. Though the respondents differed in terms of age and other parameters, some elements were characteristic of their experience of good resale practices:

- They acted as a sort of 'resale business' who targeted and understood their audience.
- They provided good customer service in terms of parameters such as fair prices, flexibility, product trial, pick-up meetings or shipping.
- Several of the respondents spent a lot of time to carefully wrap and personalize their sold products to create closer bonds between themselves as a 'resale business' and their target audience.

On top of this, the respondents were very sensitive to various parameters such as changes in the weather, condition (new or used), availability (rare or widespread), hype and exposure, but also to new GANNI collections. An obvious synergy was present, in fact, in all the observations made in the research period between new,

seasonal collections, and the value of products at the resale market that were similar to the new styles presented. Furthermore, it was interesting to notice how their purpose and drive was not only to earn money, but to make room in their closets. In this respect their strategy as resellers could be defined as 'buy-to-sell and sell-to-buy'. This made it possible for them to have a constant flow of new, inspirational styling opportunities which again allowed a very playful engagement with their wardrobes.

These insights to a large extent questioned whether the optimal circular strategy for GANNI was the already established rental service. When comparing prices from the GANNI REPEAT rental service with resale prices on the secondary market, it made sense that the rental offer had not been overly popular. In fact, what appeared was that some consumers had a very good sense of what to purchase in order to resell at a good price, and thus they practically 'rented' the garments for shorter or longer periods of their own choice. For example, a dress was bought, tried on and did not work out, and was sold again four hours after for a little more than what had been paid. Others would have and wear a garment for much longer periods and resell with a potentially rather small loss, thus having 'rented' this garment for a year for a few hundred DKK. These people know the market demands of the resale market intimately and know when to buy and when to sell exactly the right garments at the right time. They know how to put hyped garments on offer in synergy with new collections, and they know that when it starts raining, they will be able to sell the right pair of boots within a short time for a good price. It was findings such as these that showed the GANNI team, the team at CF and the research team that the resale market is driven by entirely different dynamics than the primary market. On the basis on this, GANNI REPEAT is now in transition to resale on top of rental because it is more adaptable to their brand. There has also been a heightened focus on the fact that there needs to be much more synergy between the communication of new collections and resale in the future.

In the case of By Malene Birger and their rental platform RENT THE LOOK, as part of CF fieldwork was conducted through observations and interviews at the By Malene Birger flagship store in Copenhagen in the fall of 2019 and similarly at physical and online resale platforms in the fall of 2020. These insights were interpolated with the findings of the GANNI project and data from the CF rental system. This clearly indicated that at present the rental market for BMB consists of mainly Zealand and Copenhagen (partly Sweden and the remaining DK market), and that it is tightly connected with participation in social events. Thus, it was clear from the CF data that the rental activities fell dramatically during the 2020 Covid lockdown. Also, it appeared from the data that popular rental items are styles that are festive and available in more sizes, so they adapt to a more mature segment, whereas there is little activity with regard to showpieces in sizes XS/S from runways that are typically highly expensive and spectacular in terms of aesthetics. In short, it seems there is a very promising market for rental and resale of dresses for special social events (weddings etc.) for BMB that should be explored further in the future.



---

An experienced reseller stacks items from her own wardrobe that are currently in high demand on the resale market and predicted to maintain their value over time.



---

For experienced resellers, purchasing items in high demand is perceived as risk-free. By following fluctuations in market value of given brands and products, they can estimate resale values and purchase items with little or no economic loss. Here, an experienced reseller shows three dresses she owns with the same style number but in different colours/variants.




**Vestiaire Collective**

Men We Love Vintage Bags Watches & Jewelry Children Express Delivery Direct Shipping

# Ganni

SPRING SUMMER 2020 MAXI DRESS



Price: ~~DKK 1.699~~ **DKK 1.277** (August 2020)


36 IT Size guide  
Never worn More info  
Other Cotton

IGI Direct Shipping  
Get your item's journey in real time on IGI and IGI may apply. Locations

**trendsales**

Seersucker Check Maxi Dress

**Ganni kjole**



RENTAL PRICE: 1.000 DKK  
COLOR: 38 40 42  
SIZE: 38 40 42  
RENT PERIOD: 1 week - 259,00 DKK, 2 weeks - 358,00 DKK, 3 weeks - 517,00 DKK

Om denne vare  
1.000 kr, 314 kr, 1.000 kr

GANNI Seersucker Check Maxi Dress	
Original Retail price:	DKK 1.699
Rental Price for 1-3 weeks:	DKK 259-517
Sold at Price on Vestiaire Collective:	DKK 1.277 (August 2020)
Resale Price on Trendsales:	DKK 1.000 (November 2021)

<https://repeat.ganni.com/dk/en/seersucker-check-black-maxi-dress-4958/?id=089>  
<https://www.vestiairecollective.com/women-clothing/dresses/ganni/cotton-spring-summer-2020-ganni-dress-11547850.shtml>  
[https://trendsales.dk/c/20652394?trigger=main\\_feed](https://trendsales.dk/c/20652394?trigger=main_feed)

A minimalistic wardrobe where garments of high value are continuously recirculated. Due to the limited time of ownership, the relationship between active resellers and their garments practically resembles a rental relationship.

