

SUSTAINABILITY IN FIBRES

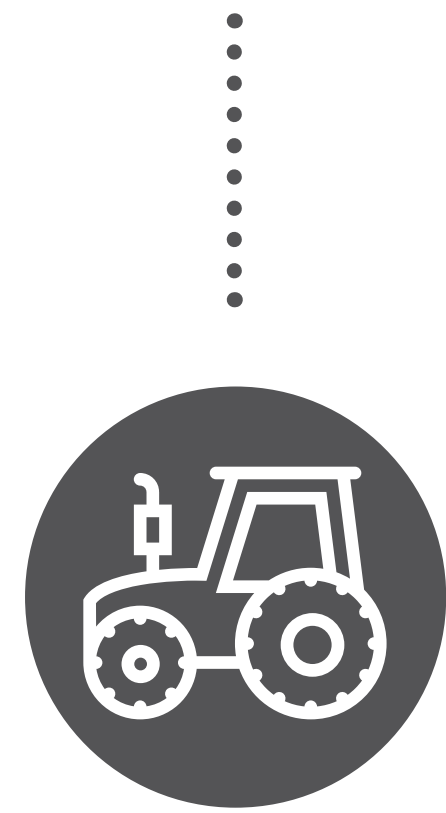


SUSTAINABILITY IN FIBRES
INTRODUCTION



WHAT DO I NEED TO LEARN ABOUT SUSTAINABILITY IN FIBRES? CRADLE-TO-GRAVE DESIGN

RAW MATERIAL EXTRACTION
Synthetics, Farming and Harvesting



DESIGN
Sketching, Pattern Making,
Sampling and Sourcing



TRANSPORTATION



CONSUMER USE
Washing, Drying
and Ironing



TEXTILE PRODUCTION
Spinning, Weaving,
Bleaching and Dyeing

**GARMENT
MANUFACTURING**
Cutting, Sewing,
Finishing and Accessories

RETAIL
Packaging, Point-of-sale
signage and Merchandising

DISPOSAL

WHAT DO I NEED TO LEARN ABOUT SUSTAINABILITY IN FIBRES?
CRADLE-TO-GRAVE DESIGN
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WHAT DO I NEED TO LEARN ABOUT SUSTAINABILITY IN FIBRES? CRADLE-TO-CRADLE DESIGN



WHAT DO I NEED TO LEARN ABOUT SUSTAINABILITY IN FIBRES?
CRADLE-TO-CRADLE DESIGN
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FIBRE CATEGORISATION

NATURAL FIBRES



PLANT-BASED

Also known as cellulose-based. These are fibