

# CIRCULARITY TOOLKIT

Find out how you can improve your textile business from a circular perspective.

Circularity toolkit is a further development of Designers Toolkit by Science Park Borås done in the Project "*Framework for Circular Textiles - Classification of recycled textiles and criteria for circularity*" (Vinnova 2022-01355)

Big Thank you to all partners in the project who has contributed to this tool

Authors: Lena-Marie Vikingsdotter Jensen, Anett Aldman and Adrian Zethraeus

Copyright: Science Park Borås encourages the use, reproduction, and dissemination of the material in this document. The material may be copied, downloaded, and printed for private use, research, and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of Science Park Borås as the source and copyright holder is given and that Science Park Borås's endorsements of users' views, products, and services are not implied in any way. This document is managed and updated by Science Park Borås at the University of Borås.

@Science Park Borås at the University of Borås

The Classification tool which is linked to in this document is a property of RISE, Research Institute of Sweden.

Funded by Vinnova

Version: 1.0 2024

# ABOUT CIRCULARITY

Textiles and textile products are complex and consist of different materials and chemicals blended at different stages of manufacturing to fulfil purpose and aesthetic expression. The number of combinations is almost infinite. Depending on Material selection, material combination, technical parameters, assembling methods, available recycling processes and systems and behavior the options for cycling a product or a product category differs.

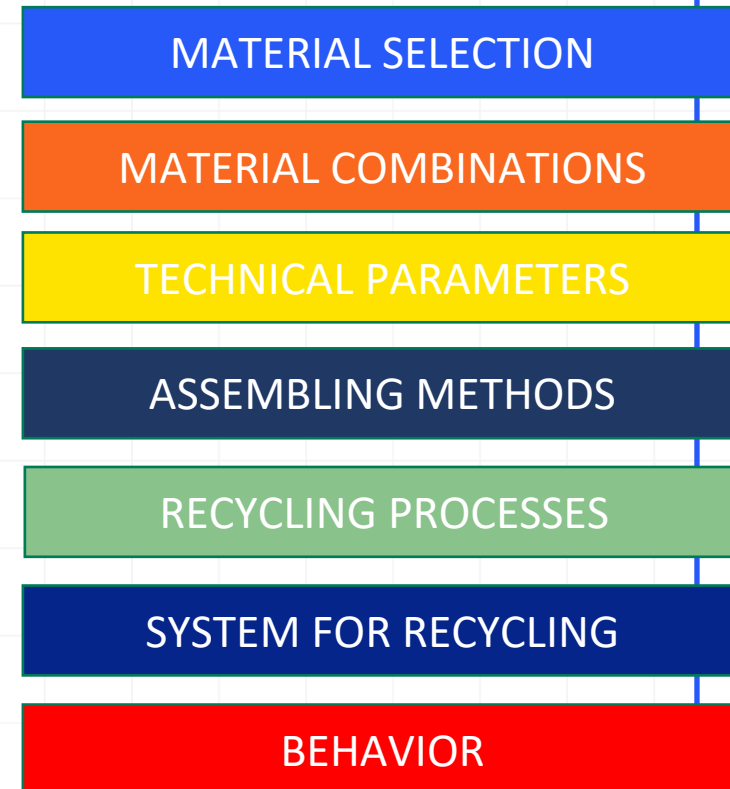
In society today, there are several definitions of what recyclability means. In this tool recyclability are defined as:

*The ability of a product to be diverted from the waste stream through available processes / systems and collected, processed and returned for use in the form of raw material or product.*

Ability to circulate

The difference between recyclability and ability to circulate is that the latter is a broader concept and also includes resource efficiency, long lifespan, redesign & remake. Ability to circulate could then be described as ability for a product to function in circular systems.

The ability for a textile to circulate is highly dependent on making the "right" choices at all stages of the value chain so that quality and value are retained for as long as possible.



# ABOUT CIRCULARITY TOOLKIT

Circularity toolkit is a tool for Actors in the textile value chain how wants guidance in assessing a textile product's or product category's ability to circulate and get inspired to make well-considered decisions about circularity already early in the development process.

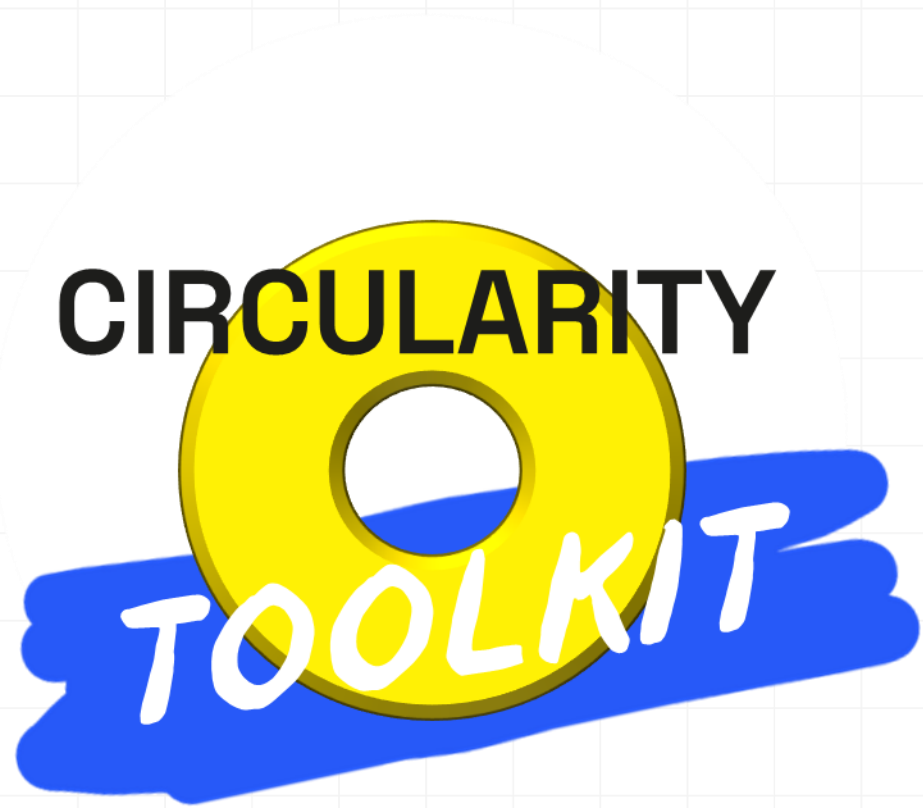
The tool contains 2 parts:

- 1 set of general questions about the company's values and the expectations of the product.
- 1 set of questions related to the ability to circulate, divided in 4 themes;
  - **Use of Resources**
  - **Lifespan**
  - **Redesign & Remake**
  - **Recycling**
- Each question is loaded with plausible actions which will increase the ability to function in a circular system. The actions are divided to 6 areas; Materials, Design, Business Model, Production, Communication and Innovation.
- By going through these questions and actions in the Toolkit, a priority list is created that can be used as a basis for the continued circular work.

# INSTRUCTIONS:

- Select one product or product category
- Go through the questions in the toolkit. For the first set of questions write your notes in the white boxes with blue line. In the second set answer YES or NO.
- If the answer is YES, just confirm and go to the next question.
- If the answer is NO go through the proposed actions and decide and mark which actions are relevant for your product category in focus.
- Some themes might be not applicable to raw material producers. If so just move on to next theme. (But it might be a good idea to read though to have a better understanding of your customers and partners in the value network).
- Analyze your actions and compare with the descriptions in part 1. What actions to prioritize? Are the actions in conflict to each other? In page 37-38 you can find a model for the action plan.
- If you need support, don't hesitate to contact Science Park Borås.

Email: [smarttextiles@hb.se](mailto:smarttextiles@hb.se)



# PART 1

General questions  
to set the frame

# SELECT PRODUCT CATEGORY

E.g. Jackets, Yarns, Non-wovens, Socks,  
Trousers etc.

Product category:

# IDENTITY

**Which are our overall sustainability strategies?**

**Answer:**



# IDENTITY

**Describe the core values  
of the company**

**Answer:**

# PRODUCT CATEGORY

**Describe the intended  
customer.**

**Answer:**

# PRODUCT CATEGORY

## Describe the purpose of product.

- What properties and details/trims are essential for the product's practical and aesthetical functions?
- How long-lasting is the product? E.g. How many uses or wash cycles is it expected to last?
- How sensitive is the product to current trends?
- Which materials are suitable? Think about what opportunities and limitations the materials pose from a circular perspective (environmental impact vs. lifespan vs. recyclability)
- Are there any limitations regarding availability e.g., quantity, scale or costs?
- What function does the product fulfill in the product range? Consider the number of variants and color schemes to avoid unnecessary products in the range.

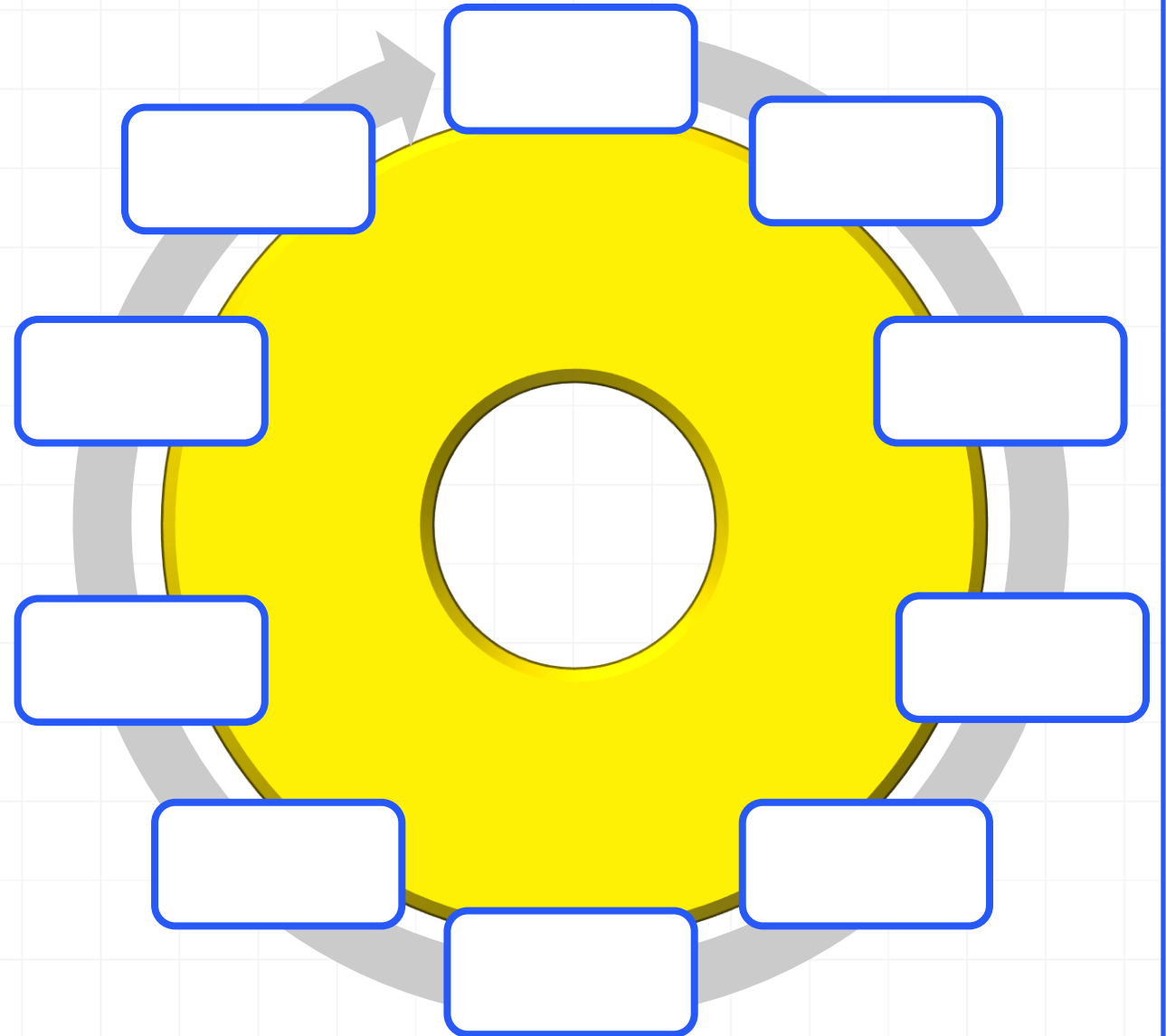
Answer:

# LIFE CYCLE

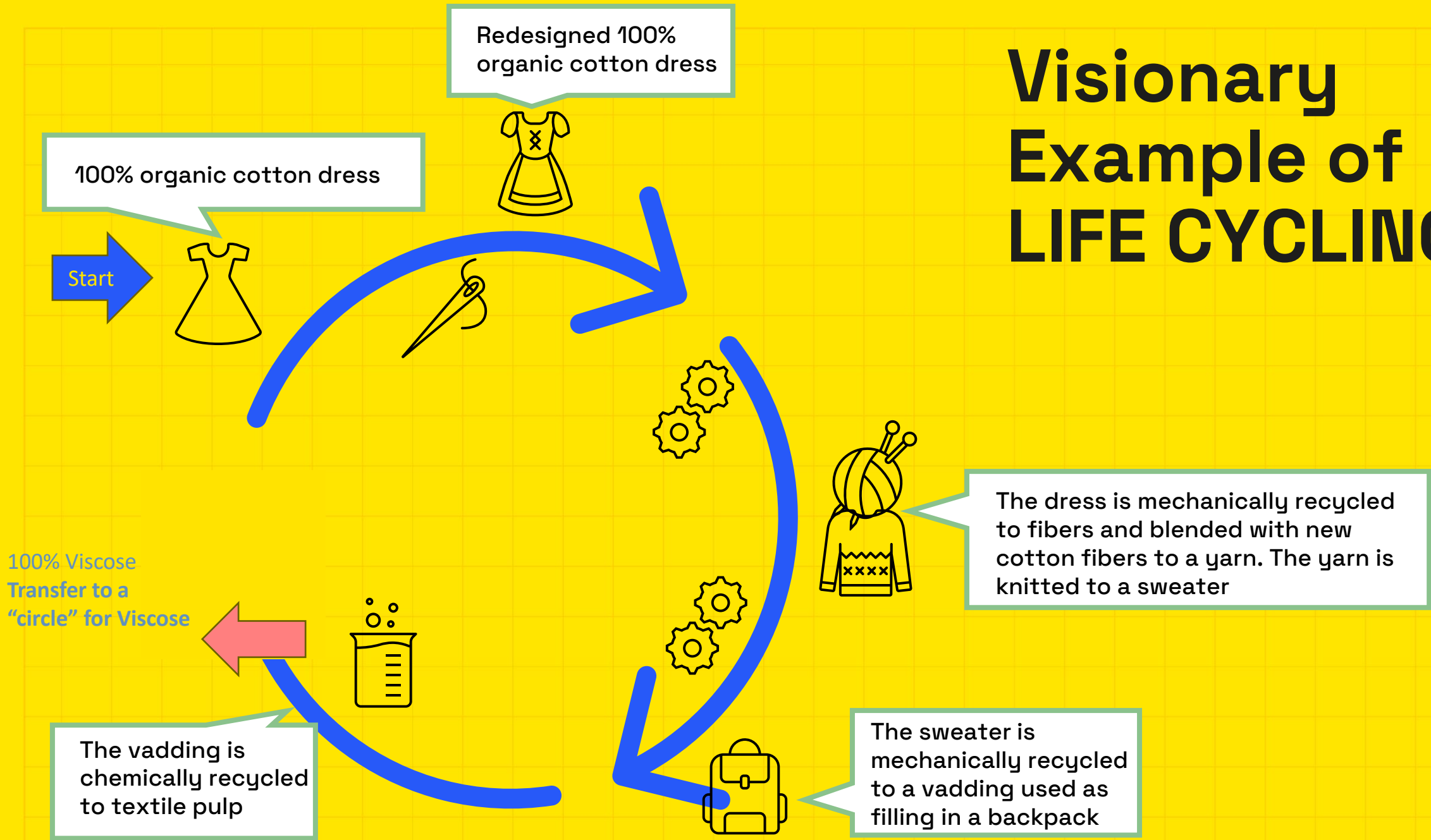
**Describe the intended life cycle of the product/ product category.**

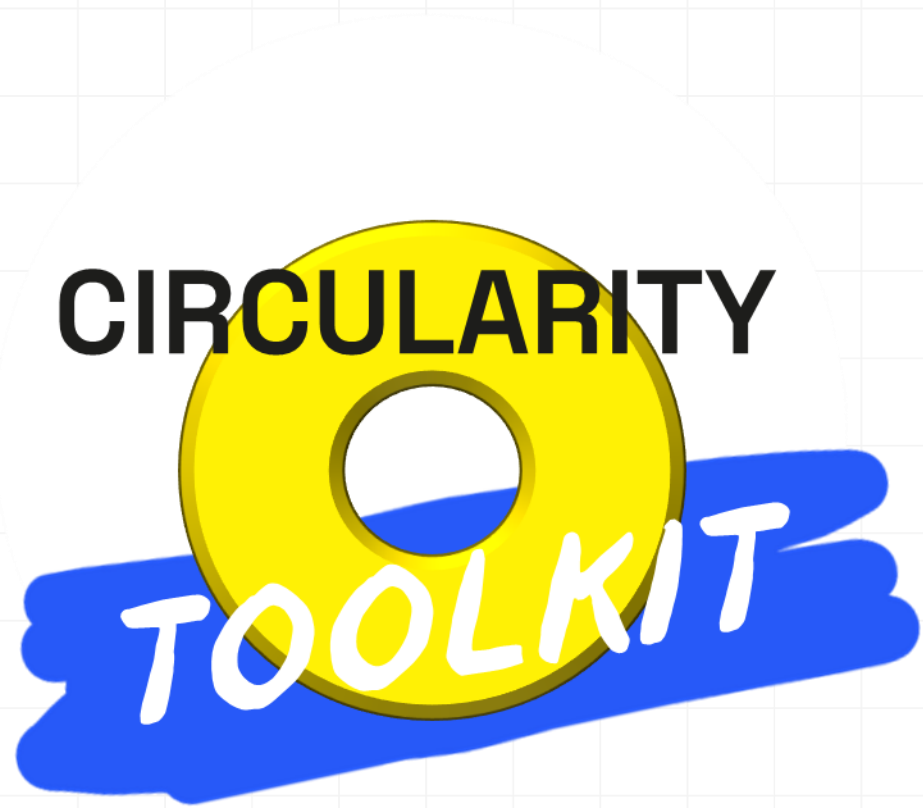
- Who is the first customer?
- How do you make sure that you fulfill the needs/ guide them to buy the right product?
- What happens during and after the initial user phase?
- What happens at the end of the product's life cycle?

Use as many boxes as needed or add more if necessary.



# Visionary Example of LIFE CYCLING





**CIRCULARITY**

**TOOLKIT**

## **PART 2**

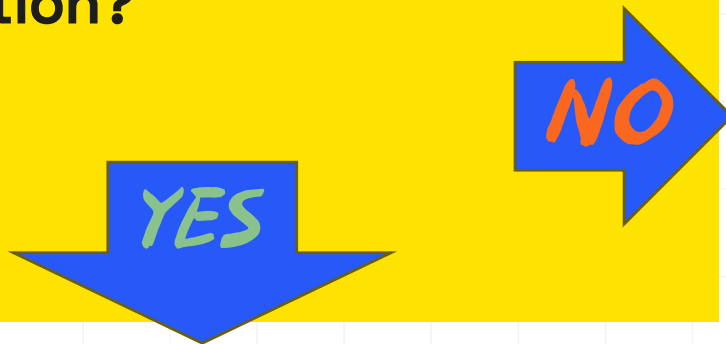
**Questions for assess  
ability to circulate**

# RESOURCE USAGE

# RESOURCE USAGE

1.

**Do we use raw materials with advantages for the environment and biodiversity compared to conventional materials, for example organic certification?**



Go to next page/slide

## Actions if the answer is NO:

**Action Materials:** Use raw materials with a lower environmental impact compared to a conventional material. Ex. certified and/or recycled raw material.

**Action Materials:** Consider the blend of materials so it fits into present material cycles when the product is used up. E.g. The product's recyclability can be investigated by using a classification tool for recycling of textiles such as RISE provides:

LINK to Framework for circular textiles:

<https://www.ri.se/en/what-we-do/projects/framework-for-circular-textiles>

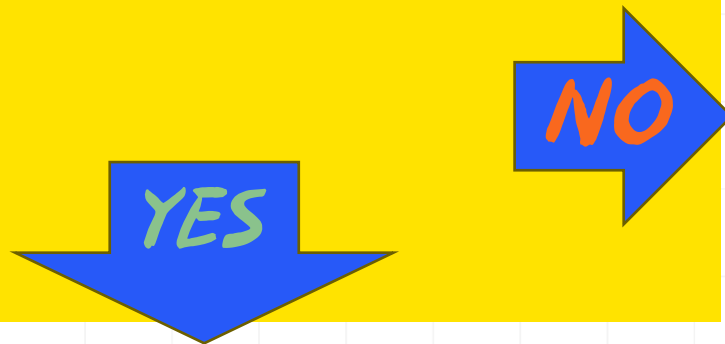
**Action Innovation:** Contribute to material and process research and development through funding or participation in innovation projects.



# RESOURCE USAGE

2.

**Do we use raw materials that contribute to circular material cycles?**



Go to next page/slide

## Actions if the answer is NO:

**Action Materials:** Use materials that promote the regeneration of ecosystems. Ex Responsible Wool Standard.

**Action Materials:** Use materials or material combinations that can end up in a material cycle when the product is used up

**Action Design:** Avoid unnecessary mixing multiple types of materials in a product by exploring innovative design solutions to create desirable functions with as few types of materials as possible.

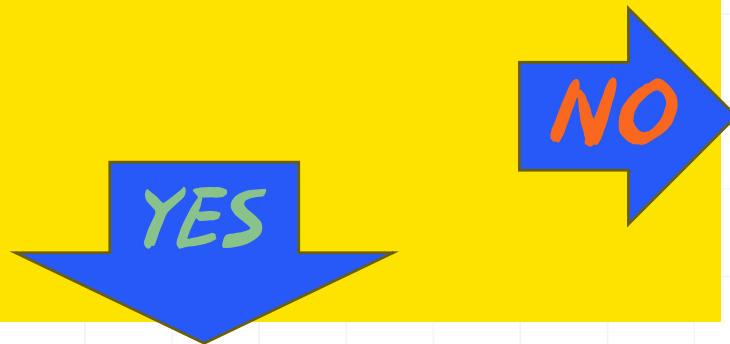
**Action Design:** Explore design solutions which enable separation of materials and components from different material cycles.

**Action Innovation:** Contribute to material and process research and development through funding or participation in innovation projects.

# RESOURCE USAGE

3.

**Do we use the best available production techniques for reducing energy, water and chemical consumption?**



Go to next page/slide

## Actions if the answer is NO:

**Action Production:** Ensure that production is powered by renewable energy and use best energy-efficient production techniques.

**Action Production:** Use color and finishing processes that involve less water consumption.

**Action Production:** Use production techniques where fewer chemicals are needed and these chemicals are used more efficiently.

**Action Production:** Team up with partners in the supply chain to optimize resource efficiency.

**Action Production:** Resource efficiency requires continuous improvement, with ongoing monitoring and implementation of corrective actions. Consider setting targets for areas such as material consumption, water usage, waste water treatment, climate impact and chemical usage.

# RESOURCE USAGE

4.

**Do we strive for an efficient use of materials in our manufacturing processes?**



Go to next page/slide

## Actions if the answer is NO:

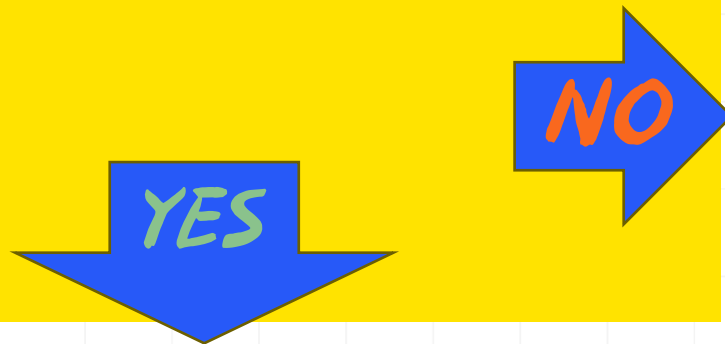
**Action Design:** Designing products for minimal material consumption without losing basic purpose and function.

**Action Business model:** Explore opportunities for industrial symbiosis, where waste material is used as raw materials in new processes.

# RESOURCE USAGE

5.

Do we have methods to counteract overproduction?



Go to next page/slide

## Actions if the answer is NO:

**Action Design:** Review the range to avoid similar models and variants.

**Action Business model:** Develop a model to work with demand-driven production.

**Action Production:** Regularly review routines and systems for production planning, sales and inventory to minimize the risk of overproduction. E.g. lowering variants of similar styles and focusing on season-neutral styles rather than fast fashion cycles can help.

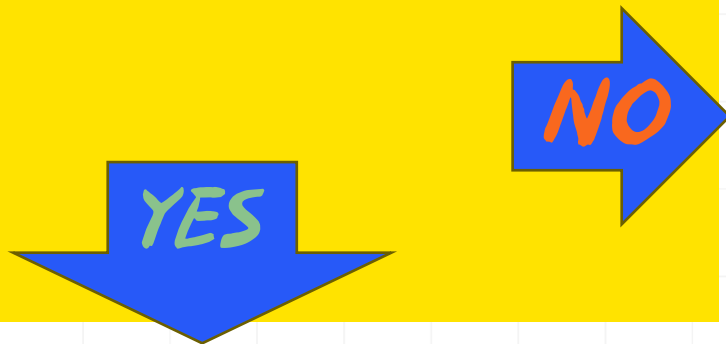
**Action business model:** Develop internal systems and routines to activate deadstock.

# LIFESPAN

# LIFESPAN

6.

Have we ensured that the product lasts for intended use and that the product's aesthetic condition and functions are not impaired by normal use?



Go to next page/slide

## Actions if the answer is NO:

**Action Materials:** Use materials with suitable properties for the intended purpose of the product. (wear resistance, color fastness, washing resistance, etc.).

**Action Materials:** Use materials which are quality assured regarding durability and that the requirements are in line with expected normal use.

**Action design:** Avoid unnecessary mixing multiple types of materials in a product by exploring innovative design solutions to create desirable functions with as few types of materials as possible.

**Action Design:** Reinforce or design out weak points, for example by constructing the product to resist wear and tear (abrasion).

**Action Business Model:** Provide services for restore condition and functions.

**Action: Communication:** Provide knowledge and inspiration on how the customer can restore condition and/or function on their own.

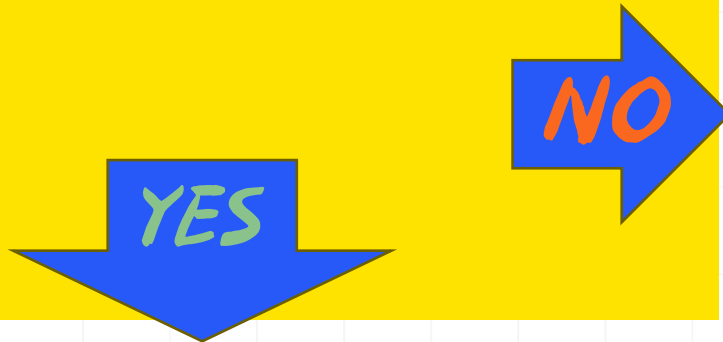
**Action Design:** Ensure the aesthetic durability of the product so that it lasts over time. Ex. timeless versus iconic design.

**Action Business Model:** Provide upgrading of the product as a service to the customer.

# LIFESPAN

7.

**Have we ensured that the product does not emit pollution in the user phase, for example submitting harmful chemicals or microplastics?**



Go to next page/slide

## **Actions if the answer is NO:**

**Action Materials:** Use materials that do not risk emitting pollution during the user phase. Ex. through standard 100 by OEKO-TEX.

**Action Materials:** Regularly test your materials regarding emissions and replace materials/components that do not meet the requirements.

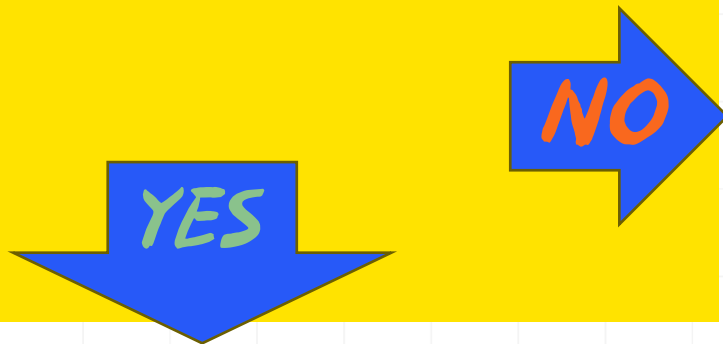
**Action Production:** Work with production processes to reduce the risk of contamination during the user phase.

**Action Innovation:** Contribute to material development through funding or participation in innovation projects.

# LIFESPAN

8.

Have we designed the product so that its active life can be extended during the user phase, for example, that size can be adjusted?



Go to next page/slide

## Actions if the answer is NO:

**Action Design:** Design products with versatile and customizable sizing and fit.

**Action Design:** Design features that allow the user to adjust the size during the user phase.

**Action Materials:** Enable restoration of functions. E.g. impregnation.

**Action Materials:** Make the products so that it is easy to recondition them.

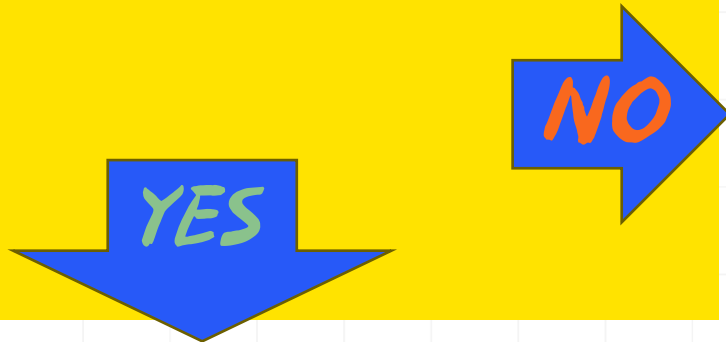
Not applicable for all stakeholders in the value chain



# LIFESPAN

9.

Have we designed the product so it can work in different contexts and for different types of needs?



Go to next page/slide

## Actions if the answer is NO:

**Action Design:** Design the product to be as versatile and useful as possible without losing its original purpose.

**Action Communication:** Provide inspiration and information on how to use the product in a more versatile way.

**Action Business model:** Review the range and investigate the possibilities of reducing the number of similar items and at the same time re-aligning the revenue streams from volume sales to service development.

# LIFESPAN

10.

**Do we facilitate a resource efficient user phase?**



Go to next page/slide



## Actions if the answer is NO:

**Action Materials:** Make the product so that it is easier for the customer to care for it.

**Action Design:** Help the final customer activate their wardrobe through inspiration and styling tips and community.

**Action Business model:** Provide services and/or infrastructure for customer customization in order to create a better product for the customer.

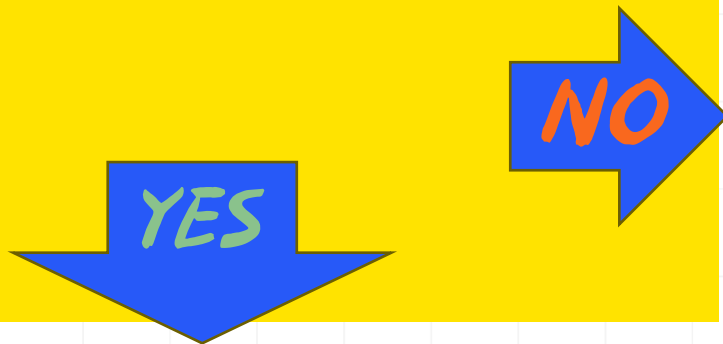
**Action Communication:** Provide inspiration and information on how to take care of the product in a sustainable way. Think of care instructions as a user manual for the textile product, potentially leading to more satisfied customers. E.g. Utilize tools such as Clevercare and Cleanright to share important information with your customers.

# REDESIGN & REMAKE

# REDESIGN & REMAKE

11.

**Do we provide services to extend the life of the product? e.g. adjust, change, refurbish, repair, restore or update.**



Go to next page/slide

## **Actions if the answer is NO:**

**Action Business model:** Provide services/infrastructure to repair or update products that are no longer used so that they fit, for example, current assortment.

**Action Business model:** Provide restoration of the product's aesthetic condition and properties e.g. recoloring, impregnation etc.

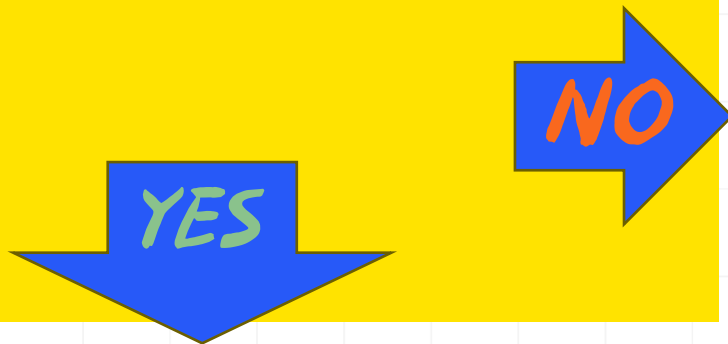
**Action Communication:** Provide inspiration, information or other content so that the customers can mend or update the products themselves via website/social media/store.

**Action Design:** Facilitate future upgrade or redesign of the product through design, material selection, construction and component selection.

# REDESIGN & REMAKE

12.

Do we provide spare parts?



Go to next page/slide

## Actions if the answer is NO:

**Action Business model:** Offer relevant spare parts, either as customer service or as a new revenue opportunity.

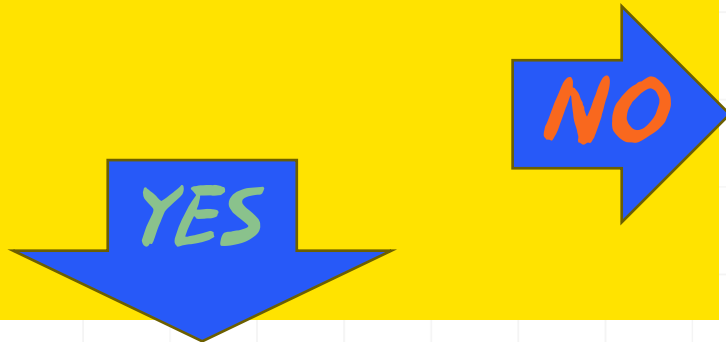
**Action Communication:** Offer inspiration and instructions to the customer and refer to where to find relevant spare parts.

**Action Design:** Use constructions that enable efficient disassembly so critical parts can be replaced when worn out or upgraded.

# REDESIGN & REMAKE

13.

Do we work proactively to promote the reuse of our products?



Go to next page/slide

## Actions if the answer is NO:

**Action Business model:** Create an infrastructure to enable secondhand business.

**Action Business model:** Investigate opportunities for product rental by asking the following questions:

- In what way would renting create value for the customer?
- Is the product suitable for rental?
- Would a leasing service have the potential to reduce production volumes and contribute to resource efficiency?

**Action Communication:** Provide inspiration, information or other content to help the customers to reuse, mend, update the products themselves via website/social media/store.

**Action Design:** Ensure that the product is of good quality (materials, function, aesthetics) so that it can be reused in circular systems to a high value e.g. on the secondhand market.

# RECYCLING

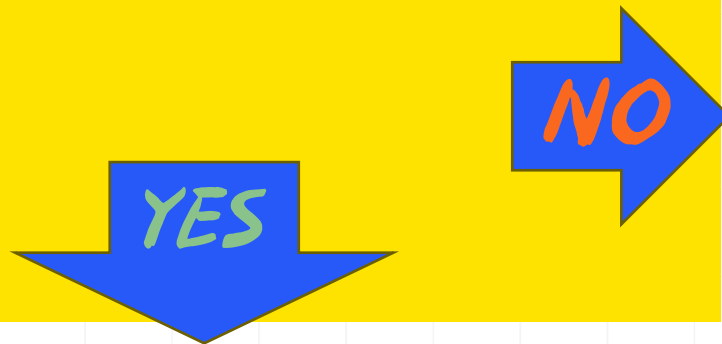
# RECYCLING

14.

Is the product designed to be easily taken apart for, e.g. remanufacturing or material recycling?

Or

Can the material easily be separated from other materials?



Go to next page/slide

## Actions if the answer is NO:

**Action Design:** Enable more efficient disassembly of e.g. zippers, buttons or garment parts without risking the garment's function. Ex. through modular design, or by constructing with fewer garment parts.

**Action Design:** Avoid shortcuts that make it immediately more difficult to disassembly a garment, e.g. glue and spacers where not needed.

**Action Design:** Avoid assembling methods that make disassembly difficult.

**Action Production:** The development of techniques for disassembling are proceeding. Is there any new feasible technique which matches your product?

**Action Materials:** The development of techniques for fiber separation are proceeding. Is there any new feasible technique which matches your product?

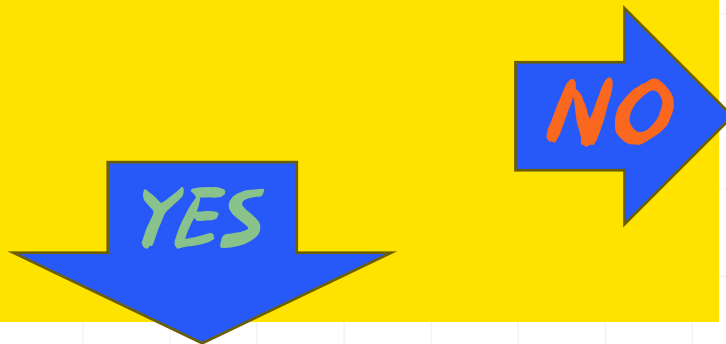
**Action Innovation:** Participate in innovation projects to develop solutions for efficient disassembly.



# RECYCLING

15.

Can the product be recycled into useful and commercially viable materials when the product is used up and can no longer be reused in any other way?



Go to next page/slide

## Actions if the answer is NO:

**Action Materials:** Switch to a recyclable material without losing the product's purpose or properties.

**Action Materials:** Investigate the product's recyclability by using a classification tool for recycling of textiles such as RISE provides: LINK to Framework for circular textiles:  
<https://www.ri.se/en/what-we-do/projects/framework-for-circular-textiles>

**Action Design:** Avoid non-recyclable materials by changing the product's and the material's design and construction to enable desirable properties.

**Action Design:** Use modular design that enables separation of material types that requires different processes for recycling.

**Action Innovation:** Contribute to material and/or technology development for recycling through funding or participation in innovation projects.

**Action Materials:** Ensure traceability and transparency throughout the value chain to enable recycling. Document constituent components in such a way that the material can be recycled in a high-value way and that relevant info can be shared with recycling partners.

**Action Communication:** Provide customers with information of how the textile/product should be taken care of during lifetime and recycled at end of life.

# Visionary Example of LIFE CYCLING

Designing with the classification  
framework in mind

LINK to Framework for circular textiles:

<https://www.ri.se/en/what-we-do/projects/framework-for-circular-textiles>

## MechCotton Y3

>95% cotton. Medium fiber length or longer (>24 mm). Color sorted. Thin to very dense woven and weft knitted fabrics. Tolerance of PVC prints in the batch (<10%).

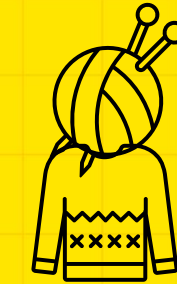


## MechCotton Y1

100% cotton. >Long fiber length or longer (>29 mm). Color sorted. Medium to very dense weft knitted fabrics.



Start



## MechCotton N2

>98% cotton. All fiber lengths. Color sorted. Medium to very dense woven, weft knit and non-woven constructions. Tolerance of PVC prints in the batch (<10%).

## ChemCotton3

>98% cotton. All colors. Pure materials. No anti-wrinkle treatment.



100% Viscose  
Transfer to a  
"circle" for Viscose



# RECYCLING

16.

Have we ensured that the product's possible functional chemicals do not hinder material recycling?

In this case functional chemicals means a chemical added for achieving certain functions in product and further processes and will follow the final product until end of life.



Go to next page/slide



**Actions if the answer is NO:**

**Action Materials:** Switch to alternative dyes and functional chemicals which are compatible with intended recycling process.

**Action Materials:** Change to a recyclable material with better properties based on the intended function where the problematic chemicals are not needed.

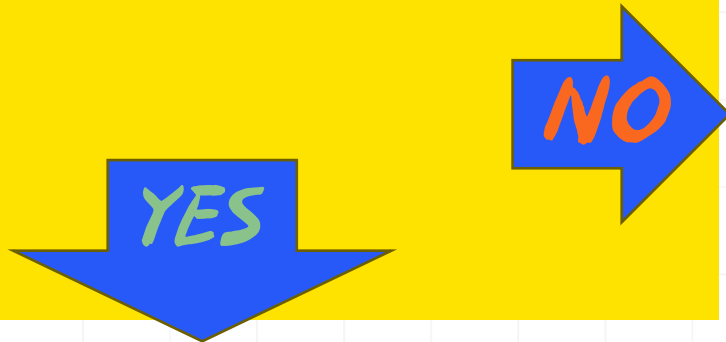
**Action Design:** Use modular design that allows separation of the parts that are problematic to recycle.

**Action Materials:** Ensure traceability and transparency throughout the value chain to enable recycling.

# RECYCLING

17.

**Do we work proactively to promote remanufacturing and recycling of our products that cannot be reused?**



Go to next page/slide

## **Actions if the answer is NO:**

**Action Design:** Exploring remake as a method to increase the quality and attractiveness of discarded products.

**Action Communication:** Provide customers with information of how the textile/product should be taken care of during lifetime and recycled at end of life.

**Action Innovation:** Collaborate with textile recyclers to find new solutions for recycling of discarded products that cannot be reused or redesigned.

**Action Innovation:** Participate in innovation projects to promote textile recycling.

**Action Design:** Avoid multilayers of different material (chemical structure) which cannot be separated.

# ACTION PLAN & PRIORITIES

# ACTION PLAN

Product/ Product category:	<b>MATERIALS</b>	<b>DESIGN</b>	<b>BUSINESS MODEL</b>	<b>PRODUCTION</b>	<b>COMMUNICA- TION</b>	<b>INNOVATION</b>
Fill in what you already do today						
Fill in actions that is possible to do.						
Fill in one activity that leads towards your circular strategy which you could act on already today!						

# ACTIONS TO PRIORITISE

1. ...

2. ...

3. ...

4. ...

5. ...

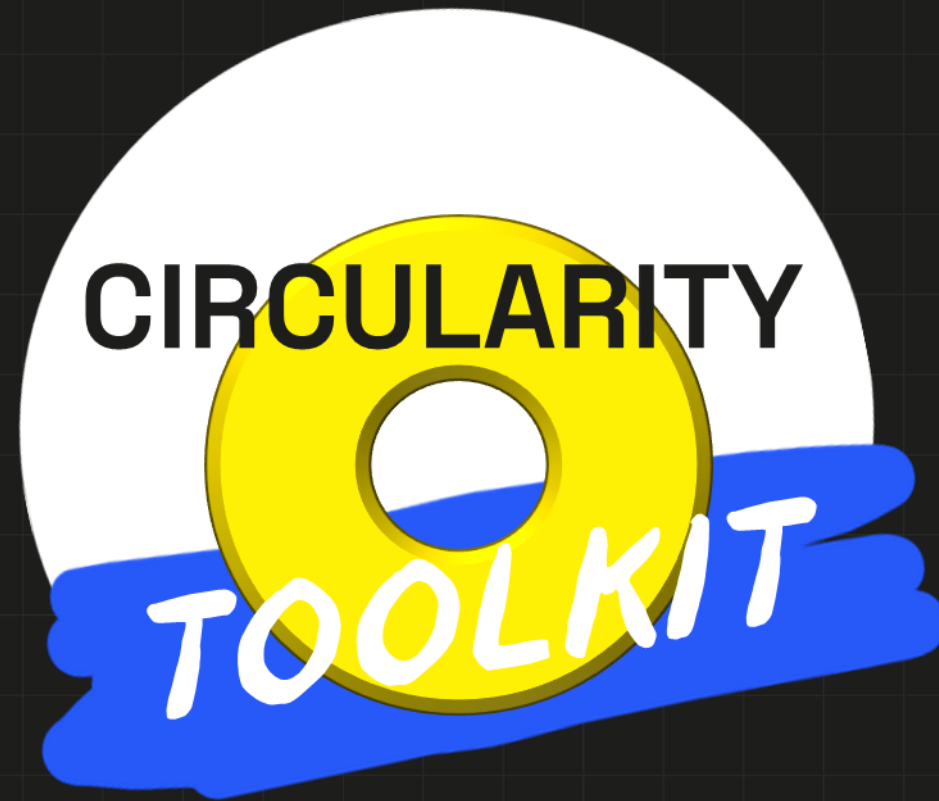
6. ...

7. ...

8. ...

9. ...

Good Work!







**SCIENCE**  
**PARK**  
BORÅS