The image shows selected purchasing options of a GANNI Seersucker Check Dress. As it appears, the Original Retail Price is 1.699 kr., while the rental price is 259 kr. for 1 week, 358 kr. for 2 weeks, and 517 kr. for 3 weeks. The dress was for sale on GANNI.com in May 2020 and sold on Vestiaire Collective for 1.277 kr. in August 2020. In November 2021, the dress is available for a resale price of 1.000 kr. on Trendsales. These purchasing options and price examples indicate why it is not necessarily beneficial for consumers to rent items. Instead, they can buy resale versions of items in high demand, own and use them as long as they please, and resell them again when the availability is limited, and demand exceeds the supply.



Picture from the exhibition '70% less CO2' at The Royal Danish Academy where research assistant Asta Baggesen and lecturer Hanne Frederiksen from RDA showcased the grading of a classic GANNI dress from size 36 to 52. Lecturer Malene Kristiansen from the RDA also displayed her work on print and sizing conducted together with the GANNI design team.

Exhibited grading from size 36 to 52 of a classic GANNI dress to show where issues arise and how to tackle them when working towards more size-inclusivity as a fashion brand.





## **THE FIT AND SIZING PROJECT; GANNI AND BY MALENE BIRGER**

During all of the above-mentioned mapping, close observations were made with regard to design preferences and issues of fit and sizing. At present, valid research is being collected pointing to the huge problems within this area in the fashion sector where studies show that up to 98% of customers are dissatisfied with the sizing and fit available (Klepp, Laitala & Hauge, 2011). FDIH (United Danish Online Trade) estimated in 2019 that 58% of returns are due to fit and sizing issues (FDIH, 2019). Furthermore, previous research indicates that designers are designing for their own bodies, and if this is not taken into consideration in the design department many body types are even further excluded (Ræbild, 2014).

However, those studies represent findings on the sale of new garments. So, how is the situation in the resale market and how does it impact the valuation, pricing and performance of garments among consumers? And what is the synergy between design development of new collections and what is being sold on resale platforms? This is what we investigated in the 'Fit and Sizing Project'.

*For the 'Fit and Sizing Project' the following studies were conducted:*

- A. Observations and interactions with the GANNI design team through a twelve-month period.
- B. Try-outs of fit and sizing issues of GANNI styles on employees of the design team.
- C. Prototyping, iterating and coding of selected styles for more body inclusiveness.
- D. Development of recommendations for sizing schemes and collection building strategies for the GANNI design team.

- E. Prototyping of print techniques for body-inclusive fit and sizing.
- F. Qualitative interviews with Danish plus-size fashion brands on body-inclusive design strategies.
- G. Observations and interviews from physical and online platforms for new and resale garments from By Malene Birger.
- H. Observations of sizing and fit issues in relation to the conducted wardrobe studies of experienced GANNI resellers.

In addition, a series of employee workshops with knowledge sharing was conducted with the design and production teams at GANNI and By Malene Birger as well as with the GANNI sustainability team and top management.

In the project conducted together with the GANNI design and technical team, a describing headline was to look at other bodies – and to think about them. As the data shows, GANNI is just one example of the way in which standardized sizing schemes within the fashion sector are currently very body-excluding. That said, it was interesting to dive into this particular design universe and take a closer look at various parameters of design development taking place. A key element of the research was to make members of the design team and other GANNI employees try out their own design. Selected styles were picked out and tried on, documented and discussed among the researcher and key design team members. What quickly emerged was that, firstly, there were several issues with both fit and style that were not very adaptable across sizes (going from 34 to 44, which are the standard sizes of most fashion brands today). Furthermore, there were issues with the pattern construction and fit even if the style was tried on a body with standard

measurements. For example, lack of ease around the body, gaps in the waist across the back, and issues around the armholes preventing optimal movement of the body. Based on this, selected styles were transformed into toile prototypes in more sizes, so that adjustments could be tried out that could leverage the various challenges. As a result, smaller adjustments with huge effect were made to the fit & measurement charts, including a graduation of sizes which was tested out with suppliers. This also affected the whole approach to building up the individual collections, where more body-inclusive styles were being incorporated.



---

Checking gradings by comparing sizes 36 and 42. By comparing two employees from the GANNI design team wearing the same dress, it was possible to assess how to move forward to improve the fit and making it more body-inclusive through simple but effective adjustments of the existing fit and sizing schemes.

---

Fit try-out from sizes 34 to 44. In accordance with the headline *to look at other bodies - and to think about them* from The Fit and Sizing Project, staff from GANNI tried on their own styles to test fits on different bodies.



A key takeaway was, not surprisingly to the research team, that a much closer collaboration is needed between the pattern cutting technicians and the designers right from the beginning of the design development phase. It was not a surprise, since there is well-documented research about how the disconnect between technical skills and design skills going back to the outsourcing wave of the late 1980s has created a loss of both know-how and innovation (Rissanen, Grose & Riisberg, 2018). Another key takeaway was the need to develop and build new styles from well-functioning basic patterns that are tested thoroughly on more body types and sizes, which is not the way things work in most design teams today.

As a supplement to this work, a parallel project was conducted, investigating the consequence of these design choices with regard to print. Currently, a widespread practice is to scale up patterns from the smallest sizes (typically size 34) to the largest (typically size 42) without altering the proportions of the fit in a garment. However, when the size and the proportions of a garment are changed, it affects the perception of the print. Through interviewing and studying a series of DK plus size brands including *Zizzi* and *Masai*, insights were gained to inform design principles for size ranges and various body types that were tested on digital and physical prototypes for further development.

In the conducted wardrobe studies and observations from CF's data and physical and online resale platforms, there were also findings relevant to fit and sizing issues. Here it seemed these matters were less important due to the more playful practice of buy-to-sell and sell-to-buy performed by the resellers. Thus, garments were purchased even if in wrong sizes just to see if potential issues could be solved through styling. If this was not the case, these garments were typically resold without much economic loss, if any, the only investment being the time used for shipping and transaction. This is, of course, based on very limited data, so there could be less fortunate resellers who are more sensitive to fit and sizing issues, since they are not necessarily able to recover their economic investments through a quick resale. It could also be the case that this is a

particular practice related to GANNI products, since By Malene Birger consumers were much more occupied with fit and sizing issues, perhaps due to the age difference between the core consumers of these respective brands. It would, therefore, be commendable to investigate this further in a brand-specific context.



Corrections to a classic GANNI shape. By testing classic styles on several body sizes and types, brands can make a library of thoroughly developed patterns to be guiding designs in the future.



Technician and designer working together on a new collection. In order to improve the product quality and ensure that styles are adequately produced, close collaboration between the two from the onset of the developing phase is crucial.

TAKE-BACK OF TEXTILES:  
DESIGN FOR CIRCULARITY  
IN DENMARK



# INTERIOR DESIGN



# INTERIOR DESIGN

The field of interior design is of a very different nature than the area of fashion in terms of product development, production as well as global dissemination. First of all, the companies represented here conduct much or, in some cases, all product development and production inhouse in DK, while the fashion sector has been outsourcing most of these processes since the late 1980s. This means that within the interior design sector textile knowledge and skills have remained in the country to a much greater extent. This is necessary, since products such as, in this case, furniture textiles and carpets, are generally developed to last much longer than fashion products. As was said at one meeting during the project, “a luxury carpet will not be discarded after having been used once or twice, as is the case with many dresses”. The product guarantee lasts much longer, and products are generally more expensive, which raises the expectations for usability and strength.

However, there are still many bottlenecks for a circular transition, and the project showcases such examples. Looking deeper into the case of carpets there are strict fire regulations that require special treatments and components such as glue etc. that can be difficult to work with in repurposing initiatives. The other is the logistics after first use, which severely complicates take-back schemes, as most Danish-produced carpets are exported to all parts of the globe to hotels, cruise ships etc. In the case of textiles for furniture, these are typically adapted to a particular collection range with B2B purchasers, which means that deadstock represents a relatively large unused resource. In this case, too, once sold and implemented in the final design, products will be disseminated widely outside Denmark.



A shared challenge for both cases in the project is various types of chemical treatment that are applied in the use phase, as these are typically products that cannot be washed in washing machines or laundries. This means that there is little control of what has happened with these textiles, what types of chemicals they have been subjected to and still hold. Hence, it becomes very difficult to build take-back schemes and design for repurposing strategies and at the same time abide by various regulation and certification schemes.

Finally, there is the question of what is taken back from where, and for what purpose. These cases represent design for repurposing through non-wovens, based on shredded textiles. However, the discussions brought many more opportunities up for debate that will hopefully become a reality in the future.

