

THE NORDIC TEXTILE COLLABORATION

Final Report: Results and Recommendations



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This publication is also available online in a web-accessible version at:
<https://pub.norden.org/temanord2024-547>

PREFACE

The Nordic countries are renowned for their product design, focus on quality and innovation when it comes to green and sustainable solutions. Moreover, we have a longstanding tradition of strong collaboration across the Nordic countries where we learn from - and support each other.

All this comes together in The Nordic Textile Collaboration bridging actors and citizens who, in one way or other, take part in our complex textile industry, and sparked important conversations on our consumption, production and waste management patterns. We know that the textile industry bears weight in our climate- and environmental footprint. Creating a forum that recognizes and addresses the challenges of transitioning to a more circular textile industry has been an important feat of this collaboration, giving a platform to a multiplicity of stakeholders who hold crucial knowledge and together, in dialogue and collaboration, can help build the textile industry of the future.

As project coordinator, the Danish Environmental Protection Agency has had the pleasure of establishing and hosting this forum for Nordic knowledge-sharing, collaboration and networking. It has been a very exciting journey with lots of steps and considerations: From mapping circular efforts in the textile industry in the Nordic countries, defining how to collaborate and, very importantly, carrying out selected initiatives involving many different actors and topics. Most of the activities have been conducted online – a format enabling widespread collaboration with citizens, companies and organizations across the Nordic countries, but a format that also has its challenges. Thanks to the openness of participants and the support of great colleagues, we succeeded together.

As you read this report, you are invited to take as many insights with you as possible, to share them, to challenge them, to reach out to those involved and to use them as building blocks for new holistic, transdisciplinary and transnational approaches to reshaping our relationship with textiles.

A big thank you to all those who have made time to participate, those who have facilitated the activities, and those who are reading this report for future knowledge creation and collaboration.

Anne Elizabeth Kamstrup
Deputy Director General
Centre for Circular Economy
Danish Environmental Protection Agency

STATEMENTS FROM THE NORDIC TEXTILE COLLABORATION REFERENCE GROUP:

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The Nordic Textile Collaboration report departs in approaches that are unique and grown from Scandinavian design traditions; for one, the idea that user experiences are important for developing high value design; and secondly, the idea that collaboration and sharing is instrumental in developing new economic models. Despite prior attempts, we have not yet succeeded building a strong Nordic coalition with a focus on sustainable and circular textiles. However, as this report illustrates, it is most urgent that the Nordic countries collaborate and coordinate efforts in a period defined by the largest transition of the textiles sector since the globalization of the 1990's.

Nordic countries share cultural heritage, climatic conditions, industrial history and the idea of the welfare society – even if each individual country has specific strongholds and unique traditions, skills and know-how for textiles. Through coordinating initiatives, investments and knowledge build-up across the Nordic countries, we could potentially revitalize our proud textile sector with particular focus on high value design development and services for prolonging textile resources in our own region. It is therefore my hope that the Nordic Textile Collaboration initiative can help build resilience in times of geopolitical crisis and transition and secure a viable path for the future.

Else Skjold, Associate Professor, PhD in design and sustainability, The Royal Danish Academy, Denmark

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Participating in the Nordic Textile Collaboration has been both enlightening and enriching for NF&TA and the partnership. Through the webinars and workshops, we gained valuable insights into actors within areas such as circular business models and textile recycling. The format allowed us to invite relevant cluster partners to attend the webinars, making the knowledge-sharing highly practical and collaborative. The project has also been a good platform for showcasing innovative actors and exciting new research, as well as building stronger relationships across the Nordic region. Engaging with new Nordic stakeholders has led to more fluid communication and cooperation, with the Nordic Textile Collaboration serving as a common reference point and catalyst for ongoing dialogue, and we will use the report as a reference tool in future projects. Further research into systemic incentives and frameworks that encourage large-scale adoption of circular practices is needed, and we believe that continued collaboration and focus on consumer behavior change is crucial.

Gro Haram, Head of Sustainability, NF&TA, Norway

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Systems change is obtained by addressing three perspectives simultaneously: impacting greater number – scale out, impacting laws and policies – scale up, and impacting cultural roots – scale deep (McConnel Foundation, 2015). This project is an inspiring example of this multi-dimensional approach.

The coming years will be critical for creating the leverage required to change the textile system. This includes both the implementation of upcoming legislation as well as investment in enabling infrastructure to scale circular business models and push for a sustainable consumption. The way forward is spelled collaboration, and the Nordics own a great opportunity to be a leader in this process.

At Science Park Borås we have a strong focus on how development of CBM and changing consumption norms impact each other and drive change. The suggested themes for actions in this report are relevant for this cause. As an innovation actor, we want to highlight the need for accessible testbed environments, focused on enabling value retention in the textile flows and that are open for companies and other stakeholders to partner up and develop new and innovative solutions. Such environments would highly benefit from more Nordic collaboration and knowledge-sharing.

Adrian Zethraeus, Project Manager, Science Park Borås, Sweden

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The Nordic textile collaboration provides valuable insights into the willingness of both consumers and producers to contribute to the reduction of waste and more circularity in the textile sector, and the barriers too. While the report contains many suggestions for actions needed to make the textile sector more circular, we are also very happy to see it being stressed these will only achieve environmental gains, if new production and waste is reduced and the lifetime and use-phase of products is extended.

The report highlights the need to make circular business models and products more competitive and attractive and concrete suggestions for new developments are provided. It would be interesting to also reverse the object of inquiry and thus ask, what maintains the superior competitiveness and attractiveness of the more conventional business models, both in the eyes of producers and consumers? Such an inquiry could reveal what we need less of and hence regulate more, to create space in the market for circular businesses and products.

Lina Katan, Special Advisor, Circular Denmark, Denmark

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By reading this report, one can gain a good general understanding of the various challenges facing the textile industry and the complexities involved in changing the entire paradigm. It is important to adopt a completely different perspective and approach, and to achieve this, we must engage the entire value chain from design and production to the end consumer.

Numerous initiatives are currently underway, with many hoping to contribute to this change. An overview of Nordic sustainable projects identified a total of 148 initiatives. The report states, “However, the identified initiatives were mainly small-scale and nationally oriented.” This finding highlights the need for more effective and extensive knowledge sharing across the Nordics.

In Denmark, we have established the Textile Sector Collaboration to prepare Danish brands for EU legislation and to exchange challenges and experiences related to circular business models. A Nordic initiative would be an excellent way to ensure that knowledge and potential in areas such as technology, design methods, and infrastructure can be shared.

Betina Simonsen, CEO, Lifestyle & Design Cluster, Denmark

EXECUTIVE SUMMARY

The Nordic Textile Collaboration, which ran from 2022 to 2024, addressed the shared environmental and climate related challenges associated with the consumption of textiles in the Nordic countries. The project was launched by Danish, Finnish, Norwegian and Swedish environmental authorities and funded by the Nordic Council of Ministers.

The project started out by mapping sustainable textile initiatives in the Nordic countries to identify knowledge gaps and positions of strength. Findings showed three areas for potential Nordic collaboration in regard to circular textiles: 1) circular business models and consumption cultures; 2) competences and knowledge sharing; and 3) digital tools and communication. These were subsequently formulated into three initiatives: Active Textile Society, Sharing Nordic Circular Competences, and EU & Textile Coffee Breaks.

Active Textile Society focused on the uptake of circular business models and consumption by involving citizens and brands in a six-month challenge. During these six months, participating companies had access to knowledge and inspiration about ways to develop and implement circular business models, while participating citizens were challenged not to buy new clothes, but instead to seek circular business models in society to fulfill their changing wardrobe needs.

Sharing Nordic Circular Competences focused on knowledge and competence gaps related to the circular transition of the fashion and textile industry. The initiative presented participants with cutting-edge knowledge, methods, and tools from Nordic researchers, project managers, and other experts focusing on topics of relevance to the whole value chain, spanning from textile waste to design, production, and consumption.

Both initiatives included a series of webinars and online workshops featuring presentations and discussions on barriers to the circular transition of textiles and ways of overcoming them. Active Textile Society also included surveys for citizens and brands that made it possible to track the progress of their challenge. The surveys provided insights into how circular business models were used and the extent to which they fulfilled citizens' needs.

As an add-on, the EU & Textile Coffee Breaks updated participants on the EU framework they will be working under in the coming years.

Results from the project have been consolidated into a list of actions that, according to participants in The Nordic Textile Collaboration, may help further the development of a circular textile economy. The report presents these actions grouped into three overall recommendations: 1) Support the growth of circular business models; 2) Engage citizens in the circular transition; and 3) Make design for circularity the standard. In this way, the report aims to serve as a reference tool for future initiators of Nordic collaboration on circular textiles.

ACKNOWLEDGEMENT

The project has been coordinated by the Danish Environmental Protection Agency (EPA). The Danish EPA would like to thank all participants and affiliated partners for their great engagement and contributions throughout the project. Without you, there would not have been any project.

We would also like to extend thanks to participating companies in Active Textile Society for delivering exciting pitches and filling out surveys and logs about their work on improving their circular business models.

Special thanks also go to participating citizens for their engagement and willingness to share experiences with prolonging the lifespan of textiles during workshops, and for filling out surveys and logs between the events.

Thanks to all participants in Sharing Nordic Circular Competences for sharing their experiences during the webinars. Thanks to all presenters who have presented their knowledge and research findings at the webinars in Active Textile Society, Sharing Nordic Circular Competences and the EU & Textile Coffee Breaks. We thank the members of the steering committee for helping with the design and quality assurance of the initiatives.

Thanks to the reference group for their help with figuring out the content and format of the activities to make them as relevant as possible for participants across the Nordics, and across the textile value chain.

Thanks to the Nordic Council of Ministers for funding the project and for their valuable guidance and advice.

CHAPTER 1: INTRODUCTION

This report presents results from The Nordic Textile Collaboration, a project launched in 2022 by Danish, Finnish, Norwegian and Swedish environmental authorities. The project addresses the shared environmental and climate challenges associated with the rising consumption of textiles in the Nordic countries, with the aims of:

- Reducing unnecessary consumption.
- Extending the lifespan of textiles.
- Promoting circular business models.
- Strengthening digitalization and traceability in the fashion and textile industry.
- Supporting increased and improved collection, sorting, reuse, and recycling of textiles.

The project is funded by the Nordic Council of Ministers as part of the program *Vision 2030*. The project contributes particularly to the visions for "A green Nordic" and "A competitive Nordic" by promoting circular economy, as well as sustainable and competitive production; activating and involving Nordic consumers, with the aim of promoting sustainable consumption; and supporting knowledge sharing and innovation to fully exploit the development opportunities created by green, technological and digital transformation.^[1]

The Nordic Textile Collaboration is coordinated and carried out by the Danish Environmental Protection Agency (EPA), with guidance from a steering committee consisting of members from Nordic environmental protection agencies, and supported by a Nordic reference group with experts from across the Nordic textile value chain.

About The Nordic Textile Collaboration

Steering committee^[2]

The Danish Ministry of Environment and Gender Equality, The Finnish Environment Institute SYKE, The Norwegian Environment Agency (Miljødirektoratet), The Swedish Environmental Protection Agency (Naturvårdsverket).

Project coordinator

The Danish Environmental Protection Agency.

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1. Find more information about *Vision 2030* in this report: Nordic Council of Ministers (2020) The Nordic Region – towards being the most sustainable and integrated region in the world. Action Plan for 2021–2024. <https://www.norden.org/en/publication/nordic-region-towards-being-most-sustainable-and-integrated-region-world> (accessed 10-09-2024)
 2. The Swedish Environmental Protection Agency was part of the steering committee until February 2023 but had to withdraw due to lack of resources. Subsequently, the Swedish Environmental Protection Agency continued to be available for knowledge sharing and advice and has contributed with valuable input throughout the entire project.

Reference group

Avfall Norge, Avfall Sverige, Brancheforeningen Cirkulær, DAKOFA, Dansk Mode & Textil, Designskolen Kolding, Det Kongelige Akademi, Forbrugerrådet TÆNK, ISOBRO, KIVO, Lifestyle and Design Cluster, NF&TA, Science Park Borås, Suomen Tekstiili & Muoti, Turku University of Applied Science.

Project period

2022–2024

Budget

DKK 9 mil.

Funded by the Nordic Council of Ministers



The project was carried out in three phases:

January – December 2022:

Planning the project, including mapping sustainable textile initiatives in the participating countries (Denmark, Finland, Norway and Sweden) to create recommendations for new initiatives.

January 2023 – August 2024:

Preparing and carrying out selected initiatives based on the recommendations from the mapping.

September – December 2024:

Reporting and disseminating project results.

1.1 Reader's guide

The report presents the content and achievements of The Nordic Textile Collaboration, while also providing an overview of Nordic knowledge and expertise regarding the circular transition of fashion and textiles. In this way, the report shares conclusions and recommendations for promoting a circular textile economy in the Nordics. It also serves as a reference tool for anyone who wishes to get in touch with specific experts and research environments in the Nordics or who wishes to build on existing knowledge and projects when designing new activities and interventions related to a circular economy and textiles.

In addition to the report, the project's results are also available in several other formats on the project's website, including video testimonies from participants, visual highlights, and educational materials, as well as webinar slides and recordings.^[3]

3. The project website is accessible here: <https://mst.dk/erhverv/groen-produktion-og-affald/affald-og-genanvendelse/affaldshaandtering/affaldsfraktioner/tekstilaflald/the-nordic-textile-collaboration>

The report consists of six chapters:

[Chapter 1](#) sets the scene focusing on the current challenges related to the production and the consumption of textiles from a Nordic perspective.

[Chapter 2](#) shares insights gained from mapping existing initiatives in the Nordic countries with an emphasis on how the mapping laid the foundation for identifying and determining the focus areas for the project.

[Chapter 3](#) presents findings from the initiative Active Textile Society, where Nordic companies and citizens engaged in a joint effort focusing on extending the lifespan of textiles. During webinars and workshops about circular solutions, such as repairs, redesigns, reuse and rentals, participants identified barriers to implementing these methods, and solutions that can overcome them. At the same time, participants completed a six-month challenge, which ran from January to June 2024, where companies tested circular business models and citizens used circular solutions in society to fulfill their wardrobe needs as an alternative to shopping for new clothes and textiles. The first part of the chapter provides lessons learned from the webinars and workshops. The second part shares conclusions regarding the journey of participating companies and citizens based on surveys done during the initiative.

[Chapter 4](#) presents key take-aways from the initiative Sharing Nordic Circular Competences. Sharing Nordic Circular Competences established a Nordic network bringing into focus circular design, recycled materials and best practices for collecting, sorting and treating textile waste. The initiative entailed a series of webinars featuring presentations from Nordic experts, focusing on selected themes. The chapter runs through each of the themes, presenting lessons learned from each webinar.

[Chapter 5](#) describes the content and the outcomes of the EU & Textile Coffee Breaks. The EU & Textile Coffee Breaks served as an add-on to Active Textile Society and Sharing Nordic Circular Competences. During short sessions, participants were introduced to the EU framework they would be working under in the coming years. The chapter summarizes the topics raised during the sessions.

[Chapter 6](#) concludes the project and presents recommendations for actions developed by participants in The Nordic Textile Collaboration. The ideas are grouped into three overall recommendations: 1) Support the growth of circular business models; 2) Engage citizens in the circular transition; and 3) Make design for circularity the standard. The chapter presents each recommendation in turn.

1.2 The environmental impacts of fashion and textiles

The textile sector is the third highest source of pressure on water and land use within the EU, has the fifth highest use of raw materials and is responsible for the fifth highest emission of greenhouse gases.^[4] Global textile production doubled between 2000 and 2015, and there is no indication that this development is to slow down any time soon; in fact, this growth is expected to continue through 2030.^[5] While the consequences of textile production are felt globally, the Nordic countries have a significantly higher rate of textile consumption per capita than the global average, with a global production averaging 14 garments per capita annually, while the average person in the Nordic countries purchases between 26 and 48 garments each year.^[6]

4. According to the European Environmental Agency. For more information, see <https://www.eea.europa.eu/en/topics/in-depth/textiles?activeTab=fa515f0c-9ab0-493c-b4cd-58a32dfaae0a> (accessed 10-09-2024).

5. UNEP (2020) Sustainability and Circularity in the Textile Value Chain: Global Stocktaking.

6. The global average is reported in McKinsey Sustainability (2016) Style that's sustainable: A new fast-fashion formula. The Nordic average is reported in Palm et al. (2014) Towards a Nordic textile strategy: Collection, sorting, reuse and recycling of textiles.

Since the start of The Nordic Textile Collaboration, the Nordic countries have furthermore seen a rise in ultra-fast fashion retailers, expected to increase the consumption of consumer goods, including textiles.^[7] Thus, addressing the environmental impacts of the fashion and textile industry is no less important today than when this project was launched.

1.3 The continuous need for Nordic collaboration

While the environmental and climate impacts of the fashion and textile industry were known back in 2022 when the work on this project commenced, the sector had only been subject to national legislation in the Nordic countries to a limited extent.^[8] Since 2022, several legislative steps have been taken in the EU to support the transition towards a sustainable and circular textile economy. With the EU Strategy for Sustainable and Circular Textiles published in March 2022, the Commission presented a vision for textiles that aimed to make fast fashion go out of fashion and instead supported the uptake of durable, repairable and recyclable textiles, as well as circular business models such as repairs and reuse.^[9]

Since the presentation of the EU Textile Strategy two and a half years ago, the Council of the European Union has adopted the Ecodesign for Sustainable Products Regulation (ESPR), aiming to improve the circularity and sustainability of products placed on the EU market.^[10] The ESPR includes the introduction of a ban on the destruction of unsold textiles, as well as a Digital Product Passport (DPP) storing relevant information on products' environmental impact. The current EU Waste Framework directive states that member states should establish separate collection of textile waste by 2025.^[11] The ongoing revision of the Waste Framework Directive includes the introduction of Extended Producer Responsibility, making stakeholders placing textile products on the EU market economically responsible for separate collection, sorting and recycling of textiles (see Chapter 5 for further description of upcoming regulation from the EU). With new regulations underway, it remains crucial and beneficial for Nordic countries to continue collaborating and sharing knowledge and competences. For this purpose, The Nordic Textile Collaboration took the first step in establishing a forum for collaboration and exchange across the Nordics. Hopefully, the project will inspire Nordic stakeholders to continue the journey, making use of results and lessons established in this project.

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7. The rise of ultra-fast fashion retailers has attracted attention among different Nordic observers. See, for instance, Finans (15/08/2024) Temu slår Matas og indtager nu en andenplads over danskernes favorit webshop <https://finans.dk/erhverv/ECE17353550/temu-slaar-matas-og-indtager-nu-en-andenplads-over-danskernes-favorit-webshop/> (accessed 10-09-2024), TEK (19/03/2024) 'Dette bør du vite før du handler på temu' <https://www.tek.no/nyheter/nyhet/i/3EloEX/dette-boer-du-vite-foer-du-handler-paa-temu> (accessed 10-09-2024), Svensk Handel (08/07/2024) Regeringen måste markera mot Temu och Shein' <https://www.svenskhandel.se/nyheter/pressmeddelande/regeringen-maste-markera-mot-temu-och-shein> (accessed 10-09-2024).
 8. See Mapping report, Chapter 3.
 9. European Commission (2022) Strategy for Sustainable and Circular Textiles https://environment.ec.europa.eu/document/download/74126c90-5cbf-46d0-ab6b-60878644b395_en?filename=COM_2022_141_1_EN_ACT_part1_v8.pdf (accessed 10-09-2024).
 10. Read more about the Ecodesign for Sustainable Products Regulation here: https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/ecodesign-sustainable-products-regulation_en (accessed 10-09-2024).
 11. Read more about the EU Waste Framework Directive here: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en (accessed 10-09-2024).

CHAPTER 2: MAPPING SUSTAINABLE TEXTILE INITIATIVES IN THE NORDIC COUNTRIES

This chapter summarizes the results from the first phase of the project, which focused on mapping sustainable textile initiatives in the Nordic countries. More information about the mapping and a full overview of the identified initiatives is available in the report *Mapping Sustainable Textile Initiatives in the Nordic Countries* (2023).^[12]

2.1 The aim of the mapping exercise

To identify relevant areas for collaboration, the first phase of the project concentrated on establishing an overview of existing initiatives on sustainable textiles in the Nordic countries. The aim of the mapping was to identify Nordic positions of strength, and areas already addressed by other projects, as well as key stakeholders within the Nordic fashion and textile sector. Thus, the mapping provided a knowledge base for determining how The Nordic Textile Collaboration could support the transition towards a Nordic circular textile economy during 2023 and 2024.

2.2 The mapping methodology

The project coordinating team at the Danish EPA conducted the mapping in 2022. It commenced by interviewing project steering committee members in Finland, Norway and Sweden to gain insights into the current state of the textile sector in the three countries. Existing overviews within the Danish Ministry of Environment and the Danish EPA were used to get an overview of Danish activities.

Utilizing the knowledge gained from the first step of the mapping, desk research was conducted, drawing on publications, earlier mappings and online project databases on the websites of industrial and trade organizations, national authorities and the Nordic Council of Ministers. Furthermore, trade organizations for fashion and textiles within the four participating countries, as well as the steering committee, were consulted to ensure quality assurance of the findings.

In August 2022, three workshops were held to gather input for the mapping and the formulation of initiatives to prioritize in The Nordic Textile Collaboration. In total, around 100 participants representing trade organizations, recycling and waste management companies, reuse organizations, consumer organizations, academia, NGOs and public authorities, provided valuable input for the project during the three workshops.

12. The report "Mapping Sustainable Textile Initiatives in the Nordic Countries" is available here: <https://www.norden.org/en/publication/mapping-sustainable-textile-initiatives-nordic-countries> (accessed 10-09-2024).

2.3 The mapping results

The mapping focused on collaborative projects initiated by private and public stakeholders that innovate the textile sector as a whole in a more circular direction. Based on this criterion, 148 projects were identified and divided into five categories:

1. Materials and design (41 projects)
2. Production methods (15 projects)
3. Consumption and circular business models (22 projects)
4. Collecting, sorting and recycling (24 projects)
5. Governance and capacity building (46 projects)

The mapping showed that several activities were already taking place that supported the transition towards a circular textile economy within the Nordic countries. However, the identified initiatives were mainly small-scale and nationally oriented. It made sense to join forces, learn from each other and act together for two main reasons. First, the scope of the challenge at hand means that it makes little sense to develop narrow, local solutions. Second, the scale of the Nordic countries and the similarity of their challenges in terms of consumption patterns and meeting the expected legislative requirements of the future provide a great argument for cross-country collaboration. Based on the trends identified through the mapping, there was potential for The Nordic Textile Collaboration to address gaps and build on existing knowledge within the areas of:

- **Circular business models and consumption cultures:** Joint action across the Nordic countries to support the uptake of circular business models and enable consumers to play an active part in the transition by supporting the extension of textile lifespans.
- **Circular competences and knowledge sharing:** Developing green skills and sharing knowledge related to the transition of the fashion and textile industry to ensure that new knowledge and technologies are communicated across the Nordic fashion and textile industry.
- **Collaboration on digital tools and communication:** A Nordic collaboration on sustainability reporting to develop methods for communicating sustainability efforts, in order to support stakeholders within the Nordic textile sector to meet the demands of new EU regulation, such as the proposed Directive on Green Claims.

In collaboration with the steering committee, it was decided to prioritize the first two areas, which developed into the initiatives of Active Textile Society (see [Chapter 3](#)) and Sharing Nordic Circular Competences (see [Chapter 4](#)). As the adoption of the EU Directive on Green Claims was still underway at the time, the third initiative was not prioritized. Instead, it was chosen to include a third initiative, EU & Textile Coffee Breaks, aimed at introducing stakeholders within the Nordic textile sector to the EU framework they would be working under in the coming years (see [Chapter 5](#)).

CHAPTER 3: ACTIVE TEXTILE SOCIETY

This chapter is divided into five sections. Section 3.1 describes the thoughts behind the initiative, as well as its organization. Section 3.2 runs through the different topics examined during webinars and workshops, sharing key take-aways from each of these events. Sections 3.3 and 3.4 analyze the journey of participating companies and citizens based on answers from surveys and logs. Section 3.5 summarizes findings from the initiative as a whole.

3.1 About the initiative

The mapping (see [Chapter 2](#)) highlighted the need to support the uptake of circular business models and enable citizens to play an active part in the transition. Active Textile Society contributed to filling the gap by bringing together companies and citizens across the Nordic countries in a joint effort with an emphasis on extending the lifespan of textiles.

Six-month challenge

The initiative involved a six-month challenge, which ran from January to June 2024. During these six months, participating companies accessed knowledge and inspiration about how to develop and implement circular business models, while participating citizens were challenged not to buy new clothes, but instead to seek circular business models in society to fulfill their wardrobe needs.^[13]

Throughout the six-month challenge, participating companies and citizens met during bimonthly webinars and online workshops on selected themes to establish knowledge and gain tools to achieve the goals of lifespan extension, the uptake of circular business models and changes in consumer behavior (see the webinar program below). The webinars and workshops also served as a platform for companies and citizens alike to exchange experiences and views, as well as collaborate on identifying barriers to using circular business models as well as solutions for how to overcome such barriers. Thus, the activities supported the creation of a social community where inspiration, tutorials and hands-on experiences could be shared.

Program of webinars and workshops in Active Textile Society

GETTING READY FOR THE SIX-MONTH CHALLENGE:

27 September 2023
13.00-14.30 (CET)

Circular business models and consumption cultures (webinar for companies and citizens)

What types of circular business models exists, and how do these relate to existing consumption cultures?

14 November 2023
16.30-18.00 (CET)

Circular business models and consumption cultures (webinar for citizens)

What types of circular business models exists, and how do these relate to existing consumption cultures?

13 December 2023
16.30-17.30 (CET)

Preparation for the six month challenge

How to succeed in the six-month challenge based on lessons learnt from similar exercises.

13. By new clothes, the project refers newly produced clothes. Thus, participating citizens would have to look for alternatives in society, such as second-hand clothes and repair-, remake- and rental services.

COMPLETING THE SIX MONTHS CHALLENGE:

24 January 2024 16.30-19.00 (CET)	Repair, redesign and product care Which methods exist for repair and product care that make textiles last longer, both functionally and aesthetically?
13 March 2024 16.30-19.00 (CET)	Reuse and resale How can reuse and resale of textiles be organized in ways that make these solutions appealing to citizens?
15 May 2024 16.30-19.00 (CET)	Rentals and styling What do we know from wardrobe studies about the user phase, needs and solutions?
26 June 2024 16.30-17.30 (CET)	Evaluation event Gathering experiences regarding barriers and solutions to lifetime extension of textiles.

Surveys and logs

The journeys of companies and citizens were documented using surveys and logs.

Participating companies filled out two pre-surveys during the autumn of 2023 where they took stock of their existing business models and indicated which part(s) they wanted to develop, test or challenge. During the six-month challenge, companies filled in bimonthly logs about how they fared.

Participating citizens started with a wardrobe survey in December 2023 in which they mapped the content and characteristics of their wardrobes. The exercise involved counting all their clothes to get a full overview of what they had, identifying characteristics of most-worn and least-worn clothes in their wardrobe as well as pointing out potential wardrobe needs during the next six months. During the six-month challenge, citizens filled out monthly logs about how they fared, emphasizing what type of wardrobe needs they faced and how they managed to meet such needs.

In this way, the initiative gathered empirical evidence about barriers and solutions to the extension of textile lifespans in Nordic societies, constituting valuable knowledge that is useful when discussing what it takes to move forward with the agenda of developing a circular textile economy.

Participants

The initiative had more than 200 sign-ups, including 2–9 companies and 30–40 citizens from each country. Besides companies and citizens, the initiative enjoyed the participation of various other stakeholders working with fashion and textiles in the Nordics, such as consultants and researchers, who contributed their knowledge and expertise to the discussions. However, the primary focus remained on bringing together companies and citizens, supporting them to complete the six-month challenge.

3.2 Key take-aways from webinars and workshops

Six webinars and three workshops were organized for participants in Active Textile Society:

- Three webinars with six presentations held in the fall 2023 to prepare participants, ensuring a shared understanding of key concepts, such as the basic ideas of circular economy and circular business models (see [sub-section 3.2.1](#)), as well as introducing key figures about current textile consumption patterns in the Nordics (see [sub-section 3.2.2](#)).
- Three webinars with six presentations were held during the six-month challenge (January–June 2024), focusing on selected circular business models, including repair, redesign and product care (see [sub-section 3.2.3](#)), reuse and resale (see [sub-section 3.2.4](#)) as well as rentals and styling (see [sub-section 3.2.5](#)). After each webinar, online workshops were hosted where participants discussed barriers and identified solutions to the different circular business models.

Relevant presenters for the webinars were identified using the mapping report (see [Chapter 2](#)) as well as advice from affiliated partners to the project, including the steering committee and the reference group. All presenters were chosen based on their expertise, their extensive work on the selected topics for years, and their ability to present the latest cutting-edge knowledge. The webinar presentations were recorded and are available on the project website alongside slides from all the presentations.^[14]

3.2.1 Pre-challenge webinars about circular business models

Three presentations held in the fall of 2023 provided a common understanding about the principles of circular business models.