### **DESIGN STRATEGIES FOR TAKE-BACK OF CARPETS** **Dansk Wilton, Ege Carpets**

#### WHO

Dansk Wilton is a DK-based carpet brand situated in the city of Herning and founded in 1953 by Johannes Jensen. Since the 1970s large segments of the brand's core customers have been luxury hotels and cruise ships. Their products are custom-made and of high quality. Dansk Wilton has assembled all its research and design development and the entire production process under one roof at the company's premises in DK. Initially, this project also included Ege Carpets, who is partially operating in the same market and under similar conditions. Hence, some of the insights gained are from a series of workshops where both companies took part in discussing challenges for circularity and take-back in this sector.



The research was carried out by Gabriella Constatinou, a trained textile designer, who has worked with repurposing of carpet textile waste during her training at Design School Kolding. She was employed at the Royal Danish Academy throughout the project but conducted her research in-situ at Dansk Wilton as well as at Lifestyle and Design Cluster (Herning and Copenhagen).



Dansk Wilton's position in the Take-Back of Textiles project framework. Strategic designing to produce for take-back or take-further services. The project focuses on design development based on textile waste from carpets, e.g., production leftovers, in Denmark.

## CONTEXT AND RESEARCH PLAN

As cruise ships sail all over the world, logistics are highly complicated, so embarking on take-back schemes is a vast task that will entail substantial work before it can be successful. And as the workshops showcased, take-back might not always make sense in this area the way these logistics presently function. Since we are dealing with a luxury industry, there is a rapid use phase of 5 years on average since everything needs to always look new and luxurious. In refurbishments on cruise ships the carpets are often dismantled far away from Denmark. Thus, it makes little sense from an environmental perspective to bring them back to Denmark for repurposing. Furthermore, when the carpets are dismantled, there are severe barriers for taking them back due to regulations on the transportation of waste across borders. In many ways a locally based solution to the reuse of carpets will be the most feasible.

The shared discussions, therefore, involved questions of designing for take-back or what we termed *take-further*. One focus was the glue components and the underlay which could be developed and designed for more easy dismantling processes. However, it seemed this would require substantial development work. It was also discussed whether product development could lead to products that could be sold and utilized in other areas of design, perhaps even lead to new, circular business enterprises in the areas where they are dismantled, as for example the Bahamas. It seemed there was a longer range of possible pathways for take-back or take-further in this sector that would all require substantial research both at the technological and the design level. In order to focus the project within the timeframe available, it was decided to only conduct design development based on textile waste of carpets, such as production leftovers, in DK.

The aim was to experiment with design opportunities for utilizing these resources optimally and returning them to the loops of the company's revenue stream. Here the specific issues related to fire retardants and surface treatments were investigated to ensure they



meet the requirements in the market and minimize environmental harm of both the repurposing processes and the final, repurposed products. These activities were carried out together with Dansk Wilton during the fall of 2020.

## STUDY AND RESULTS

*For the design research work in this project the following objectives were investigated:*

- Investigation of design opportunities/barriers with regard to fire retardants
- Investigation of design opportunities/barriers with regard to surface treatments
- Design development work and strategic collection work for take-back
- Mapping of possible collaborate partners for a new take-back collection
- Mapping of potential scope and business model for repurposing carpet waste

The research work is based on an investigation of the opportunities for transforming carpet waste into new, innovative materials through shredding.

In the research it was important to look into the legal requirements pertaining to different products and materials in regard to fire regulations. For this work various fire retardants were mapped and investigated. Three prototypes of boards from carpet waste with different amounts of fire retardant were fire tested in the smithy of Dansk Wilton's own research lab. In the research phase fire retardants were investigated for their environmental impact and for their properties, both regarding the production process and the final product. Further, possible surface treatments were mapped and



investigated through desk research. The time and framework of this project did not allow for any testing of possible surface treatments. Additionally, in this investigation phase, the environmental impact and the properties of various solutions were mapped.

The research on fire retardants and surface treatments was followed by a design development phase seeking optimal design opportunities for the textile boards within related areas of interior design. This included design suggestions and research into potential opportunities for shaping and colouring the repurposed textile boards.

The next phase was to investigate production opportunities in DK for both prototyping and manufacturing of products. The result is a list of potential partners for this segment once testing and further design development has reached this stage. Finally, the research examined the market of existing products which included investigating price points, value propositions and sales platforms (B2C, B2B or web shop).

During the research phase a series of 6 prototypes were finalized and are now being tested and developed further for production and market introduction. A suggestion for a strategy and a five-year plan for the commercialization of the concept has been developed; however, the implementation depends on the test results and further product development. The insights leading to these prototypes have been widely disseminated at publicly accessible webinars and further work within the framework of LDC.



1

1. Gabriella Constatinou, Research Assistant at RDA, in a creative prototyping process at Dansk Wilton.



3



2

2. Knowledge sharing based on research and design development between research assistant Gabriella Constatinou and the Dansk Wilton design team.



4

3. Based on research and design development (i.e., prototyping), the project at Dansk Wilton included design suggestions with regard to shaping and colouring of repurposed textile boards. All research work conducted by Gabriella Constatinou, research assistant at RDA.

4. Throughout the project on design strategies for take-back of carpets, the researcher worked at Dansk Wilton, which ensured close collaboration as well as continuous discussions around results and their potential implications.

## RECOVERY OF NON-WOVEN FIBRES IN FURNITURE

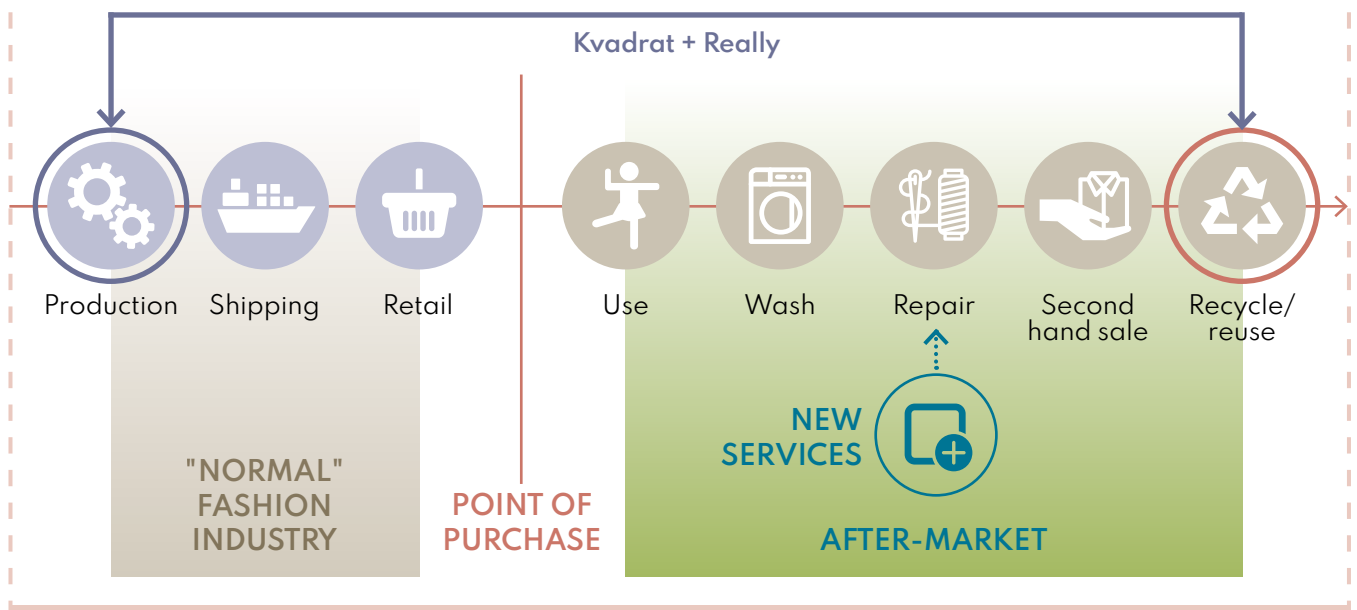
**Kvadrat + Really-CPH**

### WHO

Kvadrat is one of Denmark’s most established and innovative textile brands with a strong international outreach which specializes in high-level design solutions within architecture, furniture and interior design. It was established 1968 and is based in the city of Ebeltoft.

Really-CPH is developing design-based solutions for fibre waste, so far with a specific focus on non-wovens such as boards and felts utilized for custom-made solutions for primarily design brands (both fashion and interior design). The company is partly owned by Kvadrat.

The research was carried out by Astrid Tolnov, who is currently a PhD fellow at the Royal Academy of Art with the project title: *From Fibre to Complex 3d Form -- Recycling and Utilization of the Design Qualities of Textile Fibres for Interior Design.*



### FASHION SERVICE SYSTEM

Kvadrat + Really-CPH's position in the Take-Back of Textiles project framework. Strategic design for take-back services/new ways to utilize textile fibres for interior design.



## CONTEXT AND RESEARCH PLAN

Preliminary studies carried out through the PhD project emphasize that there are certain challenges in the design process of non-woven materials, where the starting point is recycled textile fibres. Firstly, prefabricated non-woven materials of recycled textile fibres, whether it is mats, boards or sheets, tend to overlap and/or pull apart, leaving holes and/or varying density of the material/object when shaped into complex 3D forms. Secondly, a design process of prefabricated (non-woven) materials often requires post-processing, which leaves process waste in the form of off cuts and fibre dust by e.g., sanding or cutting. Thirdly, additives such as glues and screws are often used when the material/product is to be assembled, which presumably complicates a new recycling process. Fourthly, the most widely used non-woven technologies such as airlaid, wetlaid and spunlaid may appear limiting in the artistic development, as the technologies are basically designed to produce homogeneous material outputs.

*The experiments/trials of the ongoing PhD project are therefore based on the following hypotheses:*

- A. The use of loose fibre-blends in the manufacturing process of three-dimensional objects enables more complex designs than in the case of prefabricated sheets, mats or blocks, and the waste material can be significantly minimized, since the objects do not have to be further processed to the same extent.
- B. A manufacturing process where loose fibre blends are the starting point for the design process will form the basis for more artistic design processes than using the non-woven technologies airlaid, wetlaid and spunlaid, which opens up a wider range of options where the design qualities of the textile waste can be utilized.



- C. The use of existing colours in the textile waste can function as a means of expression in the design of the material/ design object and at the same time contribute to reducing the overall environmental impact, as additive resources such as chemicals, water and colour can be eliminated completely from the process.

Through LDC's take-back activity, the PhD project has been linked to the Danish companies Kvadrat and Really CPH, which are currently working on the pilot project *Second Life for Discontinued Samples* (SLDS). The purpose of linking the PhD project and SLDS is to form a common knowledge base for how textile waste (from Kvadrat) can be included in new take-back systems and how textiles can be transformed into innovative product concepts. This body of work will all be included in Astrid Tolnov's ongoing PhD dissertation that will be publicly defended at the Royal Danish Academy by 2023.

## STUDY AND RESULTS

Studies conducted in connection with the take-back project have included visits to companies that possess state-of-the-art knowledge and technologies in the field. This applies to the companies Convert (DK), Really-CPH (DK), Kvadrat (DK), Danish Technological Institute (DK), The Loop Factory (SE) and Fiber Engineering (DE). The visit to Convert was initiated by Really-CPH, which held a two-day workshop for interior and display designers from the H&M group. The primary purpose of the workshop was to give the designers insight into the aesthetic possibilities of processing Really-CPH's *Solid Textile Boards*, and to forward knowledge on how the H&M group can convert its own textile waste into new materials for interior design in shops worldwide. The workshop provided knowledge and better understanding of the airlaid technology and the manufacturing process of Really-CPH's *Solid Textile Boards* and the design possibilities that this specific technology offers.





In order to expand the understanding of how other non-woven technologies work in practice, and how more complex forms can be created from recycled textile fibres, a visit at Fiber Engineering in Karlsruhe (DE) was established. In 2013 Fiber Engineering, innovated and patented the *Fiber Injection Molding* technology (the FIM-line), primarily for manufacturing of insulation materials for the automotive industry. The FIM technology (also known as the air-blow technology) is engineered to downscale the volumes of manufacturing waste by blowing loose fibre-blends directly into various types of press moulds by the use of air currents only. The fibres are then heated and compressed to obtain the intended properties. Since the materials are mostly intended to be hidden behind interior cladding, Fiber Engineering does not, by any means, utilize the design opportunities already inherent in the technology. Thus, the technology leaves untapped potential that only waits to be explored in a design context and therefore becomes the starting point for subsequent material and design trials.

During the work with the take-back project, in collaboration with Egon Förster, founder and CEO of Fiber Engineering, the researcher has designed and developed a portable fibre-blow unit; the first trials will be performed in 2021. The aim of building the portable fibre-blow unit is to facilitate easy access to the FIM technology as well as creating a free and unobstructed space where there is room to experiment, fail, think and create new material/interior experiences.

Other take-back activities include a carpet workshop at LDC in Herning with focus on discussing and finding possible solutions to some of the challenges the Danish carpet companies Ege Carpets and Dansk Wilton are facing when designing take-back systems and recycling processes, as well as participation in a partnership meeting on circular economy and take-back of textiles in BLOX HUB (Cph). During the partnership meeting, the PhD project and the collaboration with Really-CPH and Kvadrat were presented, which resulted in constructive knowledge sharing and discussions with the other participants as well as an invitation to the Danish Technological Institute and its fibre lab in Taastrup.

The take-back activities have contributed to expanded networks, a better understanding of how the contemporary non-woven industry works and how textile fibres can be considered and utilized in new contexts. Thus, joining the LDC take-back project has also provided evidence for the PhD project's hypotheses and thus formed the foundation for how physical trials and experiments aimed at both the PhD project and SLDS can be conducted.

1. Selection of discontinued textile samples from Kvadrat, first trial. The samples are collected from Kvadrat's customers and subsequently sorted into four colour categories by Really. The sorted textile samples in the picture are a snapshot of the first batch collected. The picture clearly shows the inherent complexity found in this waste fraction and also points to the challenges Really faces in the development of highly consistent aesthetic products.



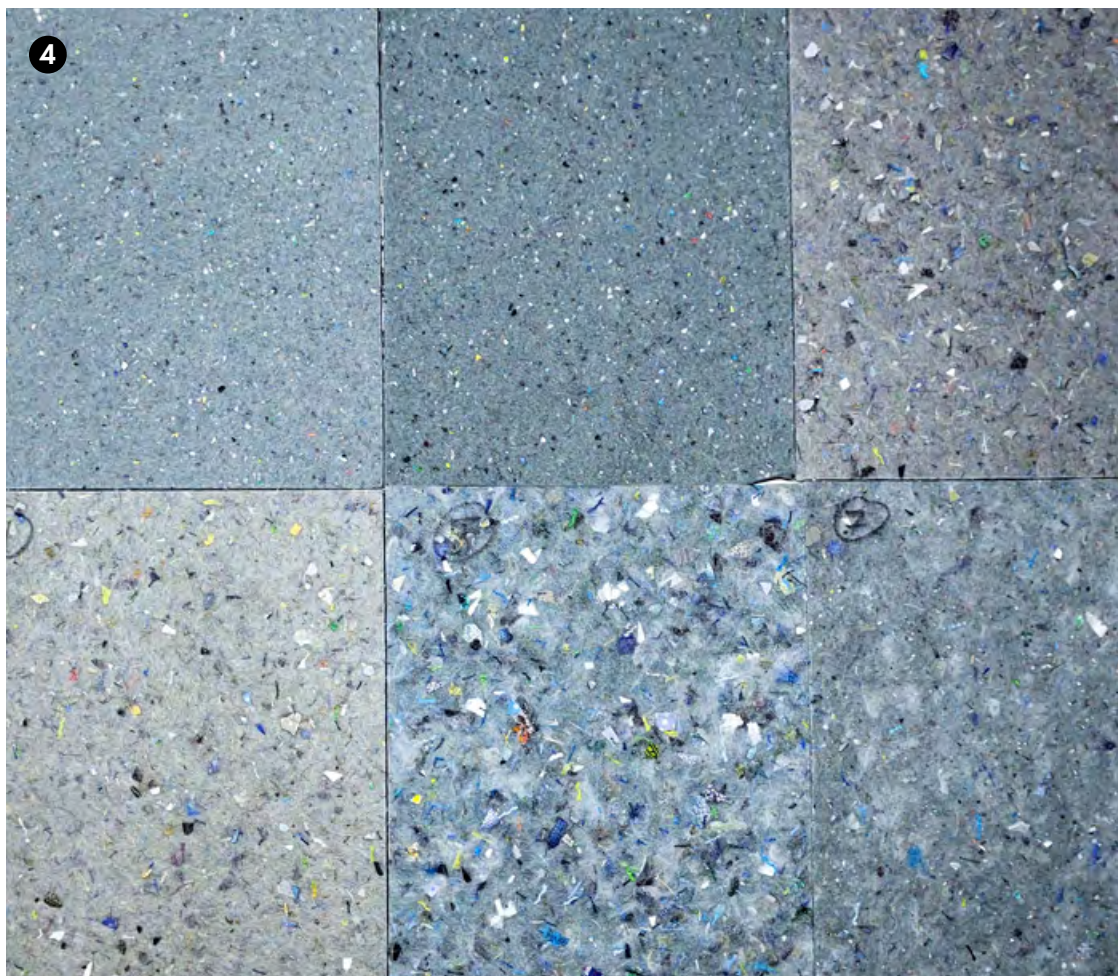
2. Batch of discontinued textile samples from Kvadrat shredded into 5 mm fibres. The discontinued textile samples are milled into varying fibre lengths all between 5 and 15 mm. This is done to research what happens with design qualities and material properties when this fluctuating waste stream is milled.



3

3. Some of the collected, discontinued samples are manufactured with varying backing materials. In the milling process of the samples, the backing appears as flakes which in the finished felt material will stand out as sprinkles spread over the material. As part of the design process, the backing has been separated from the textiles via air currents with the aim to create a more homogeneous expression. This process leaves the backing as a new waste fraction that potentially can be included in other recycling processes and materials or as a design element in other felt products.

4. First trials of felt utilizing discontinued samples from Kvadrat.



TAKE-BACK OF TEXTILES:  
DESIGN FOR CIRCULARITY  
IN DENMARK



# PROJECT INSIGHTS AND RECOMMENDATIONS

for Further Work



# PROJECT INSIGHTS AND RECOMMENDATIONS

## for Further Work

This report has showcased a few examples of barriers and potentials for design-led circularity in Denmark. Circular business models and design strategies are generally quite underdeveloped, and that is exactly what the cases demonstrate – that even in some of the most forward-thinking design companies in Denmark, a fixed solution is still a very distant prospect.