Webinar presentations about circular business models

Circular business models in the Nordics by Kia Egebæk, project manager at the Nordic Council of Ministers' vision project "Product Service Systems in the Nordics". Presentation held on September 27, 2023. Learn more about the project here:

<http://www.pssinthenordics.com>

Textile consumption trends: Mind the gap(s) by Susanne Nejderås, textile strategist at Science Park Borås. Presentation held on September 27, 2023. Learn more about the project here: [https://issuu.com/hogskolaniboras/docs/mindthegaps_230623_final?](https://issuu.com/hogskolaniboras/docs/mindthegaps_230623_final?fr=sNmNIMDUzMjQ5OQ)

[fr=sNmNIMDUzMjQ5OQ](https://issuu.com/hogskolaniboras/docs/mindthegaps_230623_final?fr=sNmNIMDUzMjQ5OQ)

14. Webinar presentations are available on the project website: <https://mst.dk/erhverv/groen-produktion-og-affald/affald-og-genanvendelse/affaldshaandtering/affaldsfraktioner/tekstilaffald/the-nordic-textile-collaboration>

The Circular Toolbox by Gwen Cunningham, project manager at Circle Economy Foundation (presented by Louise Munkholm, project coordinator of The Nordic Textile Collaboration at the Danish Environmental Protection Agency as Gwen Cunningham was unavailable). Presentation held on December 13, 2023. Learn more about the project here: <https://www.thecirculartoolbox.com/>

The following sections summarize key take-aways from the webinar presentations and the workshop.

Take-aways from "Circular business models in the Nordics"

Presentation by Kia Egebæk

In her presentation, Kia Egebæk focused on how to contribute to the extension of textile lifespans from a business perspective. She presented three types of circular business strategies available for the textile and fashion industry, as described by the Ellen MacArthur Foundation:



Infographic developed by Holm Kommunikation based on webinar presentation

The first set of strategies enables *more use per user* by, for instance, designing products to be physically and emotionally durable, providing services that support long-term use, and empowering users to use their products more and for a longer time.

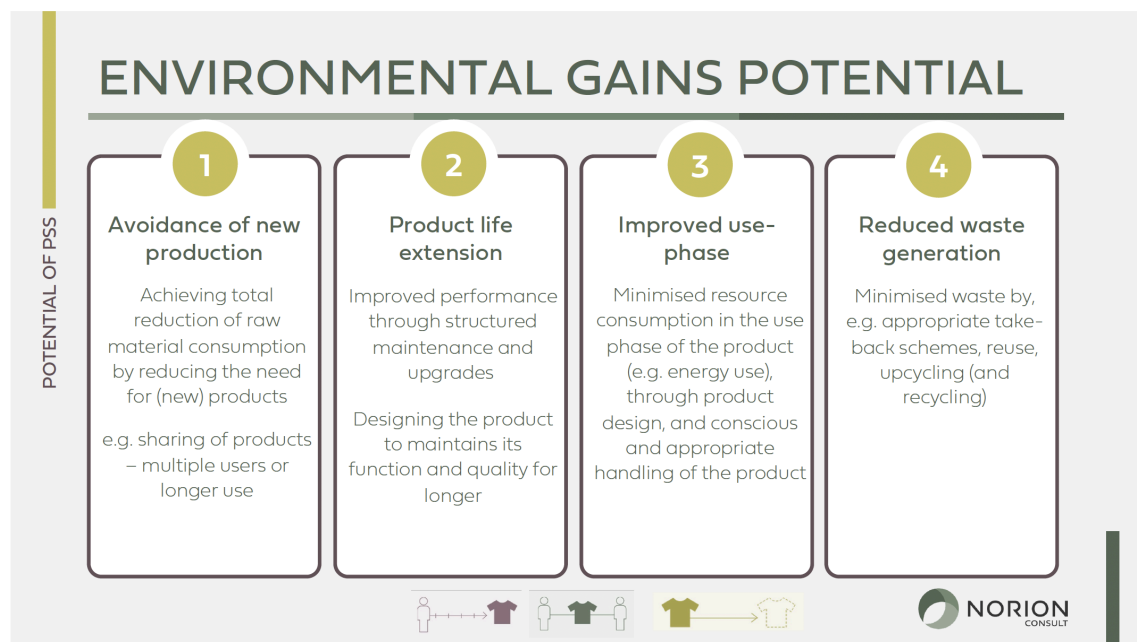
The second set of strategies enables *more users per product* by, for example, providing a platform or service that facilitates the movement of products from user to user.

The third set of strategies enable *users to go beyond physical products* by using digital products and services.

According to Kia Egebæk, these strategies come into play when companies set up *product service systems* (PSS). In PSS models, products are sold as services, e.g., through renting, leasing and sharing. Thus, the producer retains ownership of the product, enabling more use per user, more users per product and – in rare cases – users to go beyond physical products.

Kia Egebæk stressed that according to a study done by McKinsey, 71% of consumers are interested in using more environmentally friendly consumption practices, including circular business models such as resale and rental and refurbishment.^[15] In addition, Kia referred to the Ellen MacArthur Foundation's estimate that PSS has the potential to increase the use-rate of products from 25 to 45 uses.^[16]

Finally, Kia Egebæk emphasized that PSS – or circular business models in general – are no guarantee of a circular economy or reduction in environmental impact: It all depends on how the system is organized. On this topic, Kia suggested that companies focus on achieving at least one of four goals to ensure environmental gains compared to traditional linear business models:



Source: Webinar presentation. Find slides and recordings on the [project website](#).

Conversely, if PSS is not organized in accordance with these goals, the environmental gains will be limited or completely absent.

-
15. Global Fashion Agenda and McKinsey & Company. CEO Agenda 2020: COVID-19 Edition. <https://globalfashionagenda.org/resource/fashion-ceo-agenda-2020-covid-19-edition/> (accessed 10-09-2024).
16. Ellen MacArthur Foundation, *Circular business models: Redefining growth for a thriving fashion industry* (2021). <https://www.ellenmacarthurfoundation.org/fashion-business-models/overview> (accessed 10-09-2024).

Take-ways from “Textile consumption trends: Mind the gap(s)”

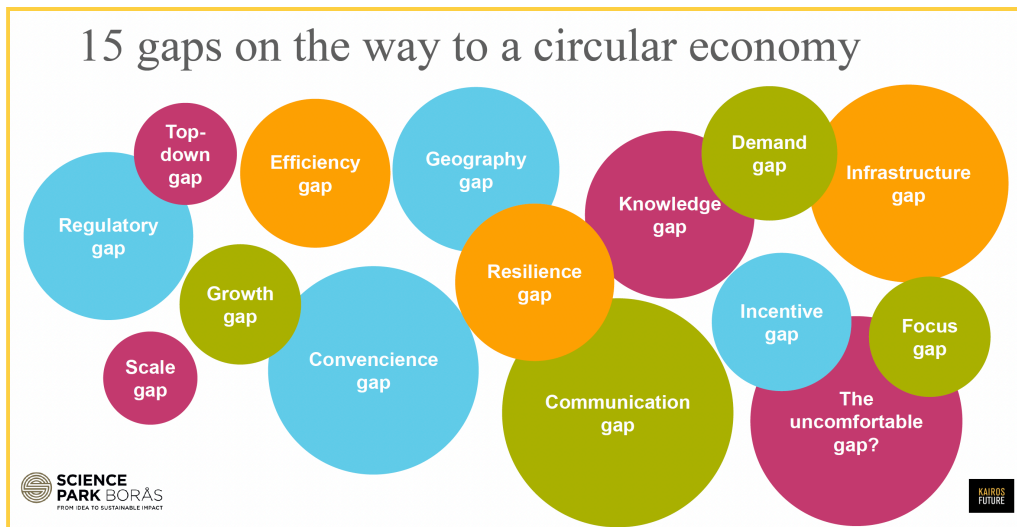
Presentation by Susanne Nejderås

While Kia Egebæk’s presentation focused on circularity from a business perspective, Susanne Nejderås introduced a broader approach, presenting five principles for building circularity in society:



Source: Webinar presentation. Find slides and recordings on the [project website](#).

Susanne Nejderås stressed that while these five principles are key, they cannot work unless stakeholders overcome current gaps, referring to the report “Mind the gap(s)”. The report presents 15 gaps that must be overcome to achieve a circular textile economy.



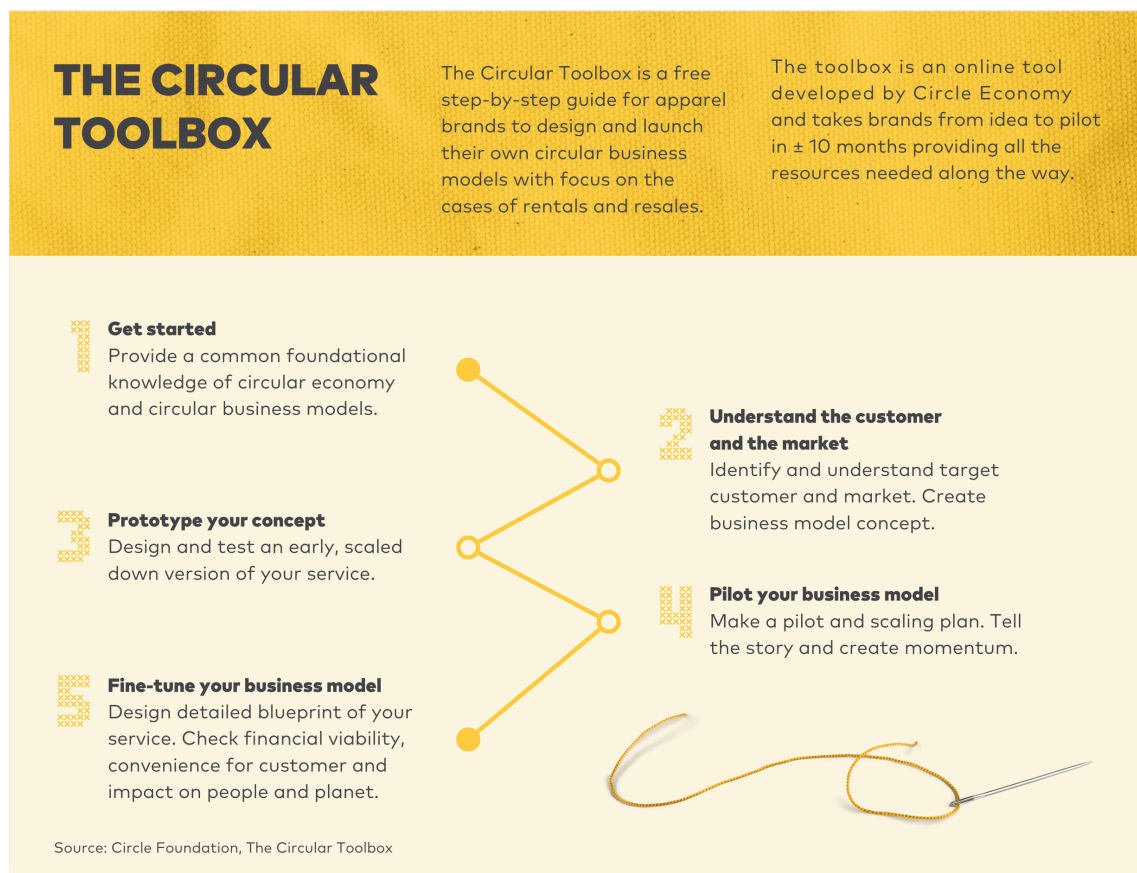
Source: Webinar presentation. Find slides and recordings on the [project website](#).

Just as Kia Egebæk did in her presentation, Susanne Nejderås highlighted the need to be aware of the risk of losing environmental gains related to circular business models. Susanne Nejderås added that obtaining environmental gains through circular business models is a responsibility of not only companies but of society.

Take-aways from "The Circular Toolbox"

Presentation by Louise Munkholm building on the work of Gwen Cunningham [17]

Louise Munkholm introduced participants to The Circular Toolbox developed by Circle Economy Foundation as part of the Switching Gear Project. The Circular Toolbox is a step-by-step guide for apparel brands to design and launch their own circular business models:



Infographic developed by Holm Kommunikation based on webinar presentation

17. Due to a last minute cancellation from Gwen Cunningham, project manager of The Circular Toolbox, the webinar showed a video recording available at YouTube with Gwen Cunningham presenting The Circular Toolbox (see the video here: <https://www.youtube.com/watch?v=xOnRTlfbh1o>) and shared general lessons from the project based on material available at The Circular Toolbox website: <https://www.thecirculartoolbox.com/>

The five steps are described by the Circle Economy Foundation in this way:

1. Getting started: Getting your team on the same page as to why a circular business model is needed, knowing the individual skills of your team and establishing goals and success criteria.
2. Understanding the customer and the market: Kicking off the work by identifying your target customer and market and translating and generating insights to develop a concept.
3. Prototyping your concept: Getting knowledge on how to design and test a prototype. The goal of this step is to generate as much data and information as possible from the customer and the market to develop and make improvements.
4. Fine-tuning your business model: Creating the business model blueprint, selecting the right partners and building the business case.
5. Piloting your business model: Identifying a core-messaging hook and translating it into a concept, knowing how to create the right momentum and scaling the plan.

The Circular Toolbox is the result of a co-creation between Circle Economy Foundation and four Nordic brands: Asket, Lindex, Kuyichi and ETP. The four Nordic brands went through the five steps and reported their results in a podcast where tips for inspiration are shared, such as:

Lessons and tips for inspiration

Be open minded and really take the opportunity to go through all of these steps

Be curious and explore during the whole journey

Don't overcomplicate things. Keep focused and narrow down to the things that really suits your company

Keep it simple. Begin small. It is better to start than to not have anything at all.



www.thecirculartoolbox.com

Source: Webinar presentation. Find slides and recordings on the [project website](#).

3.2.2 Pre-challenge webinars about textile consumption

Besides conceptualizing circular business models, the preparatory webinars of Active Textile Society introduced research regarding textile consumption in the Nordic countries to inspire discussions about what it takes to change consumer behavior in a more environmentally friendly direction.

Three presentations during the fall of 2023 focused on textile consumption and the Nordic cases of Norway, Denmark and Sweden.

Webinar presentations about textile consumption in the Nordics

Consumption cultures: Findings from citizen surveys by Professor in clothing and sustainability Ingun Grimstad Klepp, and Senior Researcher Kirsi Laitala, Consumption Research Norway (SIFO), OsloMet. Presentation held on September 27, 2023. Learn more about the project here: <https://clothingresearch.oslomet.no/>

Together against waste of textile - Results from a study on clothing consumption in Denmark by Katja Øder Schlesinger, Anthropologist and Senior Consultant at Norion, involved in the Danish Consumer Council's campaign "Stop Tøjspild". Presentation held on November 14, 2023. Learn more about the project here: [Sammen mod tøjspild | Forbrugerrådet Tænk \(taenk.dk\)](https://sammenmodtoejspild.dk/)

F/ACT Movement by Adrian Zethraeus, Project Coordinator, Science Park Borås, University of Borås. Presentation held on December 13, 2023. Learn more about the project here: [F/ACT Movement \(factmovement.se\)](https://factmovement.se/)

The following sections summarize key take-aways from the webinar presentations and the workshop.

Take-aways from "Consumption cultures: Findings from citizen surveys"

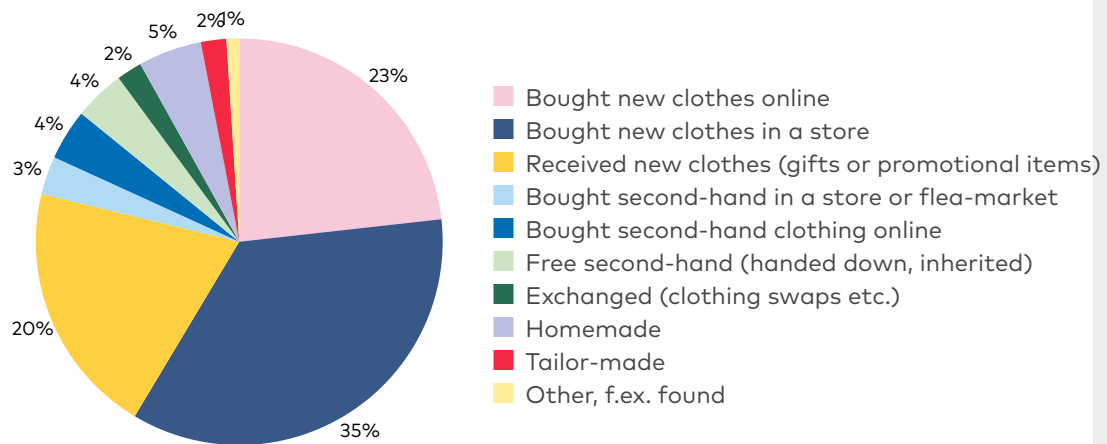
Presentation by Ingun Grimstad Klepp and Kirsi Laitala

Ingun Grimstad Klepp and Kirsi Laitala presented key figures about textile consumption in the Nordic countries. First, they showed that in 2018, less than 1% of clothing was bought as secondhand in Norway, which is rather low compared to other countries, such as Denmark, where 12% of clothes were bought as secondhand at that time. They also pointed out that the sale of new clothes was the same in Norway and Denmark, indicating that the secondhand market did not replace the purchase of new clothes in Denmark. In general, there is currently no indication that the purchase of secondhand clothes in the Nordics is limiting the amount of newly produced clothes purchased.

Ingun Grimstad Klepp and Kirsi Laitala then presented results from their survey of Norwegian textile consumption from 2023 with 1200 citizens. Their survey shows that 20% of clothing is bought secondhand, indicating that the secondhand market in Norway is growing.

Share of clothing acquisitions from different sources

(Past three months, percentage of clothing, 2023)



Share of second-hand clothing in acquisitions:

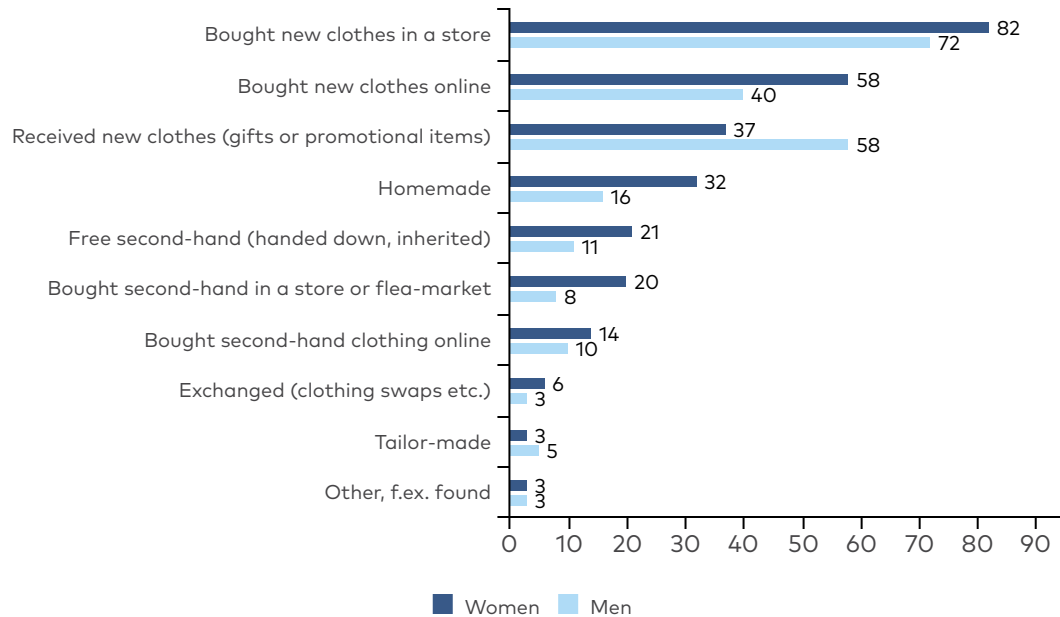
- Men: 15%
- Women: 23%
- Average all clothing: 20%

Source: Webinar presentation. Find slides and recordings on the [project website](#).

Furthermore, the 2023 survey of Norwegian textile consumption trends showed that "buying new clothes in a store" remains the most common method of clothing acquisition, closely followed by "buying new clothes online". The survey results also indicate that buying new clothes, buying secondhand as well as making your own clothes are more often practiced by women compared to men, whereas receiving new clothes as gifts is more common among men than women:

Own clothing acquisition methods the past three months

(Percentage of respondents, 2023, N=1200)



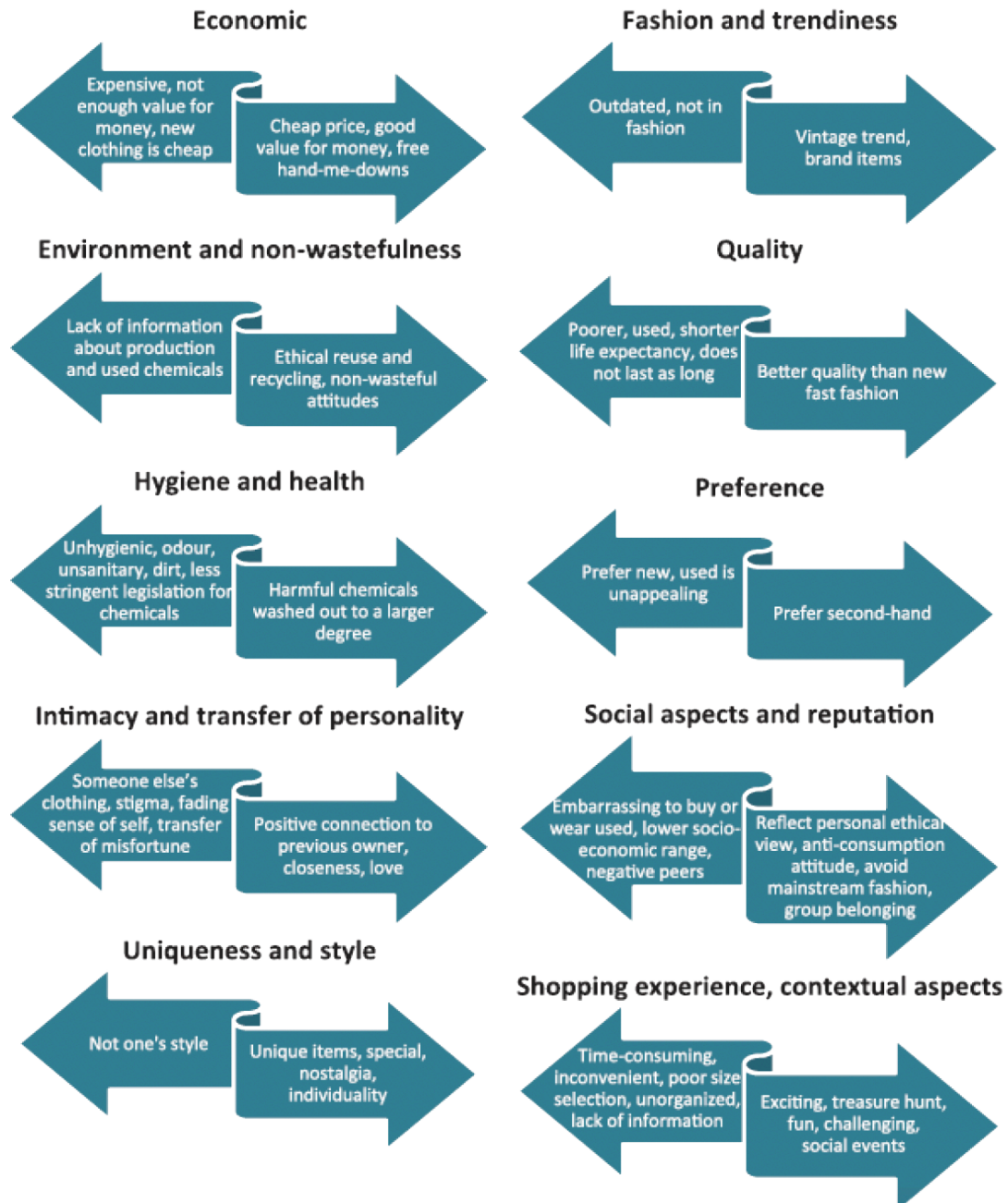
Source: Webinar presentation. Find slides and recordings on the [project website](#).

Another interesting finding from the survey presented by Ingun Grimstad Klepp and Kirsi Laitala was that the products bought the most in Norway are also the ones that are least available in the secondhand market. These products include socks, stockings and underwear. According to the presenters, this finding indicates that there is a need to buy certain items from new.

Ingun Grimstad Klepp and Kirsi Laitala grouped the barriers for using circular business models in pairs since some of the arguments are used by consumers both in favor of and against the use of secondhand clothing.

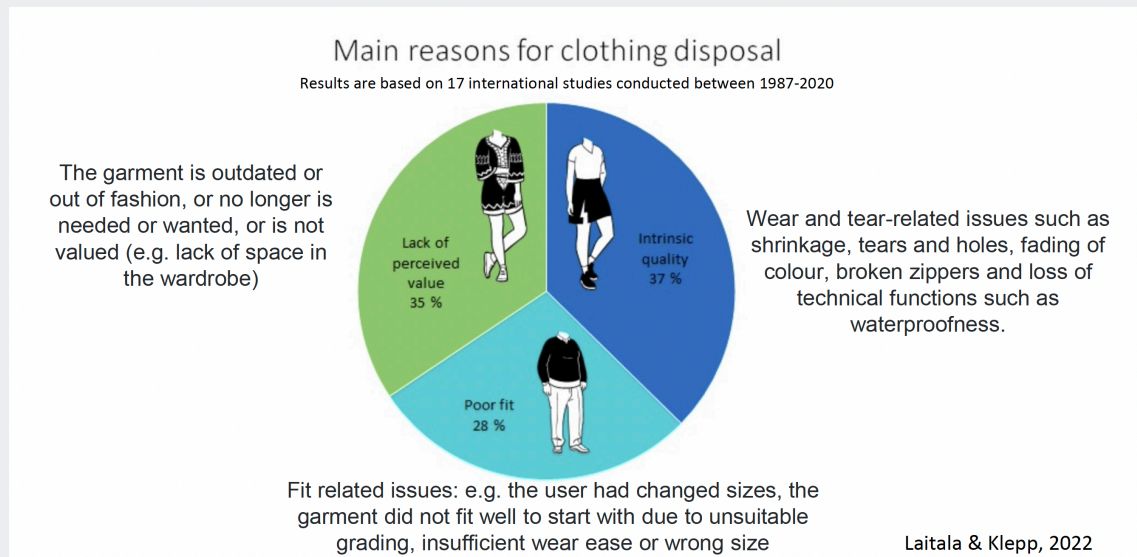
Motivations for and against second-hand clothing acquisition

Kirsi Laitala and Ingun Grimstad Klepp OsloMet – Oslo Metropolitan University



Source: Webinar presentation. Find slides and recordings on the [project website](#).

Ingun Grimstad Klepp and Kirsi Laitala also shared results from their studies showing the main reasons for clothing disposal. In their studies, they found three common themes: 1) The garment is outdated; 2) the garment is broken; and 3) the garment does not fit.



Source: Webinar presentation. Find slides and recordings on the [project website](#).

In addition, Ingun Grimstad Klepp and Kirsi Laitala shared insights regarding repair habits of the surveyed Norwegians. They found that repair was very common in Norway, where many people do repairs themselves or help each other out. In comparison, to pay for repair is not that common: Between 0 and 3 percent of the population surveyed for the book *Lettfiks* have done that.^[18]

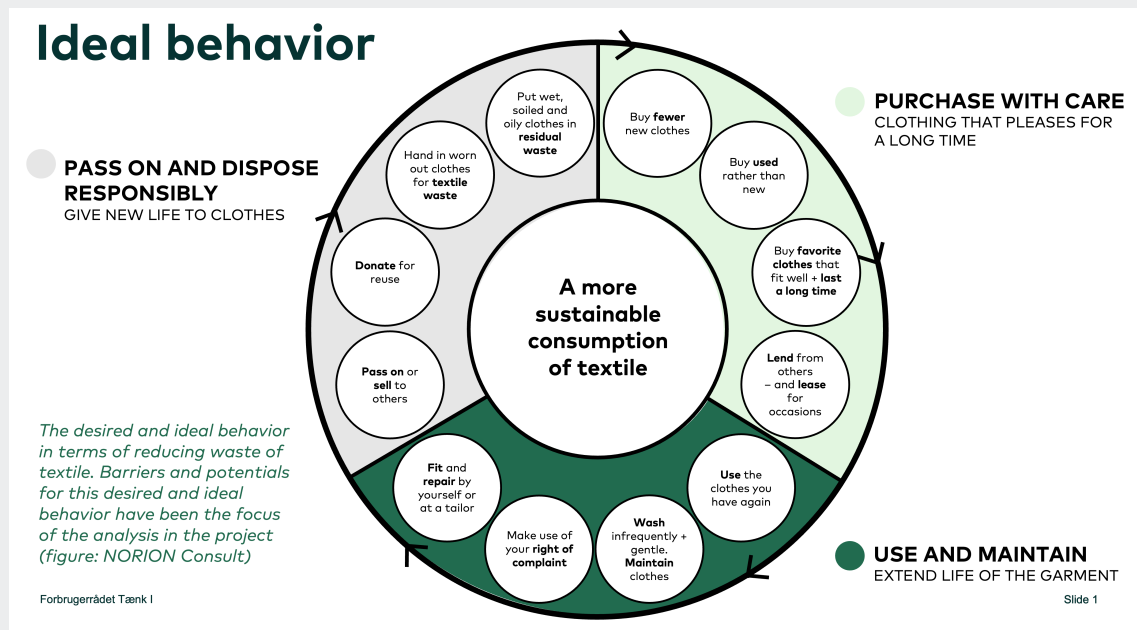
Furthermore, the study suggested that it is only high-priced clothing that people want to pay professionals to repair. This led the presenters to conclude that as long as very low-priced clothing is available, commercial repair is difficult to reach. They highlighted that this issue is actually relevant for all circular business models, which suffer from competition with a lot of new, low-priced clothing available on the market all the time. Therefore, according to the presenters, circular business models do not affect the environmental impact as long as they do not affect the tendencies of overproduction and overconsumption. Based on this argument, the presenters called for decision-makers in the Nordics to develop policy measures that favor the best business models from an environmental perspective while still securing a variety of clothes for Nordic citizens.

18. See Ingun Grimstad Klepp & Tone Skårdal Tobiasson (2021) *Lettfiks. Klær med ni liv* (Solum Bokvennen).

Take-aways from "Together against waste of textile - Results from a study on clothing consumption in Denmark"

Presentation by Katja Øder Schlesinger

Katja Øder Schlesinger presented findings from the national campaign targeted at adults over the age of 25 years and carried out from April 2022 to March 2023. The aim was to motivate consumers to purchase clothes with care, use and maintain clothes and pass on or dispose of clothes responsibly.



Source: Webinar presentation. Find slides and recordings on the [project website](#).

Based on a quantitative study (a questionnaire with 2000 respondents) and a qualitative study (wardrobe survey with 15 frequent shoppers), the project identified a number of barriers to reducing the waste of textiles:

Barriers for reducing textile consumption

- Experimenting with identities
- Buy on impulse
- Occasions/spheres
- Unofficial dress codes
- Lack of time
- Too much time
- Entertainment/social
- Economic surplus

"Dresscoden på jobbet driver meget, hvad jeg køber. Jeg har nok tøj til mit private, men det synes jeg slet ikke, jeg kan gå med på arbejdet (...). Jeg vil ikke gå på kompromis på arbejdet i at se snusket ud"

Mand, 35 år

"Om det er på computer eller telefon, så er det ligeså tilfredsstillende for mig at åbne Zalando appen som at åbne Facebook eller Instagram. Så går jeg ind på min favoritliste og kigger, og den liste vokser sig bare større og større. Så sidder jeg og kigger på det tøj, jeg har som favoritter og tænker over, hvornår jeg skal købe det, og så fjerner jeg også tøj, jeg ikke længere vil have"

Kvinde, 36 år

Forbrugerrådet Tænk |

Slide 2

Source: Webinar presentation. Find slides and recordings on the [project website](#).

The project identified ten ways forward, calling on producers, politicians and stakeholders to act:

Ten ways towards balanced clothing consumption

Manufacturers: Dress the consumer for success

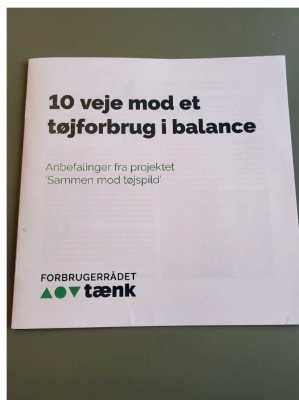
1. Give the consumer more options to reduce waste of textile
2. Rediscover old virtues and combine them with individual needs and frameworks
3. Create clothes that create value for the consumer (90% doesn't fit)

Politicians: Create system frameworks that reduce clothing waste

4. Review existing legislation
5. Branch code with industry to reduce waste of textiles
6. Call for a national action plan
7. Ban on destroying unsold clothes

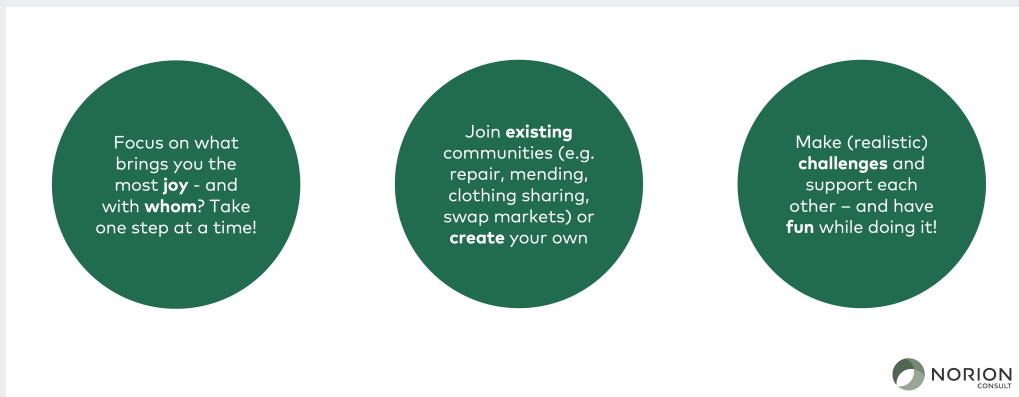
Stakeholders: Gather all players

8. Take advantage of a wide range of players with different expertise
9. Use experiences from other sectors and countries
10. Co-operate on uniform guidance for consumers based on reliable knowledge and safe reasons



Source: Webinar presentation. Find slides and recordings on the [project website](#).

As a final remark, Katja Øder Schlesinger stressed that "*Changing the way we acquire, use and pass on clothes can be funny and meaningful – especially if we do it together*", and she provided the following advice:



Source: Webinar presentation. Find slides and recordings on the [project website](#).

Take-aways from "F/ACT Movement"

Presentation by Adrian Zethraeus

F/ACT Movement is a campaign organized by Science Park Borås under the national framework Textile & Fashion 2030 in Sweden. The campaign was launched in 2019 with the aim of highlighting the need to drastically change the way people consume textiles and fashion. The F/ACT Movement promotes a so-called consumption pyramid that visualizes how consumption should look in order to fit into a circular economy:



Source: Webinar presentation. Find slides and recordings on the [project website](#).

According to this model, ideal textile consumption from an environmental perspective implies that people use what they already own and take good care of it, such as through repairs. If people need something that they do not already own, the consumption pyramid suggests starting with the options of borrowing, swapping or renting. If these options do not fulfil one's needs, people may consider thrifting. Buying new is the very last option if all other options have been exhausted. Adrian Zethraeus argued that this new way of consuming textiles and fashion can also lead to new business opportunities for companies, characterized by new business-to-business operations, with service providers making these new consumption practices possible.

Based on the argument that it is difficult to change consumer behavior, Adrian Zethraeus highlighted the need for pursuing citizen training. To stimulate the uptake of the consumption pyramid, the F/ACT Movement therefore gathered 70 citizens in seven places around Sweden and asked them not to consume new clothes for a period of nine months. During the nine months, participating citizens convened for monthly meetings and workshops to jointly explore how they could best continue consuming and experiencing fashion without using any new raw materials to do so.

This mix of meetings, reflecting and discussing with each other resulted in not only the creation of a new type of community vibe but also the uptake of new skills, enabling participating citizens to apply methods themselves aiming to prolong the lifespan of textiles, such as repairs and redesigns. Thus, the F/ACT Movement found that both elements – the building of new communities around lifespan extension of textiles and the hands-on training – constitute key building blocks for moving consumer behavior in a direction that supports the development of a circular textile economy.

3.2.3 The six-month challenge: Webinar and workshop about repair, redesign and product care

The first topics investigated during the six-month challenge were repair, redesign and product care, forming the basis of the webinar and workshop in January 2024. The webinar part focused on the methods for repair, redesign and product care to extend the lifespan of textiles – both functionally and emotionally. The themes unfolded through two presentations (see below). In the workshop, participants discussed barriers and solutions for using repair, redesign and product care and how to make the methods widely accessible and appealing in the broader society.

Webinar about repair, redesign and product care, January 24, 2024

Long live our clothes! Repair and redesign by Jessica Nilsson, SySL Redesign. Read more about the tools here: <https://sysl.dk/kurser-og-workshops/>

Care for clothing – care for the planet by Kirsí Laitala, Senior Researcher, Oslo Metropolitan University. Read more about the research here: <https://clothingresearch.oslomet.no/>

The following sections summarize key take-aways from the webinar presentations and the workshop.

Take-aways from "Long live our clothes! Repair and redesign"

Presentation by Jessica Nilsson

Everyone can do simple repairs using basic tools at home, such as scissors for changing zipper slider; candles when the zipper is tight and hard to slide; and pliers when the zipper is splitting (see the picture below). Jessica Nilsson's mission is to spread this message by offering tutorials for simple repair and redesigns on her webpage. During her presentation, she went through some of her most popular tricks, focusing on methods for fixing a simple hole and repairing a zipper:

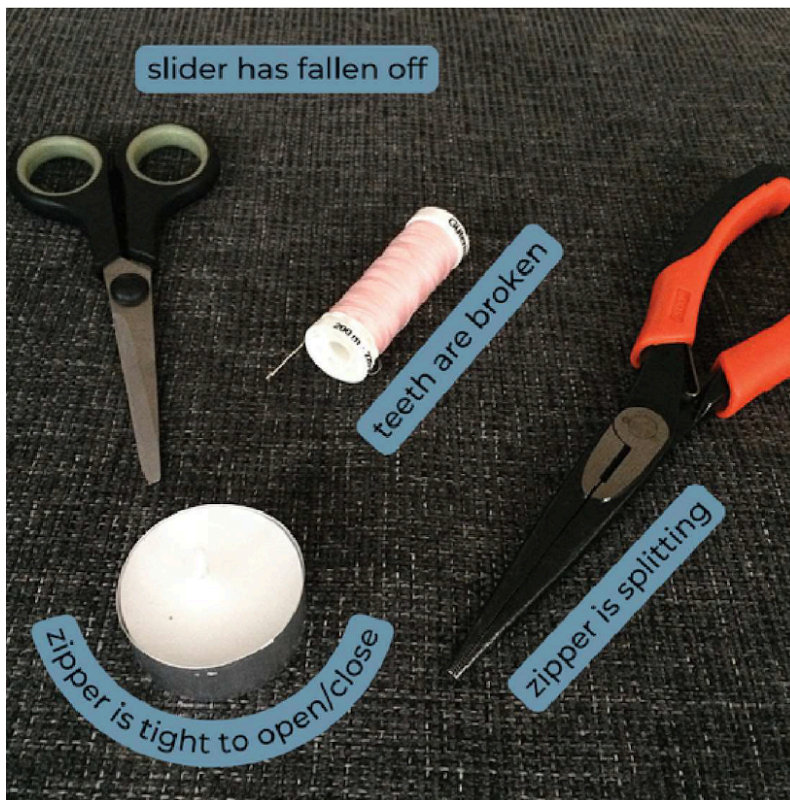


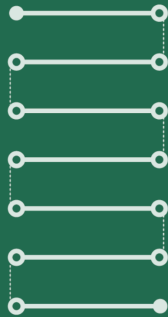
Photo by Jessica Nilsson

Source: Webinar presentation. Find slides and recordings on the [project website](#).

First, Jessica Nilsson presented the ladder stitch, which can be used to do invisible repairs (see instructions below). You can even use a thread in a non-matching color, and it will still be invisible. The ladder stitch is perfect for fixing pockets and ripped seams, e.g., stockings. You need to sew from the right side (facing you). You may sew with double thread for better durability.

REPAIR TRICK: FIX A SIMPLE HOLE USING LADDER STITCHES

Have you gotten a tear in one of your wardrobe favorites? Fear not! With this guide, you can repair your clothes easily. All you need is needle and thread.



Ladder stitch

Use the ladder stitch to do invisible repairs, even when using a thread in a non-matching color. Perfect for pockets, ripped seams, or stockings. You need to sew from the right side (facing you). You can sew with double thread for better durability.

Source: Jessica Nilsson, SysL Redesign, 2024



Infographic developed by Holm Kommunikation based on webinar presentation

Secondly, Jessica Nilsson presented three repair tricks for fixing a zipper:

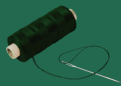
1. Fixing a zipper when it is splitting because of too much pressure on the zipper (if your bag is too full) or if it is old and worn out.
2. Fixing a zipper if it is too tight and hard to close.
3. Fixing a zipper if a tooth is broken.

REPAIR TRICKS: FIXING A ZIPPER

Three simple ways to fix your zipper using tools you have at home:



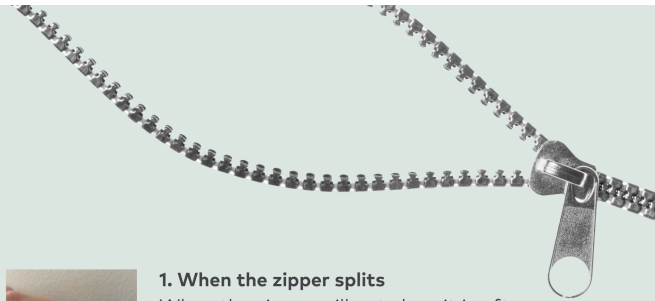
Candle



Needle and thread



Pliers



1. When the zipper splits

When the zipper will not close it is often because the "zipper slider" has been split apart. Use pliers to gently squeeze the slider together – do it in small steps and test along the way.



2. When the zipper is too tight

You can use wax from a candle to grease the zipper when it is too tight to function. Remove the metal covering the candle and rub the wax onto zipper.



3. When a zipper tooth is broken

When you need to repair a faulty zipper where a "tooth" is pulled out of place, you can sew to keep it in place. It needs to be parallel with its neighboring teeth.

Source: Jessica Nilsson, SySL Redesign, 2024

Infographic developed by Holm Kommunikation based on webinar presentation



Photo by Jessica Nilsson

Source: Webinar presentation. Find slides and recordings on the [project website](#).

In closing her presentation, Jessica introduced the notion of refunction. With simple adjustments, Jessica illustrated how to use a piece of clothing for different purposes, as a child grows. In Jessica Nilsson's example, it is a dress, which is turned into a shirt, and later a skirt:

Refunction

Using a dress for different purposes, as a child grows:



Photo by Jessica Nilsson

Source: Webinar presentation. Find slides and recordings on the [project website](#).

In summary, the tricks presented by Jessica provided hands-on advice for how to extend the lifespan of textiles and use the resources already available in existing wardrobes. The tricks require a few materials and equipment and, hopefully, provide the motivation for giving them a go at home.

Take-aways from "Care for clothing – Care for planet"

by Kirsi Laitala

Following Jessica Nilsson's presentation on repair, Kirsi Laitala's presentation focused on methods for extending the lifespan of textiles through product care. An increase in care and maintenance is needed when people acquire fewer clothes and keep them for a longer time. According to Kirsi Laitala, product care consists of clothing care and mindful use. Product care concerns the way people touch, wear, store, hang up, air, wash, repair, and assess their clothes. Mindful use covers a range of daily practices such as dressing and undressing, putting clothes away, dropping them or folding them neatly, and keeping them clean. For example, to extend the lifespan of one's textiles, clothes should be folded lightly or rolled to prevent hard crease lines. Likewise, hanging can stretch and distort clothes, especially when storing vintage or delicate pieces, cashmere sweaters, heavy knits and other articles with stretch. Kirsi Laitala also pointed to both caring for your clothes and reducing the environmental impact from laundering. The figure below provides an overview of Kirsi Laitala's advice regarding product care:



Infographic developed by Holm Kommunikation based on webinar presentation

Kirsi Laitala also stressed actions to be undertaken by producers and other stakeholders, including caring about the production conditions and people making the clothes; enabling care practices for consumers through the choice of materials, techniques, labelling, and instructions related to cleaning and repair; offering services for those tasks that are difficult for consumers to undertake themselves or tasks that require special equipment. These actions ensure that the products, when put on the market, are found valuable enough to be worth repairing and taking care of. Another important aspect of this issue is the lack of use of warranties. According to Kirsi Laitala, few citizens exercise their right to complain because they lack knowledge of consumer rights and because it requires too much effort and time to make a claim. Therefore, Kirsi devoted time in her presentation to provide an overview of warranty rights in EU/EEA countries based on the Consumer Purchases Act:

Warranty rights:

The length of consumers' statutory rights based on the Consumer Purchases Act varies but is a minimum of two years in EU/EEA countries.

You'll have legal rights if the item is:

- broken or damaged (not of satisfactory quality)
- unusable (not fit for purpose)
- not what was advertised or doesn't match the seller's description
- shelf-life/longevity is less than to be expected when purchasing such an item

You might be entitled to a repair, refund, replacement, or cancellation.

Reference: Laitala, Løvbak Berg and Strandbakken (2023) Why won't you complain? Consumer rights and the unmet product lifespan requirements. Plate, Helsinki.

Wrapping up her presentation, Kirsi Laitala touched upon the topic of repair and presented the reparability scale as an addition to the hands-on tricks provided by Jessica Nilsson. Kirsi Laitala repeated Jessica's message; you will come a long way with just a needle and a thread and there is already help available through simple means such as self-adhesive repair patches, books and online tutorials, repair cafés, friends or family members, including access to public sewing machines in some libraries. However, some repairs are more demanding and require professional help.

Repairability scale

1) Simple repairs/home repairs



2) Demanding repairs/professional repairs



3) Impossible repairs/permanent damages



Source: Webinar presentation. Find slides and recordings on the [project website](#).

As illustrated in the reparability scale, consideration should be given to which solutions are fit for simple, demanding and impossible repairs. Different types of repairs require different levels of skill and therefore different supporting mechanisms. Kirsi Laitala mentioned that, for example, holes in sportswear or children's wear are more often repaired than holes and tears on more formal clothing. It is therefore important to bear in mind the reparability scale when designing interventions: different parts of the scale require different supporting mechanisms.

After the presentations from Jessica Nilsson and Kirsi Laitala, participants moved on to the workshop.

Workshop findings regarding repair, redesign and product care

For the workshop, participants were divided into country groups and asked to reflect on the presentations from the webinar as well as their own experiences, in order to identify barriers and solutions to making repair, redesign and product care more widely accessible and appealing in their country. The following section clarifies the barriers and solutions identified.

Barriers to using repair and redesign and making it more widely accessible and appealing

During the workshop, participants identified the following barriers:

- **Limited overview of repair and redesign services and their availability.** Mainly lacking the knowledge about which repair and redesign services exist, where they are and what they cost, as well as the physical distance to repair and redesign services, and limited opening hours.
- **Lack of skills, equipment and materials.** Knowledge and skills to do repairs and redesign are limited and access to equipment and materials for do-it-yourself (DIY) solutions are lacking.
- **Concerns about costs and time.** Both DIY and professional help are perceived to be too expensive (time and money-wise) and take too much time compared to buying a new item. Also, participants were unsure whether the result would be worth the effort, time or money.
- **Lack of use of warranty.** This is both due to missing knowledge of consumer rights and because it requires too much effort and time to make a claim. Kirsi also highlighted this issue.
- **Human factors.** Habits are hard to change, and repair and redesign practices are not part of one's repertoire. At the same time, people lack an emotional connection with their clothes, preventing them from taking proper care of them. Shame was also mentioned as a barrier to taking one's clothes to a professional for repair or redesign, as it is perceived to be embarrassing to take cheap and worn clothes to the tailor.

Solutions to make repair and redesign more widely accessible and appealing

To mitigate the barriers and challenges identified above, the following solutions were identified:

- **Getting an overview of options** by, for example, establishing maps and platforms showing which repair and redesign services exist, where they are, when they are open, what they cost, etc., and solving challenges in regard to availability by promoting remote tailoring services and after-hours services.
- **Developing or reinventing skills** by, for example, including repair and redesign skills in educational systems and promoting repair and redesign hacks and tricks on social media and in the public sphere to inspire change. This could also include promoting local sewing groups and workshops that, for instance, experiment with repair and redesign on second-hand clothes in order to gain experience with so-called "low-stakes" clothing. Moreover, developing and reinventing the required skills will make people aware of the value of clothes and textiles and, over time, hopefully, make people proud, rather than ashamed, when it comes to repairing and redesigning old and worn wardrobe staples.
- **Acknowledging and promoting that time and costs are relative.** Consider, for instance, time and money spent on repair vs. time and money spent on impulse shopping. Another aspect points towards government subsidy and government aid to cover costs and to kick-start the change (as seen from the energy sector).
- **Ensure access to equipment and materials** by establishing and promoting a (second-hand) market for equipment and materials for DIY solutions.
- **Promote and raise awareness of warranty** on clothes.

The workshop input from participants regarding repair and redesign formed the basis for recommendations for actions moving forward (see [Chapter 6](#)).

3.2.4 The six-month challenge: Webinar and workshop about reuse and resale

The next round of webinars and workshops during the six-month challenge focused on experiences and hands-on tools for prolonging the lifespan of textiles by means of reuse and resale. The webinar part provided an overview of existing types of reuse and resale avenues, when to go for which and how to organize them in ways that attract customers. The themes unfolded through two presentations (see below). In the workshop, participants discussed the barriers and solutions to buying second-hand clothes in physical shops and online.

Webinar about reuse and resale, 13 March 2024

Fashion Worth Circulating: Why resale is a preferred circular strategy, how it (doesn't) work(s) and what we can learn from it by Mette Dalgaard Nielsen, PhD student, Royal Danish Academy. Learn more about the research here: <https://adk.elsevierpure.com/en/persons/mette-dalgaard-nielsen>

Reuse and resale of textiles - how we do it at Kierrätyskeskus Oy by Anu Hakala, Environmental specialist, Kierrätyskeskus. Learn more here: <https://kierratyskeskus.fi/en/>

The following sections summarize key take-aways from the two presentations and the workshop.

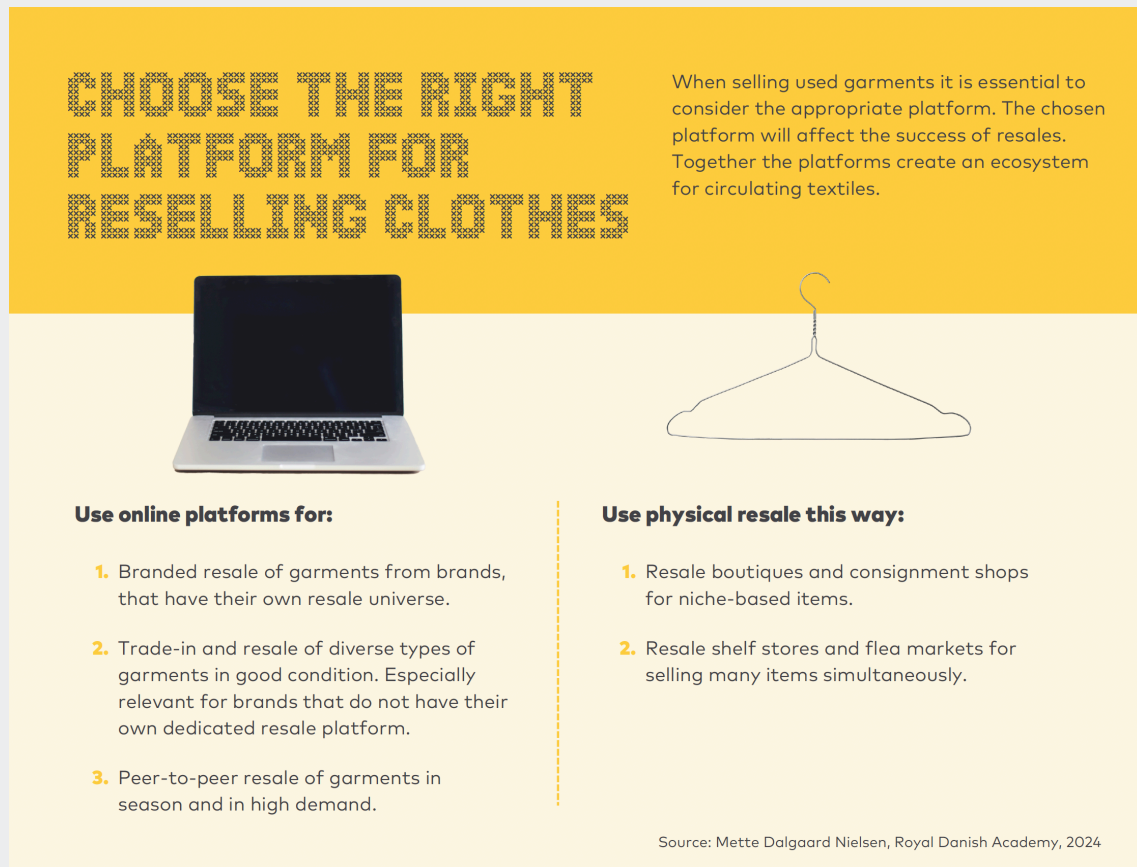
Take-aways from "Fashion Worth Circulating: Why resale is a preferred circular strategy, how it (doesn't) work(s) and what we can learn from it"

Presentation by Mette Dalgaard Nielsen

Mette Dalgaard Nielsen presented her research on resale. According to Mette Dalgaard Nielsen, resale is known as one of the most resource-efficient business models that offer the option of extending the use and the lifespan of products. However, resale may entail an expansion of the existing paradigm of expansion and growth, rather than a model of change.

Currently, resale exists in a linear paradigm. Mette Dalgaard Nielsen elaborated that while second-hand markets might prolong the lifespan of textiles, there are no indications that fewer new clothes are being bought. Thus, the existence of a resale market does not mean that fewer new clothes are produced: Volumes keep increasing worldwide. At the same time, garments today are not made to last (design-wise). Mette Dalgaard Nielsen unfolded this by pointing to the systemic issue of ultra-fast fashion; the quality and the price of items are crucial for how people value textiles, including whether they are worth using, repairing and reselling. Thus, putting low-quality garments on the market creates needs rather than meeting them. Ultimately, people do not have the garments that a circular textile economy requires, and people do not use items in their wardrobe enough because they keep consuming more. For the full potential of the resale market to unfold, everyone needs to stop producing and consuming incessantly.

A key learning from Mette Dalgaard Nielsen's research is that items the users consider valuable for resale may be wildly different (beige, colorful, high-end brand, high-street fashion, etc.). Moreover, the resale market consists of an entire ecosystem, with different models for resale meeting different needs and targeting different consumer segments. In her research, she has identified five different models as described in the infographic below.



Infographic developed by Holm Kommunikation based on webinar presentation

The different models for resale mirror the market for first-line sales, which can also be differentiated. An ecosystem of different models for both physical and online resale makes it possible for more people to utilize the second-hand market, including those with specific needs or those who live far away from a physical store. If you want to sell or buy second-hand textiles, it is therefore important to know which type of resale is most suitable for the specific type of textile you have acquired. Mette Dalgaard Nielsen's description of five different models can aid in choosing the right platform for reselling clothes.

In summary, Mette Dalgaard Nielsen underlines the importance of supporting the development of the ecosystem of resale models and ensuring that they reach their circular benefits by reducing volume and improving the quality of textiles.

Take-aways from "Reuse and resale of textiles – how we do it at Kierrätyskeskus Oy"

Presentation by Anu Hakala

Anu Hakala presented the experiences of resale of donated, used textiles at the nonprofit company Kierrätyskeskus in Helsinki. Kierrätyskeskus operates 13 second-hand stores in Helsinki and one online store, handling around 850,000 kg of textiles in 2023, of which 84% were reused.

Textile flows 2023

Textiles tot. ca. 850 000 kg / ca. 2 800 000 items

- 42% sold
- 42% handed out for free
- 16% energy utilization (+recycling)
- **Nothing is exported abroad**



Reuse rate 84%



Resales of textiles has grown steadily



Source: Webinar presentation. Find slides and recordings on the [project website](#).

As illustrated in the figure above, Kierrätyskeskus can sell 42% of the textiles received, while 42% are handed out for free. Resale of textiles is growing steadily and Kierrätyskeskus is using several strategies to increase sales. This includes improving their store environment and display of textiles to make it easy and appealing to find and buy second-hand. Kierrätyskeskus uses the strategies listed below to emphasize the importance of creating an easy overview of clothing categories based on, for example, gender, types of clothing and colors.



HOW TO DISPLAY TEXTILES IN SHOPS

Organizing store environments with clear categories, easily available information and spacious areas makes it easier and more appealing for citizens to shop secondhand textiles.



Wayfinding

Use signs to guide customers and make it easy for them to find what they are looking for.



Categories

Use clear categories and sections such as division by gender, type of clothing and color.



New arrivals and in-season

Maintain a section of new arrivals and in-season items with swimwear, winter boots etc.



Clean and tidy store

Keep the store clean. Hang garments on hangers and racks, and keep wide gaps between racks.



Price tag

Use price tags on all products.



Fitting booths

Make fitting booths spacious and include a mirror, chair and several hooks on each side.

Source: Pääkaupunkiseudun Kierrätyskeskus Oy - Helsinki Metropolitan Area Reuse Centre Ltd, 2024

Infographic by Holm Kommunikation based on the webinar presentation

Besides improving the store environment and display of textiles, Kierrätyskeskus focuses on redesign and identifying products in high demand. They have their own brand called The Plan B-collection, where they sew clothes, home textiles and accessories of donated textiles. It is small in volume and has not been a big success yet, as markets for pricey, sustainable and domestic produced products are marginal. Kierrätyskeskus also has a "most-wanted" collection, where they identify good-quality products which are in demand and can be sold at a higher price point. Like the Plan B-collection, it is small in volume, but easier to resell. Having this collection requires expertise in recognizing potential items and constantly monitoring new trends.

The remaining 42% of the donated textiles are handed out for free: after 4–12 weeks in the store, textiles are moved to the "Free items" room. Mette Dalgaard highlighted that garments today are not made to last (design-wise). Anu Hakala backed this, emphasizing that the inflow of low-quality clothes is high, which makes it difficult not only to sell used clothes but also to pass them on for free. Kierrätyskeskus has a free-item shelf or room, but textiles are challenging to pass on to a new owner, despite being free of charge.

In conclusion, Anu Hakala emphasized the need to create awareness through different educational programs; Kierrätyskeskus offers visits to the sorting and logistics center and the store to learn more about their operations, as well as training in recognizing good quality: learn what to check, the signs of quality and why quality is important. For repair and handicrafts, Kierrätyskeskus also offers all kinds of handicraft materials for sale, including pieces and patches of cloth, yarns, etc. In addition, they offer handicraft workshops for groups.

After the presentations by Mette Dalgaard Nielsen and Anu Hakala, participants moved on to the workshop.

Workshop findings

For the workshop, participants were divided into country groups and asked to reflect on the presentations from the webinar, as well as their own experiences, in order to identify barriers and solutions for using and making physical and online second-hand sales widely accessible and appealing in society. In the following sections, the identified barriers and solutions are clarified for physical and online sale, separately.

Barriers to making physical second-hand sales widely accessible and appealing

During the workshop, participants identified several barriers to physical second-hand sale:

- **Concerns about costs.** The citizens pointed to concerns about costs and emphasized that second-hand is sometimes too expensive compared to buying a new item.
- **Time is limited.** It takes time to find what you are searching for when shopping second-hand. Many experiences limited selections, making it difficult to find specific garments, materials or colors, which makes it difficult to buy an entire outfit in the same store.
- **Limited overview of options and availability challenges.** This includes lacking knowledge about which second-hand shops exist, where they are, and what they sell. Secondhand shops might also be far away and have limited opening hours. Moreover, it can be an unpleasant shopping experience, as second-hand stores are too cluttered, and products are in poor condition or are not presented nicely. It may also be difficult to find second-hand clothes if you do not wear a standard size, and the availability of second-hand clothing for men is limited.
- **Lacking skills to access quality.** Lacking the knowledge and skills to assess quality and fit.
- **No return option.** Items are often not eligible for returns, which can be challenging when determining whether something matches the rest of your wardrobe.
- **Human factors.** As with repair and redesign, participants mentioned that habits are hard to change, and shopping second-hand is not necessarily part of one's shopping habits. Participants also highlighted that shopping second-hand with a fast-fashion mindset can be a challenge with regard to extending the lifespan of textiles; this includes buying multiple items or buying more than you need, just because prices are low or because you do not have time to consider whether you actually need or will use them.

”

The price can make you buy it, more than the intention of wearing it or needing it. It's good that we resell but that is still accelerating the momentum of fashion. This is also overconsumption in a way. ^[19]

Workshop participant

19. Post-it quote from Active Textile Society workshop March 13, 2024.

Solutions to making physical second-hand sales widely accessible and appealing

To mitigate these barriers, participants identified the following solutions:

- **Behavioral changes and investing time in second-hand shopping.** This could include visiting second-hand stores often to practice second-hand shopping “skills”. You need to have a pragmatic mindset rather than going with a specific garment in mind. Be proactive and think ahead; for instance, start to search for replacement items before a current item is worn out. At the same time, communicating the consequences of unsold second-hand garments going to waste could provide an incentive to shift to second-hand shopping.
- **Government-supported marketing in the second-hand sector, as well as VAT exemption** on second-hand items and compensation for volunteer staff are also potential solutions moving forward.
- **Providing an overview and ensuring availability** could be facilitated through second-hand shopping tours, a second-hand fashion map or app of cities, supported by SoMe profiles. At the same time, making store layouts more appealing and sorting them by color and size would make it easier to find what you are looking for. Ultimately, this means setting up second-hand stores like stores selling new clothes and making them attractive by ensuring that they have their own style and niche. However, Anu Hakala stressed that this requires many resources. Self-service opening hours in secondhand stores might help ensure availability. Some participants also pointed out that selling second-hand clothes in the same stores as new clothes would make them more aware of the benefits of buying second-hand.
- **Second-hand stores should include a “free area”** where textiles have a last chance of finding a new home. This is, among others, a practice at Kierrätyskeskus, which also offers a handicraft service where fabrics, yarn, etc. are handed out for free for schools and other institutions.
- You could **bring your own clothes to the store to see if new items match** your existing wardrobe, in order to mitigate the challenge of not having the right to return purchases.
- To ensure that you do not use second-hand shopping with a fast-fashion mindset, it was suggested that people should **build personal resistance towards buying a garment**, to be picky and ensure that the garment fits them in both size and style.

Barriers to using online second-hand platforms and making them widely accessible and appealing

Barriers to using online second-hand platforms were also discussed. The participants discussed online sales on both brand platforms and peer-to-peer platforms. The following barriers were identified:

- **Limited selection.** Brands selling second-hand alongside new items often do not have a lot to offer.
- **Fear of being scammed or receiving faulty items.** Several participants emphasized the fear of being scammed when they don't know who they are buying from on peer-to-peer platforms. They fear purchasing counterfeits, and emphasized that poor item descriptions and blurry images, especially on peer-to-peer platforms, make it difficult to determine whether an item will fit, both in terms of size and their need for that specific piece of clothing in general.
- **Time and money.** It requires time and effort to find the right items, and some brands are overpriced when sold second-hand. Additional costs are also common when shopping online, transaction costs, shipping costs, hidden costs. Ultimately, the shipping costs can end up being higher than the cost of the item bought.
- **Online second-hand platforms can be unmanageable,** as there are varying systems across platforms, including different ways of managing and performing transactions.
- **Return policies** were yet again highlighted, as it is often not possible to return second-hand items bought online.
- **Environmental concerns:** Citizens prioritize local options as they wish to help reduce the increasing amount of transportation of clothes around the globe. Furthermore, participants discussed how they preferred not to buy second-hand clothing from companies who also sell newly produced fast fashion, which could indirectly support fast-fashion business models.
- **Human factors.** People miss the atmosphere and experience of shopping in a physical store or savor the memory of going somewhere special.

Solutions to making online second-hand sales widely accessible and appealing

A wide range of barriers to using online second-hand platforms were identified, and participants did not point to solutions to mitigate all of them. Nevertheless, two solutions were identified for mitigating the challenges related to managing online second-hand platforms:

- **Develop and share skills among resellers** in displaying second-hand clothes well and setting accurate prices across different resale platforms.
- **Establish an online directory of online stores.** This also includes developing different ways of encouraging recirculation, rather than only buying.

The workshop input from participants regarding repair and redesign formed the basis for developing recommendations for actions moving forward (see [Chapter 6](#)).

3.2.5 The six-month challenge: Webinar and workshop about rentals and styling

The third and last webinar and workshop during the six-month challenge focused on experiences and hands-on tools to prolong the lifespan of textiles by means of rentals and styling. The webinar part was held through two presentations (see below). In the workshop, participants discussed the barriers and solutions to using rental and styling as methods to prolong the lifespan of textiles.

Webinar about rentals and styling, May 15, 2024

When are rental services relevant and to whom? By Piia Nurmi, Senior Lecturer, Turku University of Applied Science. Learn more here: <https://www.tuas.fi/en/>

Rediscover your wardrobe: The 4 items (everyone already has) to provide endless outfits by Laura Lava, Independent wardrobe expert, author & speaker. Learn more here: <https://lauralava.dk/>

The following sections summarize key take-aways from the presentations and the workshop.

Take-aways from "When are rental services relevant and to whom?"

Presentation by Piia Nurmi

Like many of the other presenters in Active Textile Society, Piia Nurmi emphasized that taking care of your garments and extending their lifespan is key to reducing the environmental impact of textile production and consumption. Rental services are one way of prolonging the lifespan of textiles (more users per product), but environmental gains are obtained only if rental services are used as an alternative to new production.

Defining rental, Piia Nurmi underlined that a company owns the product and you, as a customer, are renting access to that product (using the product as a service model (PaaS) approach: see [section 3.2.1](#)), which means that customers do not buy the clothes but pay for the services related to wearing them. Rental is a customer-oriented service concept, which first and foremost requires products of a certain quality, but it must also provide added value for the consumer to use the product as a service rather than owning the product; for example, it could increase consumer convenience.

Piia Nurmi's research shows that services such as style consultancy, repair and remodeling increase the attractiveness of rentals. At the same time, Piia Nurmi explained that to create a sustainable business model, the triple bottom line of sustainability must be included. In other words, the benefits for society and the environment are included, in addition to the economic value of a product:

3.1 VALUE OF THE PRODUCT AS A SERVICE MODELS

The PaaS model is considered as a sustainable business model (with some limitations: read more in chapter 3.2), and it includes benefits for society and the environment in addition to the economic value. These three aspects are often called the triple bottom line of sustainability. It is important for companies to understand both the positive impacts and the challenges that arise from exploiting the Product as a Service model from the perspective of all these aspects.

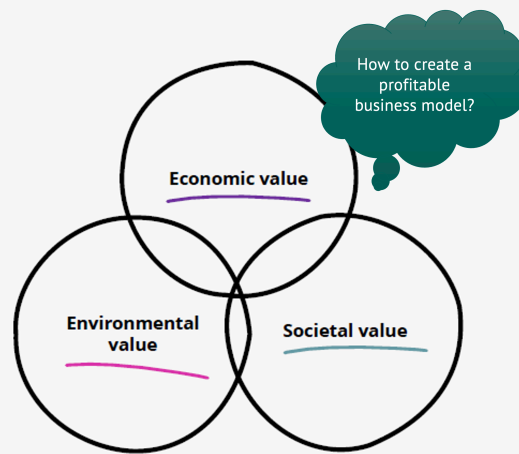


Figure 4. The triple bottom line of sustainability.

<https://urn.fi/URN:ISBN-978-952-216-820-7>

Source: Webinar presentation. Find slides and recordings on the [project website](#).

Piia Nurmi advised brands to study what kind of services their customers need, as these are central to developing a rental model. For example, they should consider the duration of the use period; some customers are looking for short-term use, as they want to swap their clothes often, while others want long-term rental periods. Flexibility is also crucial; the setup must not require too much from the customer and should not be too expensive. In summary, customers want easy access, reliability, not having to care for or wash the product, flexibility and a good price. The figure below gives an overview of the benefits and the barriers of product-as-a-service models from a customer perspective, as presented by Piia Nurmi:

Benefits and barriers included in product-as-a-service models from the customer perspective

The benefits may include:

- Confidence that the product is ready for use when you need it
- No need to care for the product after or during use
- Flexibility when needs change – if you need something more or less, or need something different
- No need to invest in the product

The challenges and the barriers may include:

- Moving away from ownership of the product (changing mindset)
- Sharing the product with other customers (e.g., hygienic concerns)
- Arranging logistics and product maintenance (if not provided as a service)
- Requirements for planning (e.g., timing of product use)
- Incompatibility of the product selection with specific customer needs

Source: [Guide for developing Product as a Service business \(theseus.fi\)](#)

To assist companies in developing rental services, Piia Nurmi introduced a guide for the development of product-as-a-service (see above). The guide provides information, examples and practical tools on how to develop and implement product-as-a-service-business models. Two pilot projects were highlighted: casual wear as a service and workwear as a service. A key learning from the two pilots is that it is crucial to identify the customer segment and design the service model in accordance with their needs, price incentive, etc., as highlighted earlier. Furthermore, the pilots revealed that data is often collected, but not used. Data information needs to be shared more to understand the model and the room for improvement. Furthermore, the barrier of an intense focus on hygiene was highlighted as this causes rented clothes to be washed often – perhaps even more than needed. While both pilots were successful, the rental model for casual wear is currently on hold, as the business is not sustainable at the moment, due to lack of demand. On the other hand, workwear as a service is thriving and, in general, there is a growing demand for rentals of workwear.

Take-aways from "Rediscover your wardrobe: The 3 items (everyone already has) to provide endless outfits"

Presentation by Laura Lava

Laura Lava started her presentation by highlighting the need to shift the focus away from the consumption of new goods to using what people already own. This implies investing time in using and maximizing one's existing wardrobe. To succeed, Laura Lava identified three must-haves for a great wardrobe: time, overview, and a full-length mirror.



Time: you need time for sorting, repairing, and laying out your clothes/ outfit for the next day.



Overview: you need to know what you have to create an overview of your styling options. Laura used the term "building blocks" to organize the clothes in different categories as shown below.



Full length mirror: an underrated, but very important item to be able to see your full outfit.

Source: Webinar presentation. Find slides and recordings on the [project website](#).

According to Laura Lava, the first thing to do in order to create an overview of one's wardrobe is to declutter and re-organize it. It is not the number of clothes in the wardrobe that is important but knowing what clothes you have. One way to create this overview is to organize the clothes in building blocks; tops, bottoms, full-body garment, and outerwear. This will provide the overview you need to see the options available to build an outfit. A friendly wardrobe is a wardrobe with clothes that fit and are loved. Think of your wardrobe as a library, which may hold many items, but is very neatly organized to provide a clear overview.

The building blocks:

- **Outerwear** for example jacket, coat, blazer, sweater, cardigan, sweatshirt and waistcoat
- **Top wear** for example t-shirt, shirt, blouse, and tank top
- **Bottom wear** for example jeans, trousers, skirt, and shorts
- **Full body garments** for example dresses, and suits

Source: Webinar presentation. Find slides and recordings on the [project website](#).

Once the wardrobe is organized in building blocks, you can focus on styling strategies and keeping your wardrobe tidy. Laura rounded off her presentation with a series of styling tips focusing on how to create your outfit, but also how to ensure a proper wardrobe strategy to ensure that your wardrobe is kept organized and relevant; for example, by making a positive and negative shopping list to guide your investments in new clothes.

ACTIVATE YOUR WARDROBE

- 1. Three must-haves for a great wardrobe:** If you want to get the most out of your wardrobe you need enough time, an overview of your clothes, and a full length mirror.
- 2. Pair "difficult" items with favorite items:** Pair items that you do not use often with favorite items. This way you might find new outfits.
- 3. Make your own + / - shopping list:** Find out what type of items you actually need (+) and what you already have enough of (-). If you have 9 pair of black jeans, a 10th pair won't really make a difference.
- 4. Mix formal and informal clothes:** Try to mix for example denim jeans and a shirt, pleated pants and a sweater, or tracksuit pants and a blazer. Thinking in contrast often creates more interesting outfits.

Source: Laura Lava, 2024

THE 3 COLOR RULE

Two colors are static. Mixing three colors creates more dynamic outfits, and can make you stand out. Also, you can use the **Light - Medium - Dark** approach by choosing light, medium and dark hues respectively when you put together different outfits.

You can use colors to shift attention up and down by using light and dark colors strategically. Light colors enhance and dark colors tone down.

3 x color



Light - Medium - Dark color



Infographic by Holm Kommunikation based on webinar presentation

After the presentations from Piia Nurmi and Laura Lava, participants moved on to the workshop.

Workshop findings

For the workshop, participants were divided into country groups and asked to reflect on the presentations from the webinar, as well as their own experiences, to identify barriers and solutions for using and making rental and styling widely accessible and appealing in society. The following section presents the identified barriers and solutions.

Barriers for using rental services and making them widely accessible and appealing

During the workshop, participants identified central barriers to using rental services. In general, a few of the participants had tried rental services and some did not know it was possible to rent clothes. Therefore, the barriers identified both reflect the experiences of some participants and the constraints met by others on even trying rental services.

- **Limited overview of rental services and their availability.** Several participants highlighted the lack of awareness of existing rental possibilities and emphasized that long distances to the closest rental place is a logistical challenge. Furthermore, not knowing what rental services offer and what they cost restricted many of the participants from seeking rental services.
- **Concern about costs and liability.** The participants perceived rental services as expensive and found it cheaper to own their clothes. Participants likewise emphasized concerns about liability if they ruined a garment during rental, such as by staining it.
- **Inconvenient and time consuming.** Participants find renting clothes to be cumbersome, especially with online services, where you have to send and receive rented clothes and are not able to try on or feel them. There is a fear of clothes not fitting, as it is hard to find the right size, especially if subscribing to a service. Bringing back the rented item also seems like a chore and is time consuming, as it takes time to plan when and how to use the rental service, and you will probably have to wait a few days to receive the piece – inconvenient if there is a sudden need for it.
- **Hygienic concerns.** Perception that rental clothes are dirty.
- **Limited need for new clothes.** Several participants also highlighted that they did not find rental services attractive, as they only owned and needed clothes that they love and use. When owning clothing, the participants emphasized that they know what quality and care is involved and could use the clothes for their entire lifespan. Most participants also emphasized that they find rental services relevant for workwear and clothes for special occasions, but not everyday wear.

Solutions to making rental services widely accessible and appealing

The participants suggested the following solutions:

- **Providing incentives.** The participants agreed that making it easy and providing incentives for using the service were key for making rental services an appealing option. One of the participants rented her wedding dress, but because she was the third person to rent the dress, she got the opportunity to keep it: this was a strong incentive for her to rent. Based on this, one idea was to establish that if the clothes have been rented out x times and it is "worn out", you could allow the last customer to keep them. Participants also emphasized the incentive of telling the story of how rentals reduce the environmental impact of textile consumption. Pregnancy wardrobe and children's clothes were mentioned as ideal categories of clothes for a rental service, as these types of garments are often used for a limited period of time.
- **Raise awareness of rental services.** The participants emphasized a need to make citizens aware that rental services are an option for everyone.
- **Making rental services convenient.** It is important to ensure ease of access to physical rental stores and that they are close to stores selling new garments or combining selling and renting in the same store. In case of an online rental service, it requires a user-friendly website showing the services on offer. Returns should also be made easy and convenient, for instance, by offering a pickup service.
- **Promoting an app that can help you with sizing** would be useful; for example, by taking your measurements so that the tailor can prepare a perfect fit.
- **Making it affordable.** Providers should ensure a proper level of cost and explain how the cost is actually not higher than buying new garments every time. Also, they should emphasize that the citizen gains time by not having to do product care, washing, etc.
- **Legislation:** The government could introduce legislation requiring the offering of rental services and tax reduction on rental companies.

During the workshop, participants also discussed experiences with styling and identified a list of barriers and solutions to using styling as a tool for expanding the lifespan of textiles.

Barriers for using styling methods and making it widely accessible and appealing

During the workshop, citizens participating identified several barriers to using styling methods and organizing their wardrobe. In general, many of the participants felt that they lacked skills to style their wardrobe and ended up using the same outfits repeatedly. However, some participants already used many of the techniques presented by Laura and focused on limiting their wardrobe, for example, through the concept of a capsule wardrobe. The identified barriers to using styling methods and organizing their wardrobe are listed below:

- **Limited styling skills.** Several participants pointed to the issue of repeating outfits and not having imagination to see what things would fit together, but always going for the old, tried, safe combinations. Consequently, the participants usually started to fall out of love with their old clothes and wanted to buy new.
- **Time constraints.** It was not always possible to take the time needed to study and reorganize your wardrobe based on Laura Lavas methods.
- **Concern that professional stylist services are costly.**

Solutions to make styling methods widely accessible and appealing

The participants discussed and identified solutions to mitigate the barriers and challenges identified above. Many of the solutions listed below have direct links to Laura Lavas' presentation, which underlines both how this topic was unknown to the participants, and how Laura's presentation gave hands-on tips that seemed useful to the participants:

- **Overview.** Owning fewer items. Participants also suggested keeping winter and summer clothes separated and storing out-of-season clothes in boxes.
- **Time.** Take the time needed to pick out your outfit.
- **Focus on accessories,** such as a belt, to update your outfit and mitigate "outfit repeating".
- **Getting styling tips and help from friends and family.** Make it a social event, just like a shopping trip, which is cozy to do with friends. Consider helping each other with styling the clothes already in the wardrobe.
- **Learn more about styling** and get help through styling courses and tutorials or a personal virtual helper or digital wardrobe, but with solutions that are not expensive and at the same time easy to use and need limited time. Investing in a session with a professional stylist could also be seen as a one-time investment in knowing your preferred shape or fit, and ultimately save money in the longer run by limiting mistakes when shopping.
- **Own a full-length mirror** to be able to see your full outfit.
- **Make a shopping list for clothes** and only buy what is on the list. Remember to balance the list depending on what kind of clothes you have and do not, for example, buy tons of tops.

The workshop input from participants regarding repair and redesign formed the basis for developing recommendations for actions moving forward (see [Chapter 6](#)).

In parallel with webinars and workshops, participant experiences were gathered through surveys. The rest of the chapter presents results from these, focusing on companies and citizens and their experiences during the six-month challenge.

3.3 The journey of participating companies

Active Textile Society aimed at bringing together companies and citizens across the Nordic countries to break down barriers for circularity. The initiative attracted different types of companies willing to engage with and develop circular business models as part of the six-month challenge. In total, nineteen companies active in the Nordic textile and fashion industry joined the initiative:

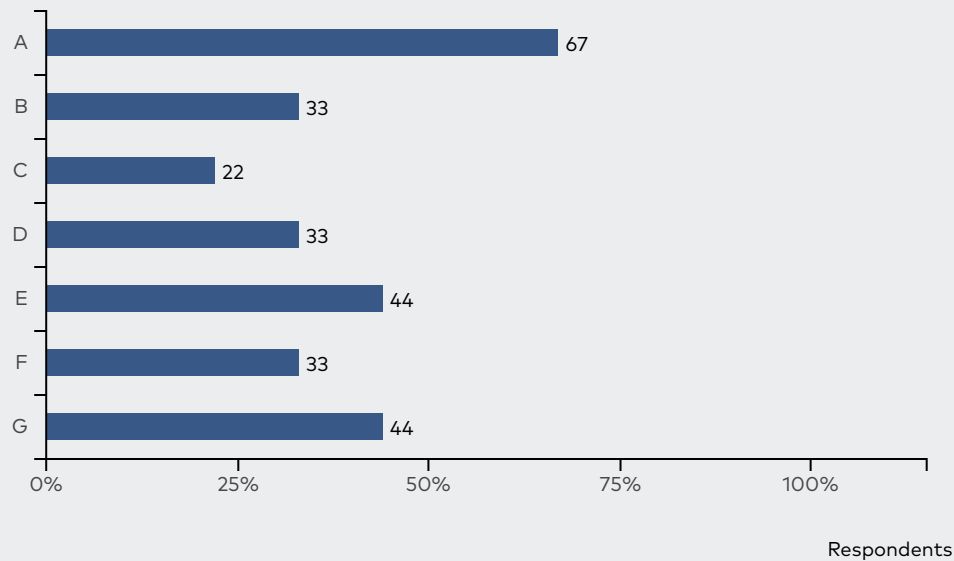
- Nine companies from Denmark, four companies from Finland, four companies from Norway and two companies from Sweden.
- Eighteen of them were micro- and small companies with less than 50 employees. One was large, with more than 250 employees.
- Eleven of the companies described themselves as being active in production of textiles, including clothing for women (five companies) and men (one company), workwear (four companies), as well as bags and accessories (one company).
- When describing their existing business model, most of the companies indicated that they already provided services related to extending the lifespan of their products through circular business models, such as repairs, redesigns, resales and rentals. Few of the companies stressed that they used circular design principles to enhance recycling, and some mentioned that they have take-back solutions as well as resale infrastructures in place already.

Before starting the six-month challenge, companies were asked to provide information about circular business models of interest as well as resources needed to carry out the transition and barriers foreseen. Nine companies answered the survey. The survey showed that participating companies had a great interest in exploring the circular business models of repairs and redesign, but also a few wanted to seek out opportunities for resale, rentals and other new options, such as production on demand, recycling and take-back solutions.^[20]

The following table summarizes responses to the survey question:

20. The respondents could choose more than one option based on a predefined list of the circular business models known as "resale", "rental", "repair", "remake" and "others".

What types of resources do you have that support the completion of the challenge?



A	Human resources (e.g. employee time to complete the challenge)	6
B	Marketing resources (e.g. employee time to create awareness of your service)	3
C	Design resources (e.g. employees who can handle the new service)	2
D	Marketing resources (e.g. employee time to create attention and awareness of your service)	3
E	Design resources (e.g. skilled employees in-house who can handle the new service)	4
F	Logistics (e.g. capacity, shipment and shop space for offering the service)	3
G	Other (please elaborate):	4

It is relevant to note that

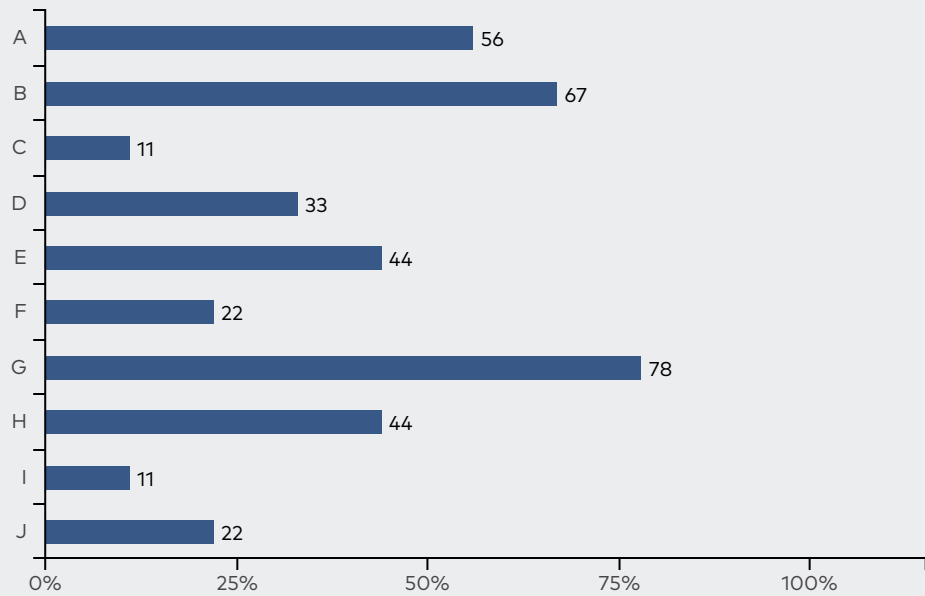
- Only around two-thirds of the respondents have human resources available in house;
- Only half of the companies have design resources;
- One third has financial resources, as with marketing resources and logistics; and
- Around one quarter of the digital resources available in house.

These answers indicate that most of the companies lacked crucial resources for making the required changes and achieving a circular business model. One of the participating companies stressed the issue in this way: *"We don't have the needed in-house competences and vision to create awareness of new services."*^[21]

21. Quote from the survey "Getting ready for the six-month challenge" conducted in November 2023.

The following table summarizes findings regarding barriers foreseen by participating companies:

Which barriers do you foresee when it comes to completing the challenge?



		Respondents
A	Time and internal resources, including competences and skills	5
B	Budget for developing and implementing a circular business model	6
C	Revision of purpose and vision of the company	1
D	In-house capacity (storage, shipment, shop space etc.) for facilitating the service	3
E	Reorganization of sales platforms	4
F	Getting sufficient data from suppliers for documentation purpose or calculation of baseline	2
G	Customer incentives, i.e. making the circular business model attractive to customers	7
H	Profitability i.e. making a profit of the circular business model	4
I	Regulations, e.g. complying with rules, requirements and standards	1
J	Other (please specify):	2

The survey's responses indicate that companies foresee difficulties with providing customer incentives as well as raising the necessary budget, time and competences for developing and implementing circular business models. The category "Other" includes the challenge of educating customers to depart from conventional buying and selling of textiles, thus underscoring that lack of customer incentives is a key barrier for the promotion of circular business models, according to the participating companies.

To overcome these barriers, companies reported in the survey that they saw a need for citizen feedback on services, peer-to-peer advice and assistance from experienced circular business companies, as well as more information about the implications of new EU legislation.

To sum up, the initiative attracted companies from across the textile value chain and across the Nordic countries, all of them eager to learn more about the extension of textile lifespans through circular business models and to engage in a dialogue with both citizens and peers about these issues.

The following sections describe the journey of four companies that shared experiences with their circular transition during the six-month challenge by filling out bimonthly logs about how they fared.^[22]

Company 1: Developing and testing a platform for transparent product management to boost resales

Activity: To pave the way for offering resales, the company developed a digital product passport (DDP), working as a platform for transparent product management. During the six-month challenge, the company tested the DDP with pilot clients and worked with a new partner to achieve a user-friendly platform.

Barriers: Several of the pilot clients found onboarding challenging because they did not have any data structure in place that could provide product data or history for secondhand garments, nor the skills for collecting and managing such data.

Solution: The company prepared simple guides for how to use the platform and acted as a bridge-builder between the different stakeholders. The company summarized the effort in this way "*We believe that the key to a circular market is cooperation. We started to introduce different groups to each other and encourage them to share their solutions and build one stronger solution together.*"

Source: Active Textile Society, Company logs from February and April 2024.

22. The four companies submitted logs in February, April and June 2024 focusing on which barriers and solutions they experienced as part of their circular transition. Several other companies shared their experiences during the online workshops hosted as part of the Active Textile Society webinar program (see section 3.2) but did not fill out the logs while a number of the companies had to opt-out during the project period due to limited time and resources.

Company 2: Introducing a digital measuring system for production on demand and resales

Activity: To improve its models for production on demand and resales, the company worked on introducing a digital measuring system.

Barriers: Lack of time and money stood in the way of implementing and scaling up the solution.

Solution: The company decided to do "baby steps" rather than developing a full-scale system.

Source: Active Textile Society, Company logs from April 2024.

Company 3: Improving service and product circularity

Activity: The company wanted to improve their existing model for producing and selling workwear, with a focus on servicing, testing, repairs, and product circularity. The company described the efforts in this way: *"Since product servicing is already integral to our business, we are now concentrating on how to bridge the gap in our circular business model regarding end-of-life recycling of products and materials. We will place greater emphasis on the design phase to ensure our products remain compatible with servicing and repairs."*

Barriers: Due to the high standards required for workwear, the product costs are intensive. At the same time, it proved very difficult to meet expectations from customers in terms of speedy delivery times, as circular services, such as demanding repairs, take time to carry out.

Solution: The company focused on product development, engaged in strong partnerships with existing suppliers and invested resources in communicating better to customers the operational time of their service actions. The company provided the following advice for other companies implementing circular business models:

- Rethink consumption and production: The first key driver for a circular business model is to challenge traditional consumption patterns and mass production. Shift the focus from creating overcapacity and surplus stock to producing high-quality, sustainable items that meet real needs.
- Promote mindful consumption and encourage customers to buy less but better. This fundamental change supports a more sustainable future and reduces overall environmental impact.
- Update Economic Models: The world economy needs an update and a re-think from competitive business models to a more collaborative approach. We should work together, share knowledge, and refrain from using it solely as an advantage to sell more products.

- Holistic view: Address the entire product lifecycle, from design to disposal.
- Design for durability: Develop products that are long-lasting, repairable, and upgradable.
- Closed-loop systems: Establish return programs for recycling, refurbishing, or remanufacturing.
- Supply chain partnership: Collaborate with suppliers dedicated to sustainable practices.
- Digitalization: Implement digital tools to monitor materials and optimize product lifecycles.
- Educate employees: Train staff on circular economy principles and new procedures.
- Innovate and collaborate: Engage with other organizations to exchange knowledge and resources.
- Transparent communication: Clearly communicate your circular initiatives to stakeholders.
- Track progress: Set up metrics to monitor and enhance circular practices.
- Regulatory compliance and advocacy: Stay updated on regulations and promote policies that support circular practices

Source: Active Textile Society, Company logs from February and June 2024.

Company 4: Improving upcycling as a business model

Activity: The company worked with upcycling as a business model and wanted to improve the existing operation through research on new methods and materials.

Barriers: It was difficult to develop the business strategy, including identifying the purpose and the vision of the company as well as difficult to find the right input material.

Solution: Defining purpose as "small-scale upcycling" and investing time in searching for suppliers.

Source: Active Textile Society, Company log from June 2024.

To sum up, the companies did try out different circular business models, including resales, repairs and redesigns. Key take-aways from their journey include the persistent need for building strong partnerships with stakeholders to get help with digitalizing the circular business model, but also to get access to know-how, equipment and materials. Several of the participating companies reported that the webinars and workshops during the initiative had been very helpful; however, they pointed to the need for more continuous peer-to-peer advice and assistance to be able to implement and scale up their circular business models.

3.4 The journey of participating citizens

This section describes the journey of participating citizens based on surveys conducted during the initiative. The surveys provide insight into citizens' wardrobe needs and solutions, including indications about the extent to which the challenge resulted in changes in consumer behavior towards a more circular approach prolonging the lifespan of textiles.

3.4.1 The wardrobe survey (December 2023)

Participating citizens started with a wardrobe survey in December 2023 in which they mapped out the content and the characteristics of their own wardrobes. The exercise involved estimating the amount of clothes they owned,^[23] identifying the characteristics of their most-worn and least-worn clothes,^[24] as well as pointing out potential wardrobe needs during the next six months. In total, 74 citizens responded to the pre-survey: 22 from Denmark, 22 from Finland, 9 from Norway, and 21 from Sweden (66 females and 8 males, ranging in age from 21 to 74). The following sections summarize key take-aways from the wardrobe study, focusing on: a) wardrobe size, b) the three most-used pieces of clothing, c) the three least-used pieces of clothing, and d) expected wardrobe needs and solutions during the six-month challenge.

23. The respondents were asked to provide a rough estimate, excluding socks and underwear.

24. This part of the questionnaire was inspired by wardrobe study methods. See, for example, Else Skjold & Johanne Stenstrup (2020) *Klæd dig bedre: En guide til mindre tøjspild og mere garderobeglæde* (Gyldendal) and Kate Fletcher & Ingunn Grimstad-Klepp (2017) *Opening up the wardrobe: A Methods Book* (Novus).

THE WARDROBE STUDY GUIDE

Do you know what's in your wardrobe today?



CHANGE YOUR WARDROBE AND HABITS

Below is a guide that can help change your wardrobe and habits. The five easy steps can help you get a better understanding of the types of clothes you wear the most - and also what you never use. This way you can avoid buying clothes that you never wear.

- 
Find it - Get an overview of where you keep your clothes (closets, drawers, bags, under the bed etc.).
- 
Sort it - Organize all your clothes in piles according to type. (jeans, shirts, dresses etc.)
- 1 2 3**

Count it - Take a note of how much clothes you have and what type of clothes you have most of.
- 
Select your top three - Select three pieces of clothes that you wear the most and write down their characteristics (type, color, fiber composition), and reasons for wearing them so often.
- 
Select bottom three - Select three pieces of clothes that you never wear and write down their characteristics (type, color, fiber composition) and reasons for never wearing these pieces.

Source: The Nordic Textile Collaboration, Wardrobe Survey 2023

Infographic developed by Holm Kommunikation based on the Wardrobe Survey 2023

a) Wardrobe size

Around one quarter of the respondents (26%) estimated they had fewer than 100 pieces of clothing in their wardrobe. A little less than half of the respondents (40%) reported having between 101–200 pieces of clothing in their wardrobe. In comparison, 19% stated that they had 201–300 pieces of clothing in their wardrobes, whereas the remaining 15% of the respondents reported owning more than 300 pieces of clothing. This pattern was more or less the same across the four Nordic countries.

Wardrobe size of participating citizens

Country	0–100 pieces	101–200 pieces	201–300 pieces	300 or more pieces
Denmark	7	9	3	3
Finland	8	7	4	3
Norway	2	5	1	1
Sweden	2	9	6	4
<i>Subtotals</i>	<i>19</i>	<i>30</i>	<i>14</i>	<i>11</i>
<i>Percentage of all respondents</i>	<i>26</i>	<i>40</i>	<i>19</i>	<i>15</i>

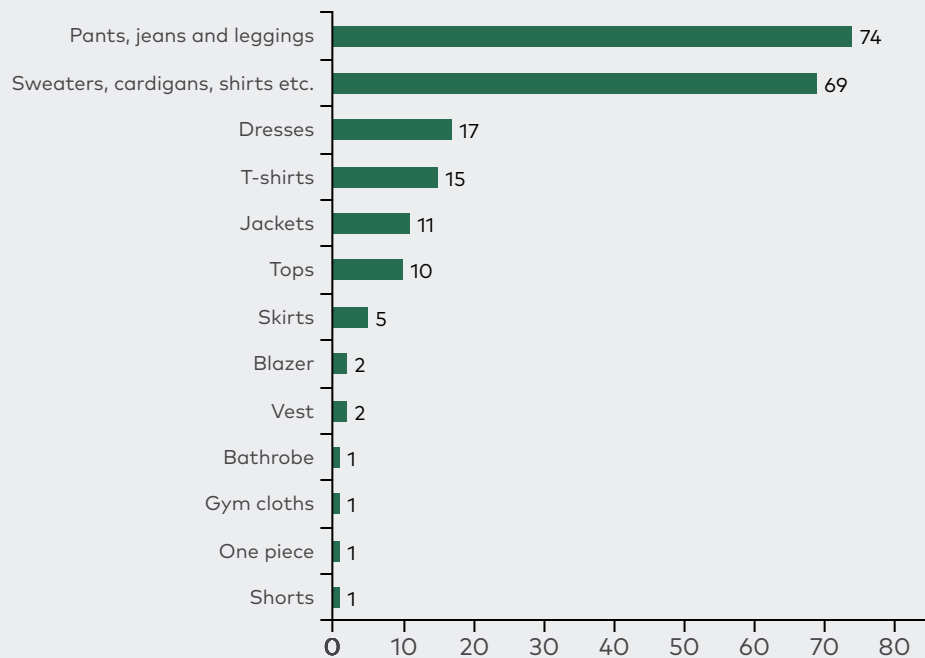
The table shows the number of citizens from each country grouped by wardrobe size. For example, seven participants from Denmark report having up to 100 pieces of clothing in their wardrobe.

Source: The Wardrobe Survey, December 2023

b) The three most-used pieces of participating citizens

In the wardrobe survey, citizens were asked to identify and describe the three pieces of clothing that they use the most. The survey shows that pants, jeans and leggings (35.4% of the responses), long-sleeved shirts and blouses (33% of the responses), and dresses (8.1% of the responses) constituted the top 3 of participating citizens' most-used pieces of clothing, closely followed by t-shirts (7.2% of the responses), jackets (5.3% of the responses) and tops (4.8% of the responses). Few participants reported skirts as the most-used items (2.4% of the responses), whereas blazers, vests, bathrobes, gym clothes, one-pieces and shorts were reported by only 1 or 2 respondents (in total, these categories amounted to 3.8% of the responses).

Most-used clothes among participating citizens



The table shows the categories of clothing that participating citizens have included in their top 3 most used pieces. The numbers in the table refer to the number of times the specific category was mentioned. For example, the items within the category "pants, jeans and leggings" were mentioned 74 times corresponding to 35.4% of the total number of responses.

Source: The Wardrobe Survey, December 2023

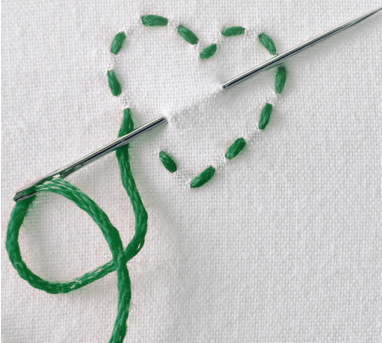
Having identified the most-used pieces of clothing, the participants described key characteristics of these items, including colors, fiber compositions and reasons for wearing them so often. The survey shows that the majority of the most-used pieces of clothing were one-color pieces in black, blue, gray or white (68% of the pieces). In comparison, pieces with more than one color amounted to 13% of the most-used clothes. When it came to fiber composition, the most-used clothes typically contained lots of cotton (26% of the most-used clothes were made from 100% cotton, and 22% consisted of a mixture of fibers with at least 50% cotton). In comparison, 12.5% of the most-used clothes were made from a blend that mostly contained polyester (at least 50% polyester).

The main reasons for wearing the pieces so often included that the clothes were comfortable to wear (19% of the responses), were weather-appropriate (16% of the responses), and were adaptable, i.e., they were easy to combine with other pieces and easy to use in many different contexts, such as for work and festive occasions (14% of the responses):

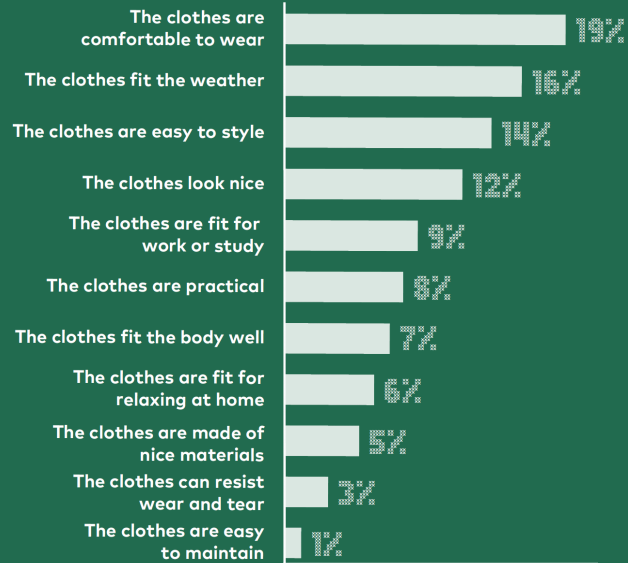
DESIGN FOR EMOTIONAL DURABILITY

Designers should not only design clothes based on basic needs such as warmth and durability. They also need to look at emotions.

For citizens participating in The Nordic Textile Collaboration, the most common reasons for using their favorite clothes are that they're comfortable, easy to style and fit the weather.



WHAT CHARACTERIZES THE ACTIVE CLOTHES IN NORDIC WARDROBES?



Source: The Nordic Textile Collaboration, Wardrobe Survey 2023

“ The cardigan is the result of a 3-year search. I bought it this summer and I use it every week. It's classic, pretty and a comfortable layer. ”

- Ella, Finland

“ Stretchy, comfortable. Makes me feel like a normal person who cares just a little about my appearance. Often used when I am meeting with someone or just to boost my own spirit here at home. ”

- Mette, Denmark

“ A very comfortable and multifunctional piece that works both for sport activities and everyday life. It's minimalist and easy to match with other pieces. Works year round. ”

- Erika, Sweden

“ It's warm! I live in a cold place and prefer to wear wool clothing from October to April. Also nice and comfy + nice color that fits with everything. Suitable for work. ”

- Ida, Norway

Source: The Nordic Textile Collaboration, Wardrobe Survey, 2023

The infographic displays quotes from participating citizens describing key characteristics of their most used clothes.

Infographic by Holm Kommunikation based on the Wardrobe Survey 2023

Pictures exemplifying most-used clothes

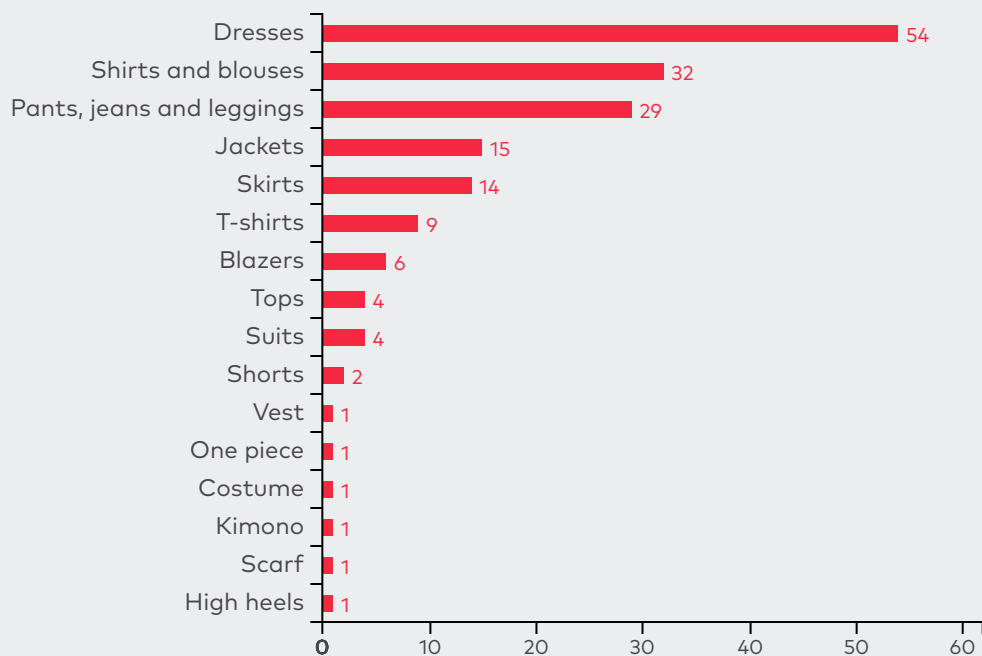


Pictures submitted by participating citizens
Source: The Wardrobe Survey, December 2023

c) The three least-used types of clothing in the wardrobe of participating citizens

The survey shows that dresses (31.3% of the responses), long-sleeved shirts and blouses (18.2% of the responses) and pants, jeans and leggings (16.5% of the responses) constituted the top 3 of participating citizens' least-used pieces of clothing. The top 3 were closely followed by jackets (8.5% of the responses), skirts (7.9% of the responses), t-shirts (5.1% of the responses), blazers (3.4% of the responses), and tops and suits (each corresponding to 2.3% of the responses). Shorts, vests, one-pieces, costumes, kimonos, scarfs and high heels were reported by only one or two respondents (in total, these categories amounted to 3.4% of the responses).

Least-used clothes among participating citizens



The table shows the categories of clothing that participating citizens have included in their top 3 least used pieces. The numbers in the table refer to the number of times the specific category was mentioned. For example, dresses were mentioned 54 times corresponding to 31.3% of the total number of responses in this part of the questionnaire.

Source: The Wardrobe Survey, December 2023

Interestingly, the same types of clothing (pants, shirts and dresses) appeared in the top 3 for most-used and least-used pieces. Dresses, however, were much more prominent among the least-used pieces, taking first place (31.3%) compared to third place among the most-used pieces (8.1%).

There were also only minor differences between most-used and least-used clothes when it came to colors. As with the most-used clothes, the majority of the least-used clothes were one-color in black, blue, gray or white (53% of the pieces) and pieces with more than one color amounted to 13% of the least-used clothes. When it came to fiber composition, the least-used clothes were characterized by high levels of polyester (16% of the least-used clothes were made of 100% polyester and 13% of the least-used clothes consisted of a blend of fibers with at least 50% polyester), as well as cotton (21% of the least-used clothes were made from 100% cotton). Thus, there seemed to be a tendency among participating citizens to have more polyester-based clothing in the pile of least-used clothes compared to the pile of most-used clothes.

The main reasons for never wearing these pieces included that the clothes did not fit (36% of the responses), there was never an occasion for wearing them (20% of the responses), and the clothes did not fit the owner's personal styles (19% of the responses):

40% OF ALL CLOTHES ARE INACTIVE

According to The Danish Consumer Council 40 % of clothes owned by consumers from 25 to 50 years are inactive or passive*. This represents a significant use of energy and wasted materials.

Why don't we use our clothes?

As part of The Nordic Textile Collaboration, 61 Nordic citizens were asked about their inactive clothes. The reasons for not using specific items revolve around two main categories:

- **Tactile** - bad fit and missing comfort
- **Aesthetics** - missing inspiration about when to use and how to style it.

* Source: Katja Schlesinger, Norion

WHAT CHARACTERIZES THE PASSIVE CLOTHES IN NORDIC WARDROBES?



Source: The Nordic Textile Collaboration, Wardrobe Survey 2023

Infographic developed by Holm Kommunikation based on webinar presentation and the Wardrobe Survey 2023

Thus, the survey indicates that the least-used parts of citizens' wardrobes were not comfortable to wear as they did not fit the respondents' body types and personal style, and they were not adaptable to the different situations and occasions that unfolded in the respondents' lives. In this way, the least-used parts of the wardrobes seemed to suffer from not having the qualities characterizing the most-used items.

Comparing most-used and least-used wardrobe items among Nordic citizens

	Most-used pieces of clothing	Least-used pieces of clothing
Types (The top 3)	Pants, jeans and leggings Long-sleeved shirts and blouses Dresses	Dresses Long-sleeved shirts and blouses Pants, jeans and leggings
Dominant colors	Black, blue, gray and white	Black, blue, gray and white
Dominant fibers	Cotton Polyester	Polyester Cotton
Reasons for using and not using, respectively	Fit and comfortable to wear Adaptable to many occasions Easy to maintain	Misfitting and uncomfortable to wear Not suitable for various occasions Hard to maintain

Pictures exemplifying least-used clothes



Pictures submitted by participating citizens

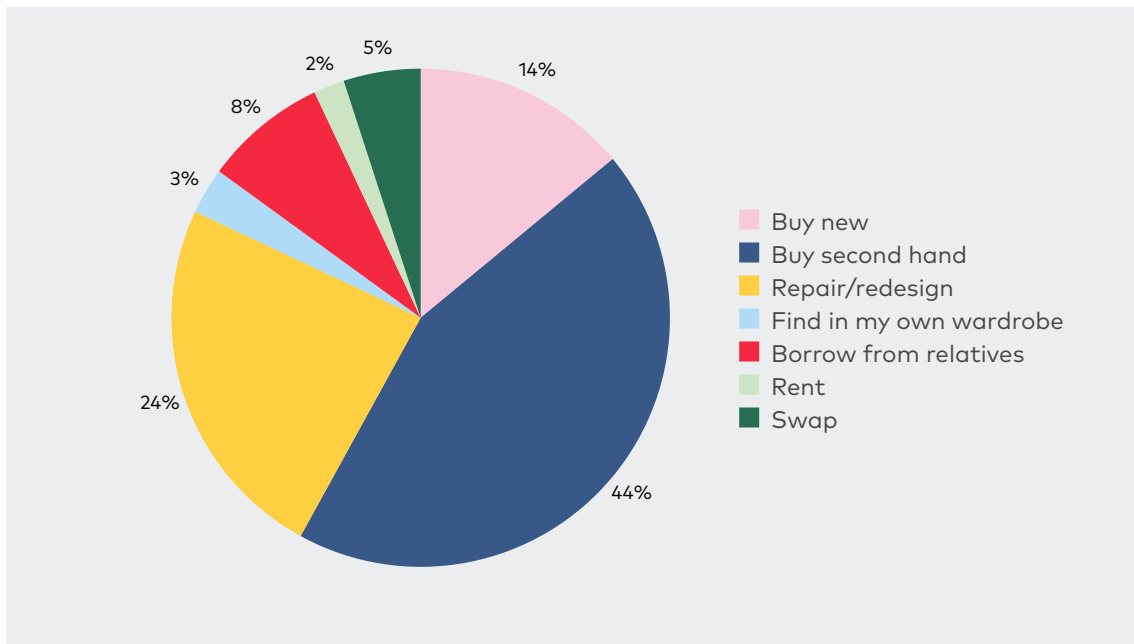
Source: *The Wardrobe Survey, December 2023*

d) Wardrobe needs and solutions before the six-month challenge

57 citizens responded to this part of the survey, of whom 45 foresaw that they would have specific wardrobe needs during the six-month challenge. The remaining 12 citizens did not foresee any needs. Three of the 12 citizens with no needs elaborated that this was because they already had what they needed in their wardrobe.

Looking through the list of expected needs, four types of clothing stand out: The need for new pants, jeans or leggings (26.4% of the needs), followed by dresses (10% of the needs, often for special occasions like weddings and graduations), jackets (9.2%) and shoes (8.5%).

Based on the list of expected wardrobe needs, citizens indicated how they intended to meet these needs during the period January–June 2024:



Source: *The Wardrobe Survey, December 2023*

As shown in the figure above, in December 2023, participants expected to solve 44% of their wardrobe needs by shopping secondhand, whereas participants anticipated to solve 24% of the needs by repairing or redesigning what they had in their existing wardrobe. Furthermore, the participants responded that they would probably have to solve 14% of their needs by buying new textile products. A few needs were intended to be solved by means of borrowing (8%), swapping (5%), restyling existing wardrobe pieces (3%) or renting (2%).

3.4.2 Results from citizen logs (January–June 2024)

During the six-month challenge, citizens filled out monthly logs about how they fared, emphasizing what type of wardrobe needs they faced and how they solved these needs. The following sections present findings from the monthly logs, comparing these with the findings from the pre-survey described above.

Findings regarding wardrobe needs

Each month during the six-month challenge, citizens were asked to describe wardrobe needs during the month. Based on an analysis of their descriptions of needs in the logs, it becomes clear that the reasons for having wardrobe needs fall into three types of categories:

1. **Not present:** What participating citizens wanted to wear was not part of their wardrobe (e.g., due to weather changes). More than half of the wardrobe needs (58.4%) identified were justified with reference to the fact that the specific type of clothing was missing.
2. **Damage:** What participating citizens wanted to wear was damaged and needed repair. Around one third of the wardrobe needs (32.3%) were caused by damage to existing clothes.
3. **Misfit:** What participating citizens wanted to wear no longer fitted. Approximately, one of ten wardrobe needs (9.3%) was related to fit: In other words, the respondent already owned a similar garment which was not damaged, but it didn't fit the respondent.

	January	February	March	April	May	June	Total	%
Not present	25	18	23	10	12	6	94	58.4
Damage	17	8	11	9	7	0	52	32.3
Misfit	8	2	1	3	1	0	15	9.3
Total	50	28	35	22	20	6	161	100.0

The table shows wardrobe needs during the six-month challenge grouped by the three categories of "not present", "damage" and "misfit". The numbers in the table refer to the number of times each of the reasons has been mentioned. For instance, 25 wardrobe needs in January were justified using the argument that the specific type of clothing was not present in the wardrobe.

Source: Citizen logs January–June 2024

Common for all logs was that some citizens did not experience any needs at all, for instance, because they were satisfied with the content of their existing wardrobes:

”

I simply figured what I have is good enough.

Carl, Denmark, March 2024

”

No needs to buy anything yet as my wardrobe is still big enough for my needs.

Johanne, Norway, April 2024).

Other citizens reported having a wardrobe that fulfilled all needs but that they were nevertheless having this feeling of being unsatisfied with the content of their existing wardrobes:

”

I have thought a lot about my wardrobe, because of this project. I don't really need more clothes, because I have a lot, but I sometimes feel like I don't have the "right thing" to wear. I think I miss clothes that I feel appropriate to wear for work. My style has also changed a bit, and some of my clothes are a bit too worn out.

Stina, Sweden, January 2024

”

No specific needs. There is an emotional challenge, though. I own enough clothing, but I find mornings difficult and end up wearing the same 10–15% of my clothing every day.

Ella, Finland, June 2024

Findings regarding solutions to wardrobe needs

The participating citizens used different solutions to accommodate the identified wardrobe needs. Seven types of solutions were mentioned in the logs during the six-month challenge:

1. Using existing wardrobe
2. Borrow
3. Swap
4. Rent
5. Repair/redesign
6. Secondhand
7. Buying new

Interestingly, the solutions applied during the six-month challenge are somewhat different from the solutions anticipated in the Wardrobe Survey from December 2023. As illustrated in the table below, a growing number of citizens accepted their existing wardrobe during the six-month challenge; borrowing, swapping, rentals, repair and redesign matched expectations, while the actual use of the secondhand market turned out to be lower than expected: In December 2023, 44% of needs were expected to be solved using second-hand market finds, but it never went higher than 18% except in June, when 50% of the needs were solved using second-hand stores.

Solutions to wardrobe needs applied by participating citizens in Active Textile Society

	December	January	February	March	April	May	June
Using existing wardrobe	3%	26%	18%	40%	14%	40%	17%
Borrow	8%	2%	-	-	-	-	-
Swap	5%	4%	3%	-	4%	-	-
Rent	2%	2%	-	-	-	-	-
Repair/redesign	24%	30%	25%	11%	14%	30%	-
Secondhand	44%	14%	18%	11%	18%	10%	50%
Buying new	14%	8%	18%	29%	23%	5%	17%
Unsolved	-	14%	18%	9%	27%	15%	17%
<i>Total</i>	100%	100%	100%	100%	100%	100%	101%*

*Percentages have been rounded and therefore they do not total to 100%.

The table provides an overview of solutions applied by participating citizens to fulfil wardrobe needs during the six-month challenge. For example, 30% of the wardrobe needs identified in January 2024 were solved using repairs and/or redesign methods.

Sources: *The Wardrobe Survey December 2023 and Citizen logs January-June 2024*

Tendencies during the six-month challenge documented in the monthly citizen logs can be summarized as follows:

- Poor fit and damages caused the vast majority of wardrobe needs.
- Using existing wardrobes only satisfies citizens to some extent (never more than 40% of the needs)
- Borrow, swap and rentals were used very little (never exceeded more than 4% of the needs)
- Repair and redesign feature often (between 11–30% of the needs are solved using these options)
- Secondhand features quite often (solved between 11–18% of needs in January–May and 50% in June)
- Buying new pieces of clothing was not avoided (used as a solution to changing wardrobe needs in 8–29% of the cases). When citizens bought new clothes, it was often due to the need for underwear, swimsuits or clothes for special occasions. Those citizens reported that they had tried to look for swimsuits and clothes for special occasions in second-hand shops, both physical and online stores, to no avail. Seasonal shifts also seemed to matter as the highest rates of new buys were observed in March and April where many citizens reported being in need of spring and summer clothes. Thus, new wardrobe needs seem to arise when a seasonal change occurs.
- Unsolved needs were widespread and constant.

Pictures showing examples of solutions during the six-month challenge:



1.



2.



3.



4.



5.

Jeans repaired with patches

1. Jeans repaired with patches
2. Gloves repaired with stitches
3. Pants and blouse redesigned into a suit
4. Two pairs of jeans redesigned into a skirt
5. Shirt repaired with embroidery

Pictures submitted by participating citizens
Source: *The Wardrobe Survey, December 2023*

3.5 Sub-conclusions

Active Textile Society initiative examined what it takes to extend the lifespan of textiles with a focus on the nexus between circular business models and consumption cultures.

The initiative revealed that a combination of **repair**, **redesign** and **product care** efforts constitute the very foundation for extending the user phase. Repair, redesign and product care efforts reduce the need for acquiring new textiles, and, at the same time, these efforts make knowledge and skills related to handicraft become part of citizens' daily habits. When designing interventions that support repair, redesign and product care, it is important to pay attention to the reparability scale (see [Section 3.2.3](#)), ensuring that solutions are equally available for simple, demanding and impossible repairs. For repairs that are simple, the first step is to educate citizens and ensure easy access to equipment and materials, while more demanding repairs would require an easy overview of professional services while promoting the use of warranty rights. Repairs that are impossible may be solved by methods of redesign, either by citizens themselves requiring the same interventions as simple repairs (education and access to equipment and materials), or by professionals, which require access to professional services.

During the six-month challenge, several participating citizens managed to make several simple repairs and redesigns themselves using tutorials from the project webinar or other existing sources, which underscores the fact that education and access to hands-on tools are necessary (see [Section 3.4](#)). The six-month challenge also made some participants look for professional help with repairs and redesigns, but with varying degrees of success: Some had to give up as it wasn't clear where or who to turn to and/or the prices were not sufficiently transparent, underscoring the need for interventions that ease access to professional services.

Also, during the six-month challenge, one of the participating companies made an attempt to improve its repair services (see [Section 3.3](#)). The company mentioned time pressure as a key challenge, i.e., customers often did not understand that demanding repairs are time-consuming. This experience indicates a need for change in perceptions and better matching of expectations between companies and consumers.

Secondhand markets also provide an opportunity to extend the lifespan of textiles (however, there will only be environmental gains if second-hand sales replace new products). The second-hand markets consist of entire ecosystems comprised of different models for resale and reuse, meeting different needs and consumer segments (see [Section 3.2.4](#)). To improve these models and make them widely available and appealing, participants identified the need for establishing overviews of the different second-hand platforms and stores by, for instance, developing city maps and promoting them.

Also, it was recommended that the organization of second-hand stores should be reconsidered to make the shopping experience better (focusing on lighting, smell, and presentation of clothes to make it easier for people to find what they are looking for). These steps require resellers to develop skills in organizing their stores, listing second-hand clothing well and ensuring accurate pricing across different platforms.

The six-month challenge brought most of the participating citizens to second-hand stores to acquire clothes – some did it for the first time, while others were very familiar with reuse and resale options (see [Section 3.4](#)). A concern raised by many of the citizens was that they needed to be very patient when shopping second-hand, accepting that they sometimes needed to visit several second-hand stores, both physical and online stores, to find what they were looking for – and sometimes they simply had to give up. In this connection, it is important to note that the participating citizens did not see themselves as being picky about the clothes they wanted, but that they reported experiencing the second-hand market as very confusing and poorly organized.

During the six-month challenge, one of the participating companies tried to improve its resale model (see [Section 3.3](#)). However, the company reported that the lack of data on production and user phases made it difficult to sell second-hand clothes. This experience shows that for resale to grow as a business model, companies need support in building data systems that enhance the transparency and traceability of products.

Rental was another circular business model tested during the initiative as a method for extending the lifespan of textiles. Rental models build on the principles of product service system (PSS, see [Section 3.2.1](#)) enabling more users per product. Webinars revealed that rental models must be organized carefully to provide added value and make them appealing to citizens. It is crucial to identify the customer segment and design the service model in accordance with their needs, price incentives, etc. Participants emphasized the need to raise awareness and increase convenience and affordability to make rental services appealing. At the same time, efforts should be made to provide incentives for using rental services and support this through legislation. Most participants also stated that they found rental services appropriate for workwear and clothes for special occasions, but not everyday clothes. Maternity and children's clothes were mentioned as ideal categories of clothes for a rental service, as these types of garments are often used for a limited period of time. During the six-month challenges, rentals were the least-used option (see [Section 3.4](#)), underscoring that rentals as a business model may serve some applications and situations, but not all.

Styling was the final approach to textile lifespan extension investigated in the initiative. Webinars revealed that styling strategies ensure activation of the wardrobe and thereby reduce the need to shop for new items. Styling strategies imply organizing the wardrobe in building blocks, using clothing codes and the three-color-rule (see [Section 3.2.5](#)). Participants emphasized the need to make these tips widely available and educate citizens in using wardrobe clean-ups and outfit picking as a social event, just like a shopping trip with friends. During the six-month challenge, many of the participating citizens reported having benefited from getting a better overview of their wardrobes and successfully activated their existing wardrobes as an alternative to new buys (see [Section 3.4](#)). At the same time, only a few participants reported having tried out professional stylist services, indicating that styling as a business model is somewhat overlooked: companies could provide styling as a service to educate citizens about how to organize and activate their wardrobes in ways that extend the lifespan of each piece of clothing in their wardrobe.

One key issue cutting across all discussions about the potential of circular business models was the challenge of ensuring **environmental gains**. A repeated message communicated by all presenters was that circular business models only generate environmental gains if they contribute to the reduction in production and consumption of new textiles. Put differently, the offering and use of circular solutions have to replace the promotion and shopping of new textiles if the aim is to reduce the environmental impact of the fashion and textile industry. Acknowledging this connection implies improving the availability and quality of circular business models to allow them to compete with conventional business.

In conclusion, Active Textile Society managed to bring together companies and citizens in a joint effort focusing on lifespan extension of textiles. The results were manifold. First, it established a sense of community enabling knowledge sharing and the development of new insights about the nexus between circular business models and consumption, including barriers hindering a circular textile economy from emerging and ideas about how to overcome these barriers. At the same time, the six-month challenge brought about changes in consumer behavior and business models due to, inter alia, the openness and willingness of participants to share experiences and inspire each other.

CHAPTER 4: SHARING NORDIC CIRCULAR COMPETENCES

This chapter consists of three sections. Section 4.1 describes the thoughts behind the initiative and its organization. Section 4.2 runs through the different topics investigated during webinars, sharing key takeaways from each of these topics. Section 4.3 summarizes findings from the initiative as a whole.

4.1 About the initiative

The mapping report (see [Chapter 2](#)) highlighted the need to address competence gaps related to circular transition in the fashion and textile industry. The mapping also showed that while each Nordic country has unique expertise and know-how in specific areas of the textile value chain, this expertise and knowledge has not necessarily been shared across the Nordics. Sharing Nordic Circular Competences sought to fill these gaps by establishing a new Nordic network bringing into focus circular design, recycled materials and best practices for collecting, sorting and treating textile waste. In this way, the initiative supported the development of circular competences in Nordic companies and organizations, with a focus on the nexus between design and textile waste.

Sharing Nordic Circular Competences was aimed at professionals and had more than 100 sign-ups. Each webinar was attended by 20–43 participants from across the Nordics and mainly comprised of companies and organizations but also sparked the interest of a smaller group of citizens.

The initiative involved a series of webinars focusing on selected topics that led the participants through the value chain from the textile waste bin to the global production and supply chain perspective (see the program below).^[25] The format was selected in an effort to bridge knowledge gathered from across the value chain, with an emphasis on recyclers and designers getting a better understanding of each other's work. During the webinars, participants gained access to cutting-edge research and knowledge, as well as the opportunity to meet and interact with peers across the Nordic countries. Relevant presenters were identified for the webinars using the mapping report (see [Chapter 2](#)), as well as advice from affiliated partners to the project, including the steering committee and the reference group. All presenters were chosen based on their expertise, having worked on the selected topics for years and being able to present the latest cutting-edge knowledge. Webinar presentations were recorded and made available on the project website, together with slides from the presentations to the extent possible.^[26]

25. The activities were originally structured as 2.5-hour sessions featuring webinars followed by a workshop. This was later changed to two-hour sessions as webinar-only, with a different structure, to better accommodate the question and debate part that flowed naturally after each presentation.

26. The webinar presentations were recorded, and both recordings and slides are available online on the project website: <https://mst.dk/erhverv/groen-produktion-og-affald/affald-og-genanvendelse/affaldshaandtering/affaldsfraktioner/tekstilaffald/the-nordic-textile-collaboration>

Sharing Nordic Circular Competences: The Programme

26 October 2023

13.00–15.30 (CET)

Wasted textiles

What do we know about the user perspective and content of textile waste, including collection and sorting?

17 January 2024

13.00–15.30 (CET)

Design and recycling

How do we ensure the right quality of recycled fibers?
How do we make clothes and textiles that are recyclable, and how can we use recycled fibres when designing new clothes?

10 April 2024

13.00–15.30 (CET)

Processing and production

How can we replace conventional methods with methods that have less environmental impact, using digital tools to produce on demand and customize products to fit citizens' needs?

12 June 2024

13.00–15.30 (CET)

Digitalization and traceability

How can we use digital tools to trace the life of textile products?

14 August 2024

13.00–15.30 (CET)

Global perspectives

How can we adapt the supply chain to support the transition towards a circular economy?

4.2 Key take-aways from webinars

In the following sections, each webinar from Sharing Nordic Circular Competences will be explored. Key lessons and take-aways will be presented, addressing the barriers and solutions to circular transition in the fashion and textile industry.

4.2.1 Webinar about wasted textiles

The webinar investigated the following question: *What do we know about the user perspective and content of textile waste, including collection and sorting?* The webinar included four presentations:

Webinar about wasted textiles, 26 October 2023

Wasted Textiles by Anna Sigaard, PhD Student, Consumption Research Norway (SIFO), OsloMet. Learn more about the project here: <https://clothingresearch.oslomet.no/wasted-textiles/>

What can we learn from the textiles in the waste bin? by Nynne Nørup, Assistant Professor, Industrial PhD, Department of Planning, Aalborg University Copenhagen. Learn more about the project here: <https://vbn.aau.dk/da/publications/development-and-testing-of-a-sorting-and-quality-assessment-metho>

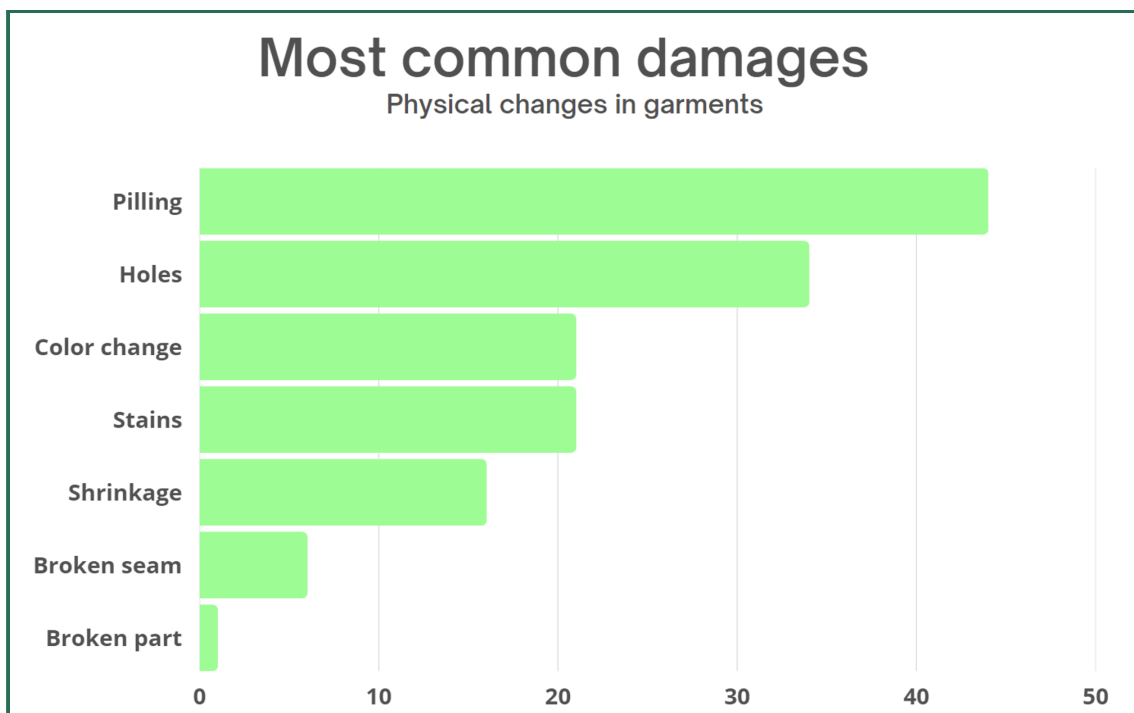
Separate end-of-life textile collection, sorting and solutions by Anna Garton, Post-Consumer Textile Expert, Lounais-Suomen Jätehuolto Oy (LSJH). Learn more here: <https://postconsumertextile.com>

The challenges and possibilities of sorting and collecting textiles by Rustan Nilsson, Communications Officer, Sysav. Learn more here: <https://www.sysav.se/foretag/produkter-tjanster/siptex>

Take-aways from "Wasted Textiles"

Presentation by Anna Sigaard

Anna Sigaard has investigated what types of textiles people dispose of and why. Through interviews and sorting analyses of 28 households, she was able to uncover the characteristics of textile items that would otherwise be discarded, recycled or reused. She found that the condition of discarded items varied widely, with 41% of items deemed to be "like new" or with only minor damages, while 28% were deemed not useable or with oil stains or large holes. The most common types of damage included pilling^[27] and holes.



Source: Webinar presentation. Find slides and recordings on the [project website](#).

The study also discovered a distinct correlation between damage and the reasons for clothing disposal, but suggested that some types of damage are more tolerable than others for the wearer. Roughly half of the items were disposed of because of their physical condition, while the other half were discarded because of poor fit or a lack of perceived value, such as style, lack of occasion or simply because they were replaced by new items. This led Anna Sigaard to the conclusion that non-physical aspects are important reasons for people discarding textiles and that improved physical durability is not a sufficient means to solve the issue.

27. 'pilling' refers to clusters of tangled fibers that create small balls and bumps on fabric surfaces. It happens when fibers rub against each other or other surfaces. <https://www.testtextile.com/understanding-fabric-pilling-which-fabrics-are-prone-to-pilling/>

Take-aways from "What can we learn from the textiles in the waste bin?"

Presentation by Nynne Nørup

Nynne Nørup's study was aimed at improving the waste management system by studying the textile content of Danish residual waste and the small combustibles fraction.^[28] Her sorting analysis revealed that residual waste contained 1.4% clothing and 0.6% household textiles equivalent to 2.4 kg clothing and 1.1 kg household textiles per citizen annually. Small combustibles included 4.5% clothing and 2.5% household textiles, equivalent to 1.7 kg of clothing and 1.0 kg of household textiles per citizen annually. The total came to just over 40% of the yearly consumption of clothing and household textiles.

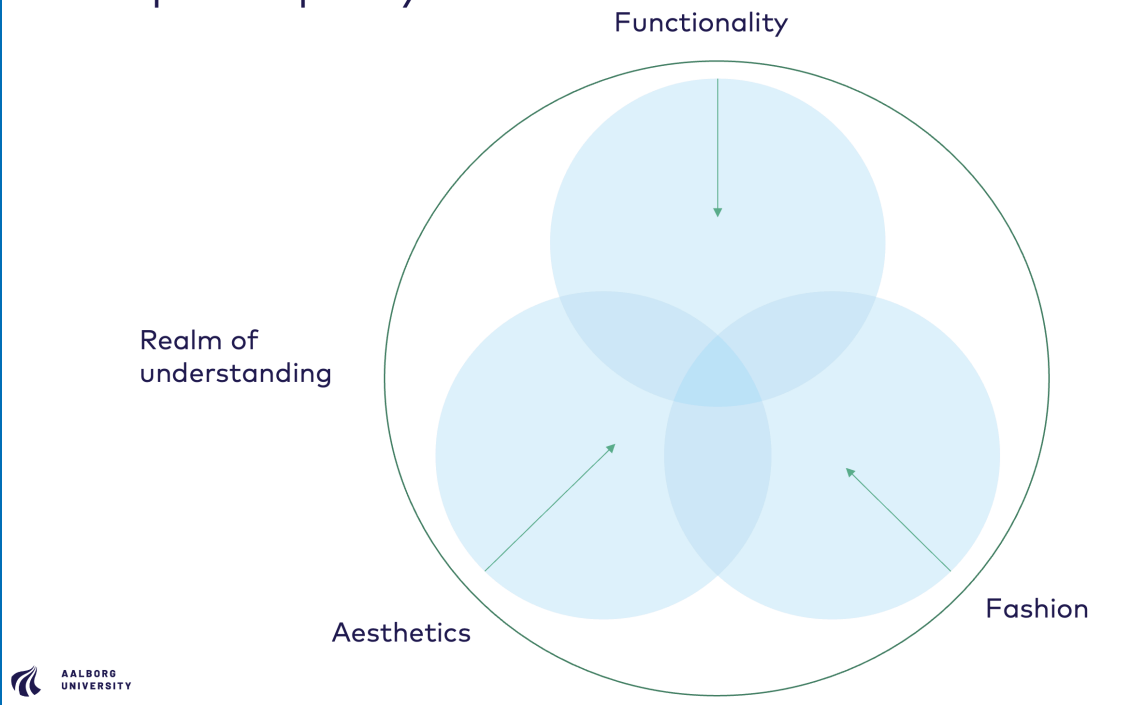


Infographic developed by Holm Kommunikation based on webinar presentation

The quality of discarded items was high, with 77–83% being suitable for reuse. This led Nynne Nørup to investigate the notion of quality, and she argued that the concept must include a combination of functionality, aesthetics and fashion to be understood. According to Nynne Nørup, the study findings challenge conventional understandings of 'quality' in waste management, and indicate that stakeholders need to consider a multitude of factors when assessing the reusability of discarded textiles.

28. Former Danish waste fraction, used to categorize small waste items that could be incinerated for energy recovery, such as non-recyclable waste.

Concept for quality



Source: Webinar presentation. Find slides and recordings on the [project website](#).

Take-aways from "Separate end-of-life textile collection, sorting and solutions"

Presentation by Anna Garton

Anna Garton shared her experience with handling textile waste at Lounais-Suomen Jätehuolto Oy (LSJH). LSJH is a Finnish municipal waste management company involved in collection, sorting and processing of textile waste. Finland has required separate collection of textile waste since January 2023, but LSJH has operated a mechanical fiber opening facility since 2021 and processed 743 tons of textiles in 2022 alone.

One of the key business activities of LSJH is material-based sorting. According to Anna Garton, material-based sorting is key to finding the right application for the fibers, as not all fibers are usable for producing new textiles; some fibers might be usable for yarn production, while others are better suited for insulation panels or padding for furniture. Anna Garton stressed that recycled fibers cannot be used in exactly the same way as virgin fibers, and the industry therefore needs to come up with new designs, products or processes in order to utilize recycled fibers.

According to Anna Garton, LSJH sees mostly natural fibers in their sorting, which has led them to the conclusion that what they collect at the moment does not reflect what is currently being sold in stores. LSJH expects the share of synthetic fibers in their operation to increase in the future. The company also expects to see a change in the market in 10 years, with more demand for recycled fibers than supply. This means a total shift as the current market is characterized by very low demands for recycled fibers.

Key lessons from LSJH's business operations so far are condensed in the infographic below:



Infographic developed by Holm Kommunikation based on webinar presentation

In terms of achievements, Anna Garton highlighted that through investment in communication, LSJH has managed to bring down the quantity of reusable textiles in the textile waste fraction to just 3 percent. She also advised waste management companies not to take any short-cuts when collecting and sorting textile waste, as, for example, manual sorting is still a necessity. Finally, she emphasized that while the EU Textile Strategy is a positive push, the market still needs incentives to engage in the transition towards a circular economy.

Take-aways from “The challenges and possibilities of sorting and collecting textiles”

Presentation by Rustan Nilsson

Rustan Nilsson shared experiences from the Swedish Innovation Platform for Textile Sorting (SIPTEX). SIPTEX is a plant equipped with automatic textile sorting technology owned by the municipal waste company Sysav in Malmö. High-volume textile sorting was seen as a bottleneck in the value chain to make recycling possible and SIPTEX was built to provide this missing link. SIPTEX is able to sort textiles by fiber type and color using NIR sensor technology but has seen little demand for color sorting.

According to Rustan Nilsson, SIPTEX currently faces the following challenges:

- Demand is lacking for the sorted textile waste, making it hard to make sorting profitable.
- Textiles collected in Sweden are currently sent for manual presorting in Estonia. The Estonian sorters keep the reusable textiles, and Sweden buys back the textile waste. SIPTEX will need a presorting step in Sweden in the future but there is currently no manual sorting because of costs and lack of skills.
- SIPTEX is uncertain about the ownership situation of the sorted textiles when Extended Producer Responsibility is introduced on textiles in accordance with the current revision of the EU Waste Framework Directive, yet to be adopted. This comes along with a fear of access to materials if brands start collecting textile waste themselves.
- Recycling is not going to solve the problem on its own because a t-shirt produced with recycled fibers only reduces its climate impact by 1–3%. Thus, consumption must also be addressed.

4.2.2 Webinar about design and recycling

This webinar investigated the following question: *How do we ensure the right quality of recycled fibers? How do we make clothes and textiles that are recyclable, and how can we use recycled fibers when designing new clothes?* It included three presentations.

Webinar about design and recycling, January 17, 2024

[Chemical recycling and reinforcement of fibers by means of the Ioncell\(R\) technique](#), by Inge Schlapp-Hackl, Postdoc researcher, Aalto University. Learn more here: <https://ioncell.fi/>

[Recycling – Status, Challenges and Design](#), by Johnny Rodam, Business manager, Danish Technological Institute. Learn more here: <https://www.teknologisk.dk/>

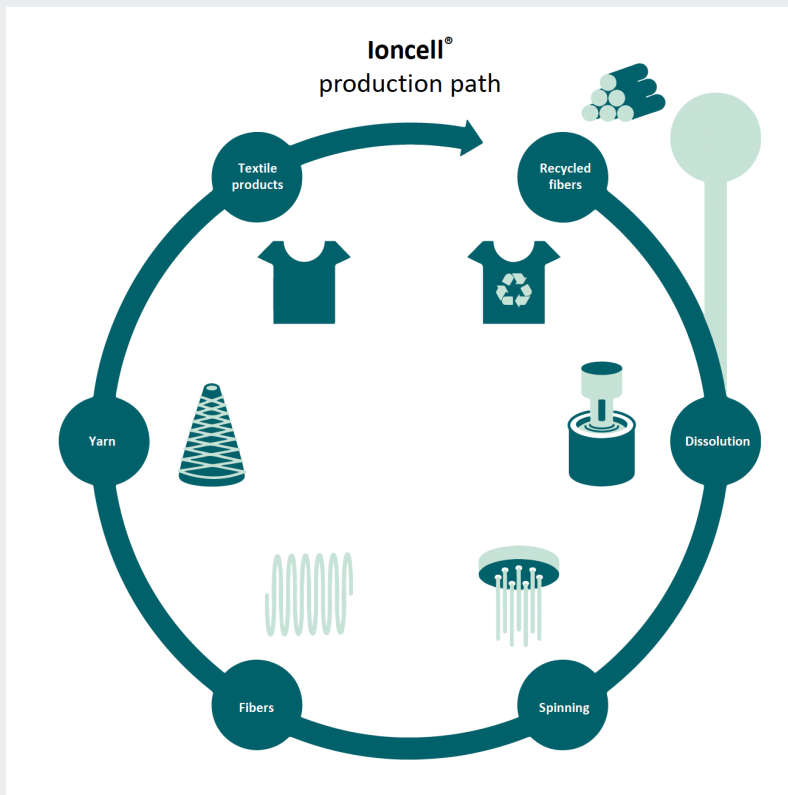
[Circular design strategies for recycled fibers, project Ready](#), by Anne Louise Bang, PhD, Senior Associate Professor in Design & Sustainability, VIA University College. Learn more about the project here: <https://www.ucviden.dk/en/projects/ready-the-local-rd-factory-for-a-global-circular-textile-industry>

Take-aways from “Chemical recycling and reinforcement of fibers”

Presentation by Inge Schlapp-Hackl

Inge Schlapp-Hackl gave a technical presentation of the chemical recycling technique known as loncell and provided an overview of the different processing steps.

loncell is a Lyocell-type technique running at the pilot plant stage. It can treat cellulose-based fibers through the following production path:



Source: Webinar presentation. Find slides and recordings on the [project website](#).

First, the input material is ground and dissolved in an ionic liquid. The dope is melted in a spinning piston and pushed through a spinneret. The fibers are then stretched in an air gap and finally immersed in a coagulation bath. The loncell technique differs from similar techniques in this last step by only using water, thus reducing the use of chemicals.

Recycled loncell fibers show promising properties, with a higher tenacity^[29] (50–60 cN/tex) than comparable fibers and an elongation of 12–15%.

Inge Schlapp-Hackl highlighted that loncell's analysis shows that loncell fibers made from cotton have double the tenacity of a virgin cotton fiber. However, she still believes that chemical recycling should be seen as the last step after a long life of use and reuse including repairs, remakes and using the yarn to create new items.

29. Measure of yarn strength.

Take-aways from "Recycling – Status, Challenges and Design"

Presentation by Johnny Rodam

Johnny Rodam highlighted that mechanical and chemical recycling techniques have different advantages and effects. Mechanical recycling reduces the fiber length and breaks down polymeric chains, resulting in lower numbers of monomers per chain. This increases fragility and creates a tendency to peel, requiring extra twisting in the spinning process to ensure usable yarn strength. It also poses a liability issue in terms of chemical residue in the recycled fibers that are left from the original input. However, the advantage of mechanical recycling is its low use of chemistry and resources in the processing.

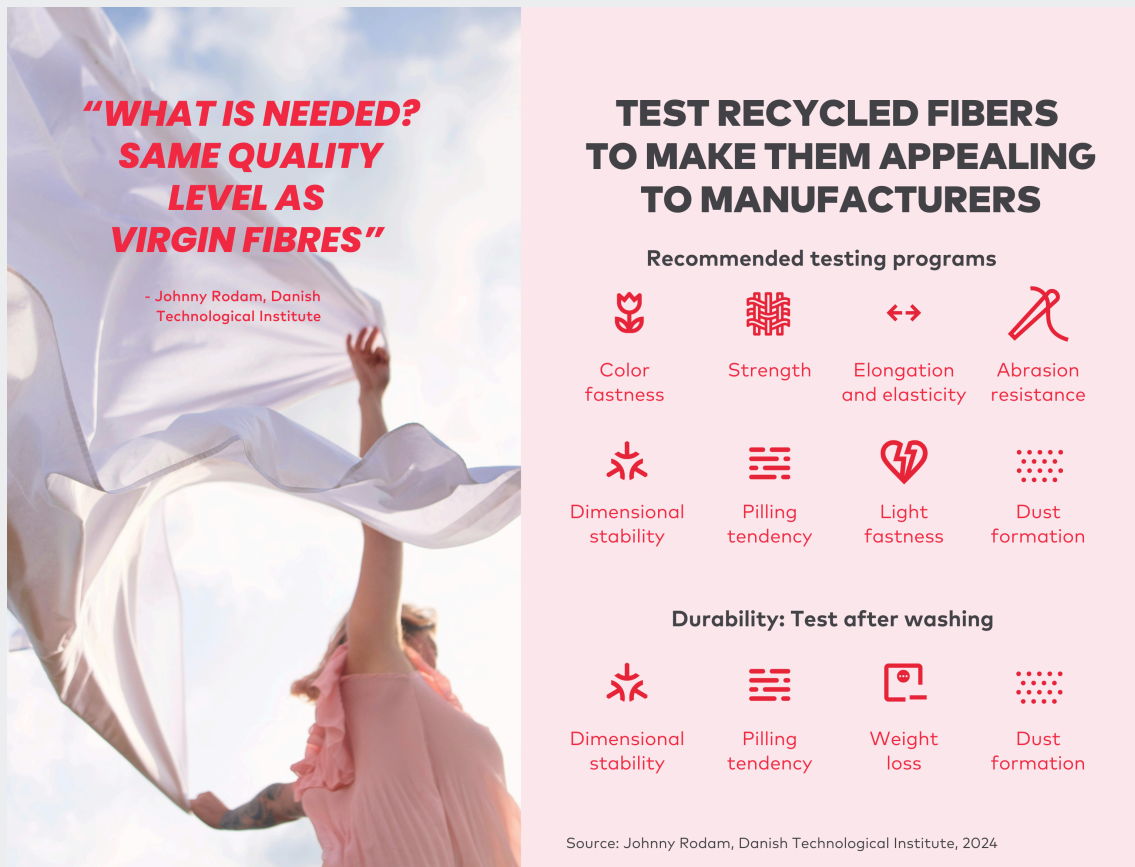
Chemical recycling, on the other hand, can work with any fiber length by breaking down the fibers into monomers and then rebuilding the polymers from that. This can produce output of virgin quality but requires a higher input of chemicals and resources than the mechanical process.

Following infographic shows some distinctions between mechanical and chemical recycling:



Infographic developed by Holm Kommunikation based on webinar presentation

Recycled fibers on the market today come almost exclusively from downcycling of PET bottles and the market demand for recycled fibers from post-consumer textiles is very low. To change this, Johnny Rodam points to better information for the producers on the properties of recycled fibers. A centralized information system offering uniform testing could provide a solution, making producers comfortable with the use of recycled fibers. Johnny Rodam suggested a list of relevant tests:



**"WHAT IS NEEDED?
SAME QUALITY
LEVEL AS
VIRGIN FIBRES"**

- Johnny Rodam, Danish Technological Institute

TEST RECYCLED FIBERS TO MAKE THEM APPEALING TO MANUFACTURERS

Recommended testing programs

 Color fastness	 Strength	 Elongation and elasticity	 Abrasion resistance
 Dimensional stability	 Pilling tendency	 Light fastness	 Dust formation

Durability: Test after washing

 Dimensional stability	 Pilling tendency	 Weight loss	 Dust formation
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Source: Johnny Rodam, Danish Technological Institute, 2024

Infographic developed by Holm Kommunikation based on webinar presentation

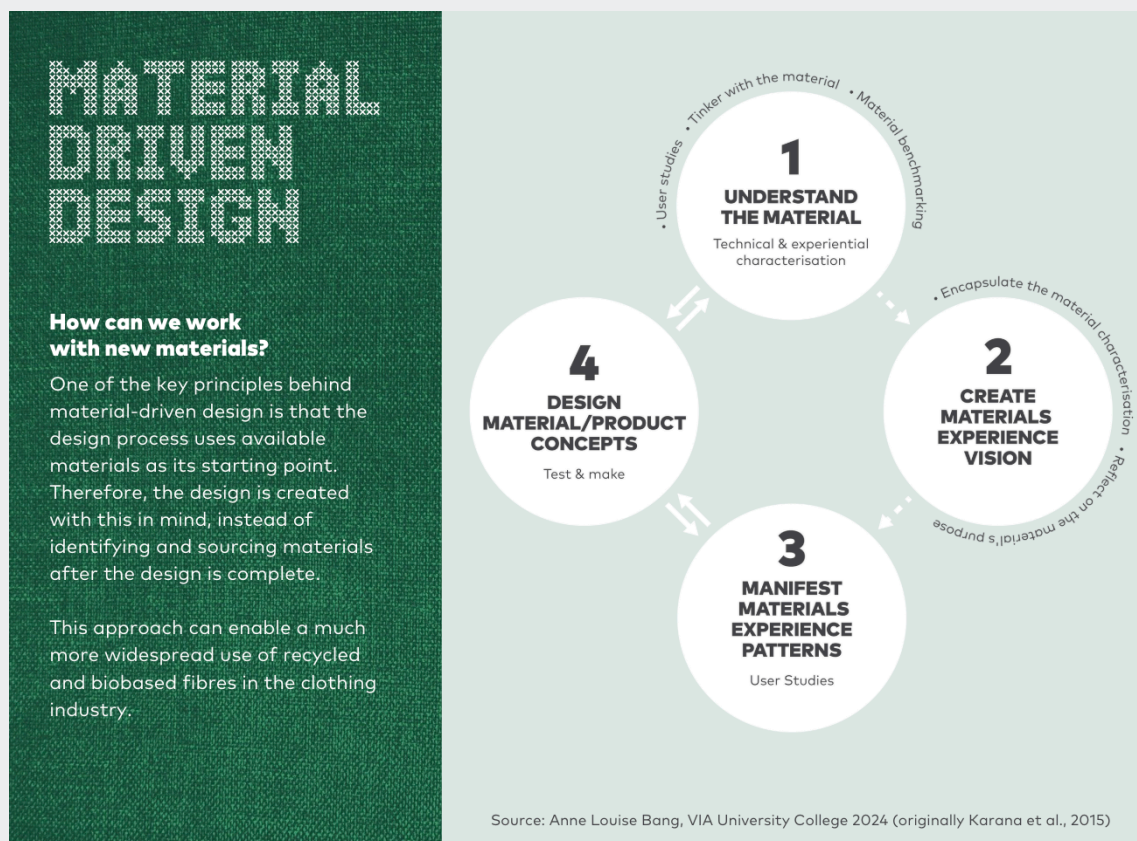
Johnny Rodam finished off with six pieces of advice on better design for recycling:

- Evaluate needed primary properties of your final product
- Which fiber material would best encapsulate your need
- Use single fiber material if possible
- Design areas of increased abrasion for longer durability
- Use recycled material according to your main material type
- Choose accessories accordingly and be aware of how they can be reused or removed.

Take-aways from "Circular design strategies for recycled fibers"

Presentation by Anne Louise Bang

Anne Louise Bang presented the visions for the research project READY, which aims to create a local R&D factory in Denmark to support the transition to a circular global textile industry. The project expects to produce new, material-driven, "design for circularity" strategies, but also aims to investigate how to come up with strategies that are both circular and sustainable. Since circularity is not necessarily sustainable if it does not address the speed of production, Anne Louise Bang emphasizes the need to turn the design phase around and utilize material-driven design, where you start with the material and not with the design.



Infographic developed by Holm Kommunikation based on webinar presentation

The project hopes to address the following three challenges:

- Loss of material in the recycling process
- How to mix virgin and recycled fibers to improve quality
- How to handle color variety

A new spinning mill will be established in Herning, which will make it possible for the project to process textiles through the entire value chain locally. This will be used to investigate new fiber feedstock that can be spun, knitted, woven and printed on directly in the lab. Anne Louise Bang stresses the importance of viewing and testing recycled fibers as if they were a new type of fiber, because they do not necessarily behave like their virgin equivalents. This underlines the need for cross-disciplinary collaboration to investigate the full value chain.

4.2.3 Webinar about processing and production

The webinar investigated the question: *How can we replace conventional processing and production with methods that have less environmental impact?* The webinar included three presentations.

Webinar about processing and production, April 10, 2024

Innovative fiber blends and yarn spinning techniques, by Nawar Kadi, Professor of Textile Technology, University of Borås. Learn more about the project here:

<https://www.bioinnovation.se/en/projekt/innovative-fiber-blends-and-yarn-spinning-techniques-a-part-of-citex/>

Micro Factories – Local small-scale production, by Trine Young, Founder & CEO, Rodinia Generation. Learn more here: <https://www.rodiniageneration.io/>

BioColor – Viable alternatives to synthetic dyes and colorants, by Riikka Räisänen, PhD, Professor of Craft Science, University of Helsinki. Learn more about the project here: <https://biocolour.fi/en/frontpage/>

Take-aways from "Innovative fiber blends and yarn spinning techniques"

Presentation by Nawar Kadi

Nawar Kadi suggested that fiber length is one of the most important properties when recycling textile waste mechanically. Long fibers are the basis of the quality of recycled yarn, but a mechanical shredding process shortens them. The University of Borås has investigated how pre-treatment of textile waste with lubricants can mitigate this fiber-length reduction. By spraying the fibers with a polyethylene glycol (PEG) solution, they found a significant increase in fiber length in cotton, polyester and polycotton. This enables rotor-spun yarn from 100% recycled fibers, but does not significantly increase yarn tenacity, meaning yarns solely made from recycled fibers still have lower strength than yarns made from virgin fibers.

Nawar Kadi presented the project "Innovative fiber blends and yarn spinning techniques", which investigated two important challenges – fiber spinning and fiber mixing. The project studied how to increase the spinnability of mechanically recycled fibers by mixing them with other natural fibers, such as hemp. Nawar Kadi highlighted that a general goal of the market is to achieve a 50/50 mix of virgin and recycled fibers, but it can currently only achieve 70/30. The project showed that it is possible to achieve a 55/45 mix by using hemp fibers and adding finishing to the recycled fiber.

According to Nawar Kadi, spinning techniques are also important to reduce the use of elastane in products, as new techniques can introduce more stretch in a fabric and lower the need for elastane from 5% to 1%.

Take-aways from "Micro Factories – Local small-scale production"

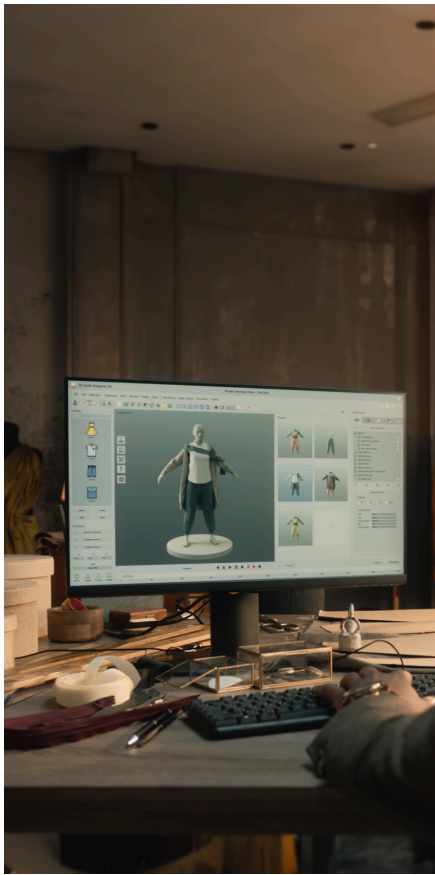
Presentation by Trine Young

A micro-factory sets itself apart from the traditional production chain by delivering flexible on-shore production that is highly automated. Starting with a roll of fabric, it can color and cut garments efficiently, no matter how many unique pieces are being produced, resulting in low environmental impact with no use of water and limited use of resources.

According to Trine Young, the concept has the potential to disrupt the way brands produce textiles because it offers low lead-times (48 hours from order to delivery) and customizability without extra cost. It does not matter whether you need to produce 100 pieces or just 1. This also opens the door to production on demand, where brands can design and sell their garments before they have to produce them; a potentially revolutionary approach that could transform today's value chain.

This method of production has fewer hidden costs such as price erosion and depreciation, but naturally comes with a higher upfront cost. This makes it harder to assure brands of cost saving as it materializes in other sections of their business, e.g., maintaining stock. It does, however, come with clear benefits in traceability, down to the individual t-shirt sleeve.

Technologies still need to mature to allow the use of recycled fibers and for brands to utilize the potential for digital design and production on demand. The micro-factory in Copenhagen also does not have the ability to produce knitwear.



MICRO FABRIQUES

Flexible and Nimble

Micro factories are small automated production lines that can color and cut garments from a roll of fabric. Fast local production makes it highly flexible and opens the door to digital design and production on demand.

Benefits:

- Fewer hidden costs such as price erosion and depreciation
- Provides traceability down to the individual t-shirt sleeve

Drawbacks:

- Higher upfront cost
- Cost savings materialize in other sections of a brand's business e.g. no costs related to maintaining stock

Source: Trine Young, Rodinia Generation, 2024

Infographic developed by Holm Kommunikation based on webinar presentation

Take-aways from "BioColour – Viable alternatives to synthetic dyes and colorants"

Presentation by Riikka Räisänen

Current synthetic colorants on the market can have negative impacts on human health and the environment. Colorants come from the petrochemical industry that utilize aromatic compounds such as benzene, catalysts such as zinc and chrome, and solvents including acids and alkali. The basic process of dyeing cotton, for example, is very complex in itself and consumes a lot of water and energy. After dyeing, testing is often done for color stability and affinity, but rarely for toxicity.

According to Riikka Räisänen, biocolorants, on the other hand, can come from a variety of natural sources, including low-value side streams that would otherwise be wasted. They can create a wide palette of colors and be used on both natural fibers and synthetic fibers for printing, dyeing or mass coloration.

The BioColour project aims to develop new methods of large-scale production of biocolorants, produce a colorful palette of human and environmentally safe natural dyes and establish a database that covers the whole production chain.

INSPIRED BY SWEETS?

One way to make the production of clothes more sustainable is by replacing synthetic colors with natural alternatives. This is already implemented across other sectors such as the food industry, who use natural colors for a wide range of products such as candy.



REPLACE SYNTHETIC COLORS WITH NATURAL SOURCES



Alternatives to conventional dyes come from natural sources including low value side streams. These include agriculture, forest and microbes such as mushrooms.

Natural sources can produce colors in a wide palette of colors.



Consumers need to use delicate laundry detergent to avoid dissolution of the natural colors.

Many natural alternatives have a similar colorfastness as synthetic dyes.



Source: Riikka Räisänen, University of Helsinki, 2024

Infographic developed by Holm Kommunikation based on webinar presentation

Methods investigated in the BioColour project include:

- Waterless textile dyeing using fungal anthraquinones
- Enzyme modification of weld extract
- Acid dyes for wool using dermorubin extracted from mushrooms
- Printing instead of coloring
- Biocolorants from fermentation tanks

According to Riikka Räisänen, there are suitable natural dyes for all fibers, but textile brands and consumers are key for pushing this forward. There is a need for a change of habit at the brand level, where conventional colors are known and effectively make biocolors more difficult to work with. At the consumer level, washing habits have to change, as natural dyes need pH-neutral laundry detergents

4.2.4 Webinar about digitalization and traceability

The webinar investigated the question: *How can we use digital tools to trace the life of textile products?* The webinar included three presentations: first, an overview of some modern digital tools and their innovative application; second, how blockchain technology can improve Nordic traceability and business; and finally, a dive into 3D design strategies and how brands can implement them.

Webinar about digitalization and traceability, June 12, 2024

[Twin transition – green and digital transformation](#), by Jonas Larsson, Associate Professor in Textile Management, University of Borås. Learn more here:

<https://www.hb.se/en/research/research-portal/researchers/JKL/>

[Blockchain – traceability, transparency and circular innovation](#), by Heidi Svane Pedersen, Head of Digital, Lifestyle & Design Cluster. Learn more here:

<https://ldcluster.com/portfolio-item/nordic-blockchain-alliance/>

[3D design strategies](#), by Jon-Amund Søfferud, Technical Manager, Manufacture Oslo.

Learn more here: <https://www.manufacture-oslo.no/>

Take-aways from “Twin transition – green and digital transformation”

Presentation by Jonas Larsson

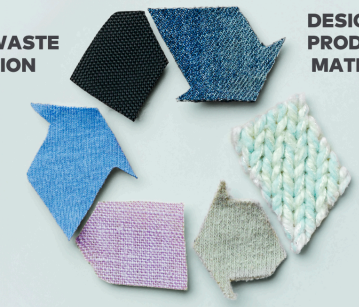
Jonas Larsson presented the project “System demonstrator for a more sustainable textile system.” The project builds on the circular design principles developed by the Ellen MacArthur Foundation. These include three overall elements: circulate material, eliminate waste and regenerate nature.

CIRCULAR DESIGN PRINCIPLES

The three principles below can help designers push the clothing industry in a more sustainable direction.

DESIGN TO ELIMINATE WASTE AND POLLUTION

DESIGN TO KEEP PRODUCTS AND MATERIALS IN USE



DESIGN TO IMPROVE BIODIVERSITY, AIR, AND WATER QUALITY

Source: Jonas Larsson, University of Borås, 2024

FROM LINEAR TO CIRCULAR DESIGN

One of the key challenges to making the clothing industry more sustainable is to move away from the traditional linear production towards a circular approach.

Designers must reassess their understanding of materials and the products before, during and after use.

In the circular economy, products and materials remain in circulation through processes like maintenance, reuse, remanufacture and recycling.

Source: Ellen McArthur Foundation

Infographic developed by Holm Kommunikation based on webinar presentation

Jonas Larsson presented different examples of using digital tools to support these principles.

Circulate:

In one project, a company offered free print upgrades to old garments to keep products in use. They used an in-store printing machine to produce the design that customers had created on a 3D customizer. Another project developed an autonomous delivery robot to enhance the sharing economy. The aim was to eliminate the logistics barrier to sharing while achieving 99.8% lower carbon emissions compared to a traditional distribution car. A third project activated people's wardrobe using RFID-tags. These can communicate with phones and notify the user if a garment has not been worn for a long time. The software can even offer to sell that garment automatically and arrange pickup for a new buyer.

Eliminate:

The first project introduced virtual fitting rooms for customers to use with a digital avatar. This meant clothing could be customized to fit the specific customer's needs, e.g. sleeve length, for a slight increase in price. Another project targeted the challenge of custom coloring using a digital printing machine that could dye yarn immediately before it entered the knitting machine. The project achieved 97% less water usage, 98% less process chemicals and lower energy use. All in a system that is flexible and can produce close to market. A third project tried to train an AI to do automated sewing but found that virtual simulation of materials needed to get better to achieve this.

Traceability is also needed to locate and eliminate waste. In addition, one project looked at documenting the journey of garments from fiber to customer using an app. This information was

logged on a blockchain and social aspects like wages were verified from three parties to ensure trust. Another project created a portable sensor to harvest data from production machinery or measure indoor air quality in production facilities.

Regenerate:

The final goal was to create a system that has no waste, inspired by the lifecycle of the Japanese cherry blossom. One niche project demonstrated biospheric design – using substances from the earth's surface that could be safely returned and simultaneously ensure human prosperity. This became a vest made from nettle-fiber yarn sourced from communities in the Nepalese mountains.

Take-aways from "Blockchain – traceability, transparency and circular innovation"

Presentation by Heidi Svane Pedersen

According to Heidi Svane Pedersen, we are currently moving from Economy of Scale to Economy of Scope – focusing on individualization, digital value chains and elimination of waste. One of the technologies that will scale this economy is blockchain.

Think of blockchain as a toy train with little magnets that connect the different carriages. One carriage has information on where the cotton comes from; another has information about the production and a third has information on where it is going to be sold. The blockchain is the magnets between the carriages; it helps us to trace all this information. This provides traceability, transparency and trust in a supply chain with many actors, low trust or many unknowns – a decentralized registry that is tamper proof.

The Nordic Blockchain alliance has worked with four business cases that come along with blockchain:



INCREASED TRACEABILITY

With enhanced traceability, companies can promote transparency within the supply chain



ENHANCED AUTHENTICITY

Companies can strengthen brand identity with digital ownership and proof of authenticity



INCREASED CIRCULARITY

Through the utilisation of decentralised and open marketplaces, companies can actively contribute to strengthening the circular economy



PURSuing NEW REVENUE STREAMS

By fostering greater consumer engagement, companies can pursue new revenue streams

Source: Webinar presentation. Find slides and recordings on the [project website](#).

The first business case is Increased Traceability, with the example of TextileGenesis, which provides infrastructure for Bestseller and H&M to start collecting data every time a garment moves through their value chain.

The second business case is Authenticity, illustrated by Spoor, which is utilizing public data around animal welfare and the origin of animals in leatherware production.

The third business case is Circularity, with the example of Empower, which provides smart contracts and crypto currency to support waste pickers. This data is then used in a digital product passport by the company Vestre to document the use of recycled plastics in their furniture. Smart contracts can also ensure that designers and other parts of the value chains get paid when things are resold throughout the lifespan of the product.

The final business case is New Revenue Streams, illustrated by Rotate, who launched a collection of summer clothes both in the real world and on the Korean metaverse platform Ifland, where consumers would buy a digital version of the clothes and link it to the physical object.

Heidi Svane Pedersen emphasizes that a Nordic blockchain would hold great business potential. The Nordics are a trusted brand out in the world and could be backed by our own blockchain. If Nordic brands were to use a European blockchain, the transparency standards might simply be too low to hold a competitive edge in this field.

Take-aways from "3D design strategies"

Presentation by Jon-Amund Søfferud

Manufacture Oslo is working on bridging the competence gaps that exist in the fashion and textile industry. This is well under way because Norway has provided funding to raise the competencies of businesses focusing on sustainability and technology.

Jon-Amund Søfferud explains the benefits of 3D technology in the fashion industry by showcasing the difference between 3D illustrations and 2D, which is the current state for many businesses. 3D is a communication aid that helps link the value chain more seamlessly and helps companies make better choices on sourcing and materials. Prototyping leads to many wasted resources because 37–45% of designs never end up in stores. Creating digital product twins can prevent this.

Working with 3D can solve issues with efficiency, consistency, sustainability, speed, competitive edge, innovation and supply chain optimization. It reduces carbon emissions by 96% compared to ordering a physical prototype from abroad and gives designers a better understanding of the garments, enabling them to make better products.

Transitioning to 3D is a difficult process for a company, taking 3–5 years. Each brand strategy is going to be unique but boils down to staff training and a good proof of concept. This has the potential to bring huge time savings – with one example reducing the development of a garment from 26 weeks to 10, including a 75% reduction in the need for physical prototypes.

Key areas to consider when implementing 3D design processes are condensed in the infographic below:

3D DESIGN

Designing with the help of 3D holds a number of advantages. It can help the designer to plan, source and produce clothes which fit the individual customer much better as well as reduce the use of energy and resources in the production phase.

Here are 8 key areas that designers should consider before they begin a 3D implementation process.

Fit blocks Develop the fit block and ensure you have the competencies to use them.	Core body profile Adapt and find the core body profile of the customers.
Supplier Onboarding Ensure suppliers are on board with your project.	Material Find the correct fabric and materials.
ROI Communicate return on investment to stakeholders and find the most reliable product segments.	Timeline Develop a realistic timeline.
Infrastructure Setup the right infrastructure.	People The bigger the company, the greater the challenge to adapt to new systems.

Source: Jon-Amund Søfferud, Manufacture Oslo, 2024

Infographic developed by Holm Kommunikation based on webinar presentation

4.2.5 Webinar about global perspectives

The webinar investigated the question: *How can we adapt the supply chain to support the transition towards a circular economy?* The webinar included three presentations: first, an overview of the global value chain; second, how Danish and Indian actors have worked to improve the supply chain; and finally, how farming and purchasing practices are being advanced in South Africa.

Webinar about global perspectives, August 14, 2024

Value chains in the global garment industry, by Peter Lund-Thomsen, Professor at Copenhagen Business School. Learn more here:

<https://research.cbs.dk/en/publications/sustainable-value-chains-in-the-global-garment-industry>

Green Textile Project, by Anandita Prakash, Head of Emerging Technologies at Innovation Centre Denmark, India. Learn more about the project here:

<https://ldcluster.com/portfolio-item/indo-danish-green-textiles-project/>

Empowering Stakeholders for Responsible Global Supply Chains, by Kaja Gresko, Senior Advisor at Ethical Trade Norway. Learn more about the project here:

<https://etiskhandel.no/artikel/10-shearing-sheds-in-south-africa-receive-certification-for-sustainable-cape-wool-standard/>

Take-aways from “Value chains in the global garment industry”

Presentation by Peter Lund-Thomsen

Peter Lund-Thomsen introduced the concept of global garment and textile value chains, presenting his views on the economic, social, and environmental implications of the placement of recycling hubs. He explained that modern value chains are global in nature because production capacity is primarily located in Asia, facilitated by the development of digital communication tools such as fax and email. Another contributing factor is the decrease in transportation prices over the last 30–40 years, as well as lower labor costs and more lenient environmental regulations in these regions.

Peter Lund-Thomsen explained that textile and garment production is “footloose”, meaning small wage increases could lead to the relocation of production. He cited China as an example, where wage increases in the last 10–15 years have led to production moving away to countries like Vietnam, Bangladesh, and Indonesia.

According to Peter Lund-Thomsen, it is financially unviable to establish large-scale garment and textile production in the Nordics due to high labor costs, strict environmental regulations, and the loss of production knowledge due to outsourcing.

Peter Lund-Thomsen argued for the utilization of well-established recycling chains in Asia instead of establishing new ones in the Nordics. Countries like Pakistan and India are seen as world leaders in mechanical recycling. However, chemical recycling in these countries is associated with increased environmental pollution due to insufficient facilities for water treatment.

The social aspects also need to be considered, as recycling provides employment for many women who earn their living in the informal sector. However, there is a need for improvements in labor and social conditions, including updates to machinery to avoid workers being exposed to fiber dust.

Peter Lund-Thomsen's final argument is that the Nordics should focus on supporting the development of new technologies to be implemented in Asia to create large-scale change in the industry. The Nordics should also support economic, social, and environmental upgrading of Micro, Small & Medium Enterprises (MSMEs), while limiting overall consumption in the Nordics.

Take-aways from "Green Textile Project"

Presentation by Anandita Prakash

The Green Textile project was conducted through a partnership between Innovation Centre Denmark in Bangalore, Danish Industry, and Lifestyle & Design Cluster. It aimed to improve the supply chain through production and sourcing, including trying to implement Nordic technology in India. Anandita Prakesh explained that smaller brands with a strong sustainability focus often struggle to find suppliers willing to accommodate their order quantities, leading to limited bargaining power. The project aimed to address this issue by assisting these brands in collaborative sourcing but saw limited interest in this approach. The project, however, successfully highlighted some of the challenges producers face in transitioning to more sustainable practices. These include:

- A diverse set of expectations from brands when it comes to defining sustainability and circular practices, making it necessary to align with each company's specific requirements.
- Understanding and complying with EU-regulation, which can be costly and time-consuming. Producers feel that regulations are designed without a full understanding of realities on the ground.
- Insufficient wastewater treatment. A strong market focus on prices makes it hard to tackle, despite a strong political will for regulation.
- Logistical issues, as recycling hubs in India are spread far apart.
- Literacy issues among recycling workers make sorting difficult, compromising the quality of recycled products.
- Lack of digitalization at the plants results in low traceability for the brands.

Anandita Prakesh concluded that the green textile project identified a significant disconnect between brand ambitions and minimum order quantities. She also highlighted that labor practices and digitalization are areas that require further attention to enhance sustainability efforts in the textile industry. Lastly, she emphasized the importance of brands developing exit strategies if they choose to leave a production location, as such a decision significantly impacts many people's livelihoods. This underlines the need for a holistic approach to sustainability, taking into account both environmental and social consequences.

Take-aways from “Empowering Stakeholders for Responsible Global Supply Chains”

Presentation by Kaja Gresko

The “Eastern Cape Upliftment, Empowerment and Sustainability” project takes place in South Africa, aimed at strengthening sustainable production, decent work, and climate change resilience in the wool and mohair industries. The project was initiated based on a due diligence study from 2020, revealing various issues including:

- Severe impacts of climate change on farmers' livelihoods.
- Frustrations with differing requirements of various sustainability standards.
- Difficulties faced by communal farmers in securing investments and land rights.

The project works with the National Wool Growers Association (NWGA) to support and represent communal farmers, including the institutional development of local representative structures. It has provided farmers with training and tools, such as advisors and virtual vet services. It has also managed to facilitate certification for 10 shearing shed associations, which received “Certificates of Compliance” with the Sustainable Cape Wool Standard. This certification ensures a price premium for farmers, while also satisfying the demands from brands, who are increasingly using certification as a tool in their due diligence efforts. However, many international standards are not viable options for these rural farmers.

The project also facilitates capacity-building courses for workers in processing and brokerage firms, resulting in a strengthened acknowledgment of new international requirements and the need for more ethical and sustainable practices in meeting market expectations. Likewise, members of Ethical Trade Norway, who source wool internationally, have engaged in dialogue forums with South African producers. These discussions allow farmers to directly interact with the buyers of their wool, providing the brands with first-hand insights into the complexities and challenges in the raw material stage of their supply chains.

Kaja Gresko concluded by stressing the challenges that farmers face from brand demands and emphasized the importance of a holistic approach to circular transition, ensuring a just transition for vulnerable and marginalized groups in the global supply chain.

Key lessons from Anandita Prakash and Kaja Gresko's presentations are condensed in the infographic below:

COLLABORATE WITH PRODUCERS

Varying sustainability requirements from brands make circular transition challenging for producers in the global supply chain.

Brands should consider:

- **Talk to producers:** Engage in direct dialogue with raw material producers to gain insights into the complexities and challenges of their production.
- **Think holistic:** Take a holistic approach to circular transition by including social aspects in producer requirements to insure a just transition for workers.
- **Plan your exit:** Develop an exit strategy if you need to leave a producer or location as it affects livelihoods.

Source: Anandita Prakash, Innovation Centre Denmark, India and Kaja Gresko, Ethical Trade Norway, 2024



Infographic developed by Holm Kommunikation based on webinar presentation

4.3 Sub-conclusions

Sharing Nordic Circular Competences facilitated the exchange of knowledge and solutions for the circular transition of fashion and textiles with a focus on the nexus between design and textile waste.

The initiative started out by looking into **wasted textiles** and found that large amounts of textiles were disposed of because of minor damage like pilling and holes. However, equal amounts were wasted because of non-physical aspects of the garments, such as poor fit or the perception that the aesthetics were out-of-fashion. This highlighted that brands cannot focus solely on improved functional durability but need to include aspects such as aesthetics and fashion in their understanding of quality. This further underlines the need for designers and those who handle waste to work closely together, learn from each other, and modify current design principles. It was also evident that correct sorting was a challenge for citizens but that this can improve over time if those handling waste invest in simple and consistent communication. They must also work together across the Nordics to fill gaps in sorting infrastructure and utilize each other's competences in areas where knowledge is no longer widely available.