Working on a project with different types of design products created an awareness of strengths and weaknesses at many levels, with various synergistic effects. First of all, the dialogue between the four respective case studies of fashion, workwear, carpets and furniture brought to the participants an awareness of their unique position in circular transition work. But it also became clear that many of the issues discussed were shared concerns of how to move earning opportunities into the secondary market, within the currently very linear business environment. In short, how is it possible to turn the unfortunate overproduction and overconsumption of today into a resourceful business of tomorrow – and how can designers help to accomplish this? Below are some inspiring recommendations that can hopefully spur debate within the industry, education and beyond.



## FASHION



- Design for circularity requires close collaboration between the design team and the technical team, as it is basically a matter of designing garments that fit well both in size, body type and use relevance according to the customer segment of the individual brand. These are the garments that are rarely returned in first sale and maintain their value both economically and emotionally in a circular business model.
- In order to ensure long-lasting performance of fashion products, it is necessary for brands to investigate who their customers really are, and how their products are being valued in use. A good place to investigate this is in the secondary market, or via customer interaction and community building on social media.
- The resale market responds to segments, season and pricing just like the traditional market. But the mechanisms driving it are totally different. Moving into rental or resale requires a close monitoring and analysis of product performance and platform presence (how much are products worth post seasons, and where are they found?).



## PROJECT INSIGHTS AND RECOMMENDATIONS FOR FURTHER WORK

### INTERIOR DESIGN

55



- Textiles for interior design are generally of a very high quality in terms of strength and use performance. However, take-back schemes only work if an actual market is located for repurposed products. One first move could be to revisit existing customers and locate new opportunity spaces.
- Design for circularity requires technological solutions for handling repurposing with regard to, e.g., glue components, fire retardants, control of chemical treatments during use, and control mechanisms or technology to ensure product regulations and certifications when the product journey is uncertain.



## PROJECT INSIGHTS AND RECOMMENDATIONS FOR FURTHER WORK

### SHARED

56



- Design for circularity requires design aesthetics that counter the idea that design is only good if it looks new and if a collection consists of products that look exactly alike.
- Design for circularity is not only about repurposing fibres. The real value and opportunity space lies in considering from the start how products should be developed for long-lasting performance on the secondary market.
- Design for circularity requires much more attention to the value creation in the use phase than what is the case today. Circular products are products that are worth circulating.
- Design for circularity and more resourceful systems and business models is the only viable way to reduce current overproduction and overconsumption that is the root problem to be dealt with in the green transition.







# BIBLIOGRAPHY

---

**DBA & Radius.** (2019). *Genbrugsindekset 2019*. DBA & Radius.

---

**EEA (WRAP & European Environment Commission).** (2019). *Consumer Research for ECAP 2016-2019*. Banbury: WRAP & European Environment Commission.

---

**FDIH.** (2019). *e-handelshanalyse, halvårsrapport 1. halvår 2019*. Accessed from FDIH: <http://www.fdi.dk/analyser/fdih-e-handelsanalyser/ars-og-halvars-rapporter/halvarsanalyse-2019> 31. August 2020

---

**Klepp, I. G., Laitala, K. & Hauge, B.** (2011). Klær for alle? *Skjønnhet og helse: det ytre og indre*. (pp. 71-78). Oslo: ©SIFO.

---

**McRobbie, A.** (2000). "Fashion as a Culture Industry". In S. Bruzzi, P. & Chruuch-Gibson (eds.), *Fashion Cultures, Theories, Explanations and Analysis* (pp. 253-263). Routledge/Taylor & Francis Group.

---

**Ræbild, U.** (2014). *Uncovering Fashion Design Method Practice: the influence of body, time and collection*. Kolding: Design School Kolding & TEKØ.

---

**Rissanen, T., Grose, L. & Riisberg, V.** (2018). "Designing Garments with Evolving Aesthetics in Emergent Systems." "What's Going on?". Global Fashion Conference at London College of Fashion.

---

**Skjold, E. & Steenstrup, J.** (2020). *Klæd dig bedre - en guide til mindre tøjspild og mere garderobeglæde*. København: Gyldendal.

---

**Tænk.** (2021). *Taenk.dk*. Accessed from Forbrugerrådet Tænk: <https://taenk.dk/aktiviteter-og-kampagner/stop-greenwashing-forbrugerradet-taenk-anmelder-5-webshops>. Juni 26, 2021

---

**Trendsales.** (2019). Disse modetrends hittede i virkeligheden i 2019. Accessed from VIA/Ritzau: <https://via.ritzau.dk/pressemeddelelse/disse-modetrends-hittede-i-virkeligheden-i-2019?publisherId=13559614&releaseId=13585566>. November 20, 2020

---

**ThredUP.** (2019). *2019 Resale Report*. ThredUP.

---

**Watson, D., Trzepacz, S. & Pedersen, O. G.** (2018). *Kortlægning af tekstilflows i Danmark*. Miljøstyrelsen.

---