Next, the initiative delved into various experiences with producing and using **recycled fibers** in the Nordic countries. In all four participating countries, recycling methods are constantly tested and refined. Presenters highlighted that each recycling method has its benefits and disadvantages, but that current technology can produce fibers of acceptable quality to make new textiles. However, markets currently see low demand for recycled fibers from post-consumer textiles because of factors such as cost, uneven colors and variable quality. This prompts a need for quality improvements and better information to the producers on the properties of these fibers. Participants pointed to the need for testing recycled fibers as if they were a new type of fiber and for creating new design strategies to match their properties. For instance, this could involve material-driven design that focuses on designing for circularity. Finally, the actors from across the waste industry agreed that recycling is not going to solve environmental and climate related issues, but that consumption must be addressed in order to help solve them.

Our webinars also revealed that there are many ways to reduce the environmental impacts of textile **processing and production**. This involves using the right mix of recycled and virgin fibers to ensure the best possible quality and spinning yarn differently to create a natural stretch. It could also involve disrupting the traditional offshore production by utilizing local micro-factories to produce on demand. Similarly, biobased dyes are available for coloring all types of fibers and can avoid the need for harmful chemicals. Further technological advancements are needed but, most importantly, there is a need for brands to become aware of the existence of more sustainable alternatives to current practices and start utilizing them.

The initiative also addressed the need to evolve **digitalization and traceability** in the Nordics: Presenters discussed the potential for using Blockchain technology as a driver of new business opportunities, because it ensures transparency and authenticity of not just the product but the whole value chain. Finally, 3D processes have the potential to cut resource use and carbon emissions dramatically in the design phase of a garment by reducing the need for physical prototypes. However, the transition is difficult for companies and takes 3-5 years to complete. To sum up, many digital tools already exist to support circular business models and overcome many of the barriers that customers or brands face, but companies need to be aware of these tools and need help to implement them.

While the initiative focused on sharing Nordic circular competences, the project could not overlook the need to also discuss **global perspectives** as most production takes place far from the Nordics. Participants gained an understanding of why supply chains are global today, and explored the economic, social, and environmental implications of placing textile recycling in the Nordics versus in Asia. Participants also gained insight into the challenges faced by producers in Bangladesh, who struggle to comply with EU-regulation and a diverse set of sustainability expectations from brands. This experience was echoed by wool and mohair farmers in South Africa, highlighting the need to include social aspects in the efforts to transition the global supply chain.

Sharing Nordic Circular Competences managed to provide access to the newest research and practices and bring together frontrunners from the four Nordic countries. Participants gained good insight into the barriers and solutions that exist to making textile design, production, consumption and waste handling more circular. What remains is a need for continued knowledge sharing on these topics and for the Nordic actors to implement the suggested solutions (see breakdown of actions in [Chapter 6](#)).

CHAPTER 5: EU AND TEXTILE COFFEE BREAKS

This chapter summarizes the series of webinars titled *EU & Textile Coffee Breaks* hosted by the Danish Ministry of Environment for participants in The Nordic Textile Collaboration.

5.1 About the initiative

The purpose of this webinar series was to introduce participants to various aspects of the EU regulatory framework they would be working under in the coming years and link these insights to activities in Active Textile Society and Sharing Nordic Circular Competences. Each *Coffee Break* consisted of a presentation by a civil service official, introducing an initiative related to the EU Strategy for Sustainable and Circular Textiles that they were currently working on. The webinars gave participants the chance to connect with expert officials who could provide insight into current EU proposals for new legislation/initiatives and ongoing negotiations, which may otherwise be complex and challenging to grasp. The webinars also served as an open forum for questions that could be answered directly by the relevant presenter/expert.

Five *EU & Textile Coffee Breaks* were organized between October 2023 – August 2024. Each webinar consisted of 15–20-minute presentations and 10–15 minutes of Q&A. Presenters/experts were identified by the Department of the Danish Ministry of Environment, and each webinar was moderated by an official from the Ministry's office for Circular Economy.

Presenters

[Waste Framework Directive](#), by Mathias Bach Kirkegaard, the Danish Ministry of Environment.

[Ecodesign for Sustainable Products Regulation](#), by Mathias Bach Kirkegaard, the Danish Ministry of Environment

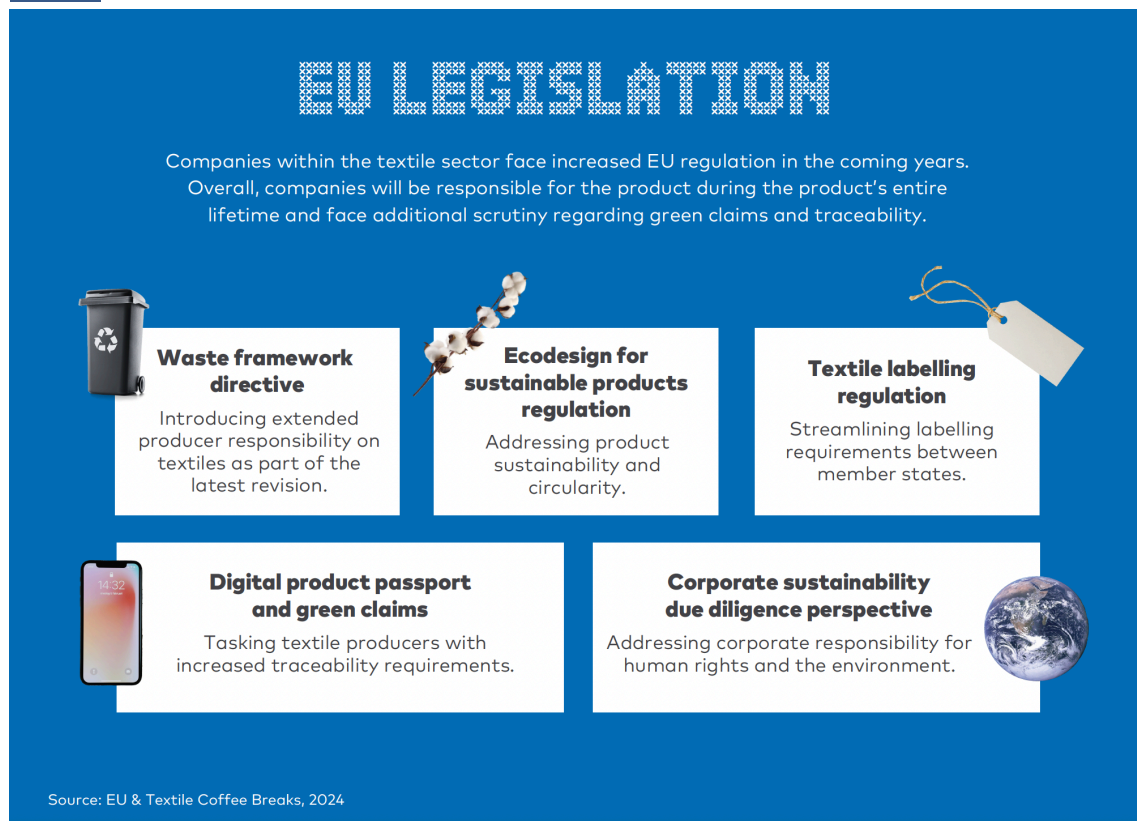
[Textile Labelling Regulation](#), by Mille Ertløv Hansen, the Danish Safety Technology Authority

[Digital Product Passport](#), by Anders Bomholdt, Danish Business Authority and *Green Claims* by Karen Dalgaard Sanning, the Danish Ministry of Environment

[Due Diligence](#) by Shirin Ørberg, the Danish Business Authority

5.2 Key take-aways from the webinars

Below is a short summary of each webinar held in the EU & Textile Coffee Breaks series. The summaries are descriptions of insights presented at the time of the webinar, and do not reflect any further developments that may have ensued relating to the EU initiatives described. Slides from each webinar have been made available on the [Danish Environmental Protection Agency's website](#).



Infographic developed by Holm Kommunikation based on webinar presentations

5.2.1 Waste Framework Directive

Presentation by Mathias Bach Kirkegaard

Date: October 23, 2023

This session focused on the newly proposed revision of the EU's Waste Framework Directive. It began with a general presentation of the directive and the relation to the European Green Deal and Circular Economy Action Plan, before zooming in on the proposed extended producer responsibility (EPR) for textiles as part of the directive's revision. The presenter was selected because of his involvement in official EU negotiations and role in supporting to shape the Danish position on the directive. Participants were informed of the most recent developments in negotiations, including proposals on costs of EPR, national producer registers, the role of producer responsibility organizations and requirements to waste handling.

5.2.2 Ecodesign for Sustainable Products Regulation

Presentation by Mathias Bach Kirkegaard

Date: January 16, 2024

This session focused on the Ecodesign for Sustainable Products Regulation. The presenter was selected because of their involvement in EU negotiations and was able to provide a deep-dive into the final political agreement around the initiative and how it was expected to have an impact on products in the coming years. A mapping was presented of the way Ecodesign Regulation features in various EU legislation, including the Waste Framework Directive, Right-2-Repair Directive, End-of-Life Vehicles Regulation, Construction Products Regulation, Critical Raw Materials Act, Packaging and Packaging Waste Regulation and Battery and Waste Batteries Regulation. A specific case study on Ecodesign on jeans was presented to highlight what performance and information requirements might be expected in the textile industry. Other aspects of the regulation, which could impact the textile industry, were discussed, including digital product passes, banning the destruction of textiles and footwear, and public procurement requirements. Among the key take-aways was that preparatory work for Ecodesign requirements had already begun and was seen as a priority area for Ecodesign regulation.

5.2.3 Textile Labelling Regulation

Presentation by Mille Ertløv Hansen

Date: April 5, 2024

This session focused on the EU's current Textile Labelling Regulation and upcoming revision as part of the EU Strategy for Sustainable and Circular Textiles. The presenter was a representative from the Danish Safety Technology Authority, who had taken part in providing Danish input to the EU Commission's public consultation on the revision. The session began with a summary of the current Textile Labelling Regulation followed by an introduction to the Commission's initiative to revise the current regulation. The objectives of the initiative were presented as addressing shortcomings in the current rules as well as divergent labelling requirements between Member States. Additional labelling domains were also explored. Finally, participants were made aware of the public consultation by the Commission until April 15, 2024, which would inform the evaluation of the Regulation and the impact assessment on its possible revision (first quarter 2025).

5.2.4 Digital Product Passport and Green Claims

Presentation by Anders Bomholdt and Karen Dalgaard Sanning

Date: June 7, 2024

This session provided participants with updates on two central EU initiatives: The Digital Product Passport by The Danish Business Authority and Green Claims by the Danish Ministry of Environment. The speakers were selected due to their role in EU negotiations. The presentation on Digital Product Passports began with an introduction to the Ecodesign directive and regulation, and how the Digital Product Passport ties in. Examples of product performance and information requirements were described, including for durability, reliability, reusability, upgradability, repairability and more. It was explained that delegated acts for performance requirements, information and green public procurement will specify exactly which performance

and information requirements will be included. Some main design features of the Digital Product Passport were presented, such as a decentralized approach to data storage, access through a product unique identifier, and access on a need-to-know basis. The presenter ran through a checklist of what companies will need to do to live up to Digital Product Passport regulations, and what a Digital Product Passport might look like. Finally, EU implementation work ahead was described, including aspects such as Digital Product Passport service providers, digital credentials, a Digital Product Passport registry and web portal, as well as the definition of standards by December 31, 2025.

The presentation of the Green Claims Directive began with a description of the scope of the proposal in the ongoing negotiations. This included business-to-consumer commercial practices, where environmental claims and labelling are voluntary and claims are related to environmental aspects, impacts and performance. The proposal also denotes that substantiation and communication of claims shall be reviewed and updated at least every five years.

The presenters then described how to substantiate claims, how to handle comparative claims, as well as how to communicate environmental claims according to the EU Commission's proposal. The links between environmental labels and labelling schemes to the new directive were highlighted, such as the requirement to live up to the new directive, and a proposal from the Commission to prohibit the establishment of new national or regional publicly owed schemes.

Finally, proposed enforcement of the provisions for Member States was laid out, including what factors to consider when designing the appropriate penalty for infringement. The presentation ended with a description of the forthcoming process, including a council meeting on June 17, 2024, followed by Trilogue meetings, an agreement, publication, and implementation in each Member State.

5.2.5 Due diligence

Presentation by Shirin Ørberg

Date: August 9. 2024

This session focused on the newly adopted EU Corporate Sustainability Due Diligence Directive (CSDDD), and how it reshapes corporate responsibility for human rights and the environment across the supply chain. The speaker was selected due to their role as the Danish national expert on CSDDD. A timeline of the EU process, including the deadline for national implementation in 2026, and phasing in of rules from 2027–2029, was shared. An overview was provided of the directive's key components, including further details on the definition of very large companies, due diligence, addressing adverse impacts and companies' chains of activities. Moreover, the requirements for companies to adopt climate plans were described. Key take-aways included CSDDD being game-changing legislation on responsible business, the close connection to CSRD (sustainability reporting) and that, even though only large companies are within scope, SMEs will be affected indirectly through the supply chain.

5.3 Sub-conclusion

The *EU Textile Coffee Breaks* provided participants from the corporate sector, business associations, waste management and academia with complementary knowledge to the ongoing activities in Active Textile Society and Sharing Nordic Circular Competencies by describing the EU regulatory environment for actors who play a part in the textile industry. Between 20–60 participants joined each session. Many participants had reported challenges in getting an overview of EU developments on textile-related topics, which this webinar series aimed to solve. Participants responded positively to these short informal updates, where connections were made to various experts, and participants were able to have their questions answered directly, summarizing complex information and negotiations in a compact, accessible way.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

In The Nordic Textile Collaboration, the aim was to identify and promote solutions for reducing unnecessary consumption, extending the lifespan of textiles, promoting circular business models, strengthening digitalization and traceability in the fashion and textile industry and supporting increased and improved collection, sorting, reuse, and recycling of textiles.

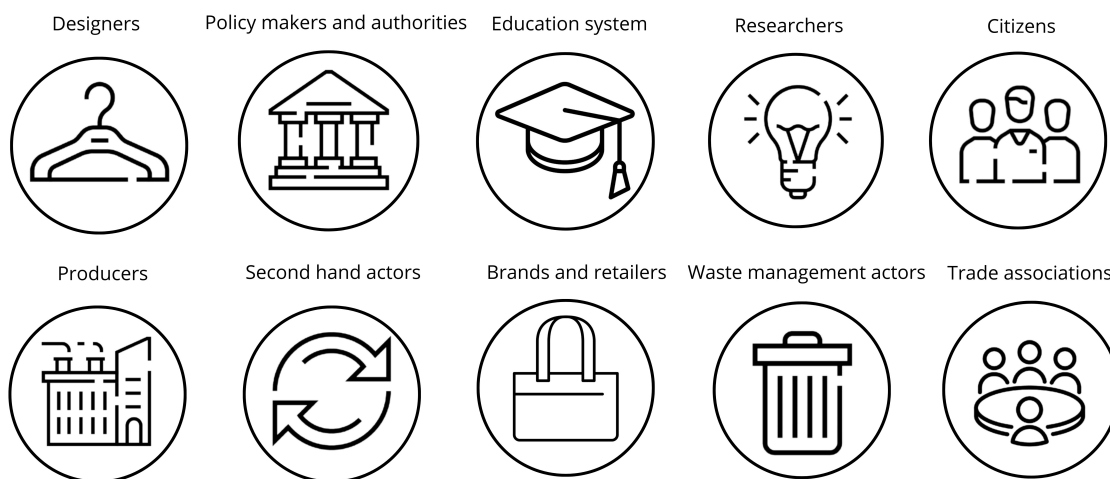
For this purpose, a new Nordic community for knowledge exchange was established across the value chain for textiles and across the four participating countries: Denmark, Finland, Norway and Sweden. A community that brought together companies, citizens, organizations, and research institutions allowing participants to learn from and inspire each other. This community discussed central topics and collaborated on identifying solutions from a holistic perspective, thus reaching mutual understanding across both national and disciplinary borders. During workshops, project participants generated a list of actions that they believed could push the development of a circular textile economy.

This chapter presents the list of actions grouped into three overall recommendations from participants in The Nordic Textile Collaboration:

1. Support the growth of circular business models
2. Engage citizens in the circular transition
3. Make design for circularity the standard

The following section goes through each of the three recommendations, presenting the list of actions as well as the roles that different stakeholders could play in order to make these actions happen in reality.

Central actors are highlighted in the action catalogues with the following icons:



All recommendations represent the views and ideas of project participants; that is, presenters, participating citizens, companies, organizations and researchers. The recommendations are to be seen as a wish list based on the experiences and best practices of project participants. The recommendations primarily concern action supporting the uptake of a circular value chain for textiles. As emphasized by several participants during the project (see [Chapter 3, Section 3.2](#), and [Chapter 4, Section 4.2](#)), the environmental impact of textiles will only decrease if the transition implies a reduction in production and consumption rates. Thus, the list of actions proposed here is not complete, and, according to project participants, it will take many more interventions and efforts to lower the environmental impact of textiles and fashion. Still, the following list of actions proposed by participants in The Nordic Textile Collaboration underline that several opportunities for moving in that direction do exist and could be realized.

6.1 Support the growth of circular business models

Circular business models can extend the lifespan of textile products by enabling more use per user, more users per product or users to go beyond physical products. While these are essential properties of circular business models, environmental gains might not be readily apparent. In the project, it was stressed during webinars that circular business models only achieve environmental gains if they contribute to the following goals: avoidance of new production, extension of product life, improved use-phase and reduced waste generation (see [Chapter 3, Section 3.2.1](#)).

While these principles for circular business models seem to be widely accepted across the Nordics, the project revealed huge barriers for turning these principles into practice. Participating companies pointed out that, at the moment, circular business models cannot compete with conventional business models when it comes to prices, time of delivery, availability and attractiveness. Participating citizens highlighted that there is a need for developing several sub-types of each circular business model to ensure that services and products fit citizen needs. These include remote services for repairs, easy return models for secondhand items, rental services for different situations (including pregnancy, workwear and festive) and training in do-it-yourself solutions. Accordingly, this opens up lots of unexplored avenues for companies who can earn money from providing new types of services and support functions as an alternative to earning money by producing new textiles.

Thus, according to participants in The Nordic Textile Collaboration, a wide set of actions needs to be undertaken for circular business models to flourish, and everyone has to do their part. The following catalogue of actions covers key recommendations from project participants about how to support the growth of circular business models in Nordic societies.

Support the growth of circular business models

Make circular business models competitive

Establish VAT exemptions or other types of subsidies on repairs, redesigns, secondhand products and rentals, enabling these services to compete with the prices of new products.

According to project participants, this would be a task for policymakers, who could draw on experiences from those countries having successful experience with designing and implementing such interventions. 

Make circular business models available and convenient

Develop online directories and digital maps showing the landscape of product services, with addresses, opening hours and prices (bearing in mind the reparability scale).

According to project participants, this task involves collaboration across the value chain. Product service providers (or the trade associations representing them) should provide input and citizens should be involved in testing it.   

Establish circular solutions inside or close to stores selling new clothes to ensure that repair, redesign, secondhand products and rentals become natural elements of every shopping mall or street.

According to project participants, this could be a joint effort of city councils and those who rent out space for shops to establish the necessary requirements and conditions. 

Implement easy return models, such as take-back solutions, in secondhand shops and pick-up services for clothes in need of product care or repair, as well as rented outfits.

According to project participants, this is a task for companies that should build on best practices shared, for instance, through participation in sectoral collaborations facilitated by trade associations.  

Expand opening hours through after-hours self-service opening in secondhand shops.

According to project participants, this solution requires the willingness of companies and secondhand retailers to apply flexible frameworks for their service and, eventually, for their employees. 

Shorten delivery times on services and products

According to participants, this would be a joint effort of companies and developers of smart technologies. Higher education institutions can also play a role in training employees to use new technologies, such as 3D design.  

Make circular business models attractive

Upgrade marketing skills of the providers of circular business models to get a broader outreach. For instance, resellers need to know how to display secondhand products in user-friendly and appealing ways and rental services can be promoted as a service for various types of occasional wear.

According to project participants, higher schools of education and trade associations could collaborate on providing training sessions to providers of circular business models.  

Arrange guided tours to promote circular business models as an attractive and natural part of society and as something to be proud of.

According to project participants, this activity could be developed through collaboration between municipal offices and tourist agencies and facilitated by trade associations.  

6.2 Engage citizens in the circular transition

Overconsumption or “unnecessary consumption” often appears on the list of factors that contribute to the high environmental impact of the fashion and textile industry (see [Chapter 1](#)).

Still, this nut seems hard to crack. Several communication campaigns have tried to reach citizens, hoping to change consumer behavior towards an approach that puts less pressure on the planet, but so far with little success, as consumption rates continue to grow year after year.

Thus, communication campaigns are not enough and, inspired by other small-scale projects in the Nordics, The Nordic Textile Collaboration invited citizens to take active part in finding ways to combat overconsumption. In concrete terms, the project wanted to stress the role that citizens can play in a circular textile economy. Through the six-month challenge where participating citizens refrained from buying any new textile products for half a year, their experiences and views were gathered on the circular solutions that they could personally implement to prolong the lifespan of clothes and other textiles already produced, thus reducing the need for new products.

Getting insights from this dedicated group of Nordic citizens, the project revealed a unique overview of barriers hindering citizens from contributing to the development of a circular textile economy. Key barriers included lack of time, motivation, skills, equipment, materials, and overview. These insights led participants to identify a list of solutions. On this basis, the following catalogue presents recommendations for actions that, according to project participants, would support Nordic citizens in playing a more active role in a future circular textile economy.

Action catalogue

Engage citizens in the circular transition

Motivate through incentives and training

Communicate that everyone can do simple repairs using basic tools at home (e.g., scissors, candles and pliers for fixing zippers, as well as needle and thread for fixing holes).

According to project participants, this is a task for many actors, including the school system and manufacturers, who could promote this idea when selling textile products; textile designers and producers, who need to enable care practices from the very beginning through choice of materials, labelling and instructions; and national authorities, who can support communication through campaigns and educational materials.    

Include product care, repair and redesign in educational systems to provide citizens with basic skills for maintaining textile products to keep them in use for longer.

According to project participants, policy-makers can push for handicrafts to be given high priority in relevant subjects in primary schools, while local design schools can take part in developing educational materials.  

Offer training sessions on the topics of product care, repair, redesign and styling (including sizing), stressing and showcasing how to use your existing wardrobe and what one can do at home without professional help

According to project participants, several actors can play a role: Policy-makers can support the opening of more repair cafés; brands can invite customers to workshops with tailors and stylists; and design schools can offer after-hour courses.   

Advertise the warranty on clothes to make it an active part of citizens' repertoire.

According to project participants, this is a task for companies that should build on best practices shared, for instance, through participation in sectoral collaborations facilitated by trade associations.  

Make tutorials, equipment and materials widely available

Promote do-it-yourself (DIY) tips on social media and in the public sphere ensuring easy access to books and tutorials about product care, repairs, redesigns and styling.

According to project participants, different stakeholders can take on this promotion, such as designers, teachers, and influencers, while the efforts could be supported by authorities.   

Organize easy access to equipment and materials for DIY solutions by, for instance, including free areas in secondhand stores with fabric (worn-out clothes), yarn, and DIY instructions, and offering public sewing machines at libraries and in repair cafés.

According to project participants, this constitutes a task for many actors, including public libraries, repair cafés, and secondhand shops. Also, manufacturers of textiles could make it part of their business model to offer citizens instructions and tools to do product care, repairs and redesigns themselves at home or in-store. Likewise, collectors and sorters of textile waste could make it part of their service to pass on materials for DIY solutions found in the discarded fraction. 

6.3 Make design for circularity the standard

A recurring argument raised by project participants has been that the linear model for textile production stands in the way of achieving a circular textile economy. There is a need to move away from conventional methods and, instead, apply the three principles of design for circularity: 1) Design materials and products to be kept in use at their highest value for as long as possible; 2) Design to eliminate waste and pollution; and 3) Design to improve biodiversity, as well as air and water quality (see [Chapter 4](#)).

The application of these three principles requires a lot of effort from everyone in the global value chain and needs to build on insights from several disciplines. In the project, consumption research was proven to have a lot to offer designers. Project participants discussed how better understanding of the use-phase of textiles is crucial for improving design for circularity. Likewise, they highlighted that digitalization can help overcome several of the current barriers to circularity, including the traceability issue, where brands and suppliers struggle with tracking products from cradle to grave, preventing them from reselling products and making valid green claims.

Project participants shared knowledge about new production methods and materials that contribute to the reduction of waste and pollution. It was stressed that, although these methods and materials are ready and available, they are not widely used by the fashion and textile industry. This situation applies, for instance, to biocolours and recycled fibers. The market is already capable of producing biocolours and recycled fibers for most applications, but demand is lacking.

Finally, some presenters pointed to a diverse set of expectations from brands to explain why producers find this circular transition challenging; amongst other factors, they emphasized the necessity of incorporating social aspects into the circularity requirements imposed on producers (see [Chapter 4, Section 4.2.5](#)). This is crucial to ensure a fair transition for vulnerable groups within the supply chain.

Participants in The Nordic Textile Collaboration shared experiences and solutions to these issues. On this basis, the following catalogue gathers together a list of actions that, according to project participants, would make design for circularity the standard.

Action catalogue

Make design for circularity the standard

Learn from the use phase

Design textile products that can circulate in society for a long time. Based on what we know about the use phase, we need products that are easy to maintain and repair, easy to redesign in order to accommodate changing styles and needs, easy to resell and easy to recycle.

According to project participants, designers play a key role in developing products fit for circularity, but more actors could take part, including researchers with expertise in textile consumption, as well as governments, who can provide support by providing research and development funds, whereas trade associations can establish forums for knowledge exchange between designers and users. 

Utilize existing infrastructures

Take advantage of the already existing infrastructure for sorting and recycling before establishing new national solutions.

According to project participants, it is important to ensure coordination among public and private actors across countries when it comes to textile waste management, as there is more to win than to lose from collaborating.   

Digitalize the industry

Upgrade skills in 3D design to customize products and reduce the need for prototypes and stocks.

According to project participants, this is a task for educational and research institutions, who can offer training sessions together with trade organizations, and, potentially, supported by government funds.    

Invest in methods and tools for tracing products to support circularity, e.g., by making detailed product information available throughout the lifetime of products. Traceability is key for circularity as a lack of product information stands in the way of effective repairs, resales, rentals, etc.

According to project participants, designers and producers need to pair up with technology providers to achieve two main goals: 1) implement blockchain or other technologies to document environmental footprints; and 2) learn how to collect and analyze data. Project participants mentioned that trade associations can act as facilitators of these collaborations.   

Make products with recycled and alternative materials more attractive

Improve quality of products with recycled fibers by sharing knowledge regarding central issues, such as spinning techniques, and the right mix of recycled and virgin fibers.

According to project participants, producers of recycled fibers and designers can benefit from collaborating on improving the products in alliance with research institutions, potentially supported by public and private funds.    

Develop tests and certification of recycled fibers to increase demand. Currently, the demand for recycled fibers is low. Better information and uniform testing could make producers more comfortable utilizing recycled fibers.

According to project participants, this action can be supported by authorities, research institutions, textile recyclers and textile producers in collaboration.    

Teach designers how to design products with alternative materials and/or recycled fibers, e.g., utilizing material-driven design; asking which garments can be designed using circular materials rather than creating a design and needing to find a circular material to produce it.

According to project participants, this action requires cross-disciplinary collaboration between designers, research institutions and recyclers to create a common understanding of how to use "new" recycled or biobased materials.   

Promote a broad definition of quality to make products with recycled fibers more attractive for customers. Quality needs to be understood as a unity of functionality, aesthetics and fashion.

According to project participants, it is important that designers and manufacturers engage in improving the aesthetics and emotional durability of products with recycled fibers rather than solely focusing on improving functional durability.  

6.4 Final remarks

This report has presented key take-aways from The Nordic Textile Collaboration – a project carried out from 2022–2024 with participation from Nordic companies, citizens, organizations and research institutions. The aim of providing this comprehensive account of project activities and outcomes is to share experiences and establish an overview to build on for new initiatives. Instead of starting from scratch, it is hoped that future initiators will continue what has been started and consider the recommendations in this report when designing new projects and interventions.

As a final remark, it is important to highlight that common to all solutions listed in this report is that a) they have to bear environmental gains in mind; b) they imply development of new skills at all levels of society; and c) they require long-term commitment from everyone. In addition, it is important to stress that the proposed actions are interdependent. Circular business models will never grow without more people demanding and using them. Circular business models need to incorporate principles for circular design as alternatives to linear production methods to achieve environmental gains. Likewise, circular design principles will remain theoretical unless business models use them, and citizens demand textiles designed according to those principles. The overall aim of the transition needs to be to reduce the environmental impact of textiles and fashion. The uptake of a circular textile value chain contributes to achieving this but only if interventions and activities are designed for it.

Put briefly, there are roles and tasks for everyone on the agenda of a circular textile economy, and there is a strong need for continuous collaboration, locally, nationally, across the Nordics and globally to achieve progress and a more circular future.

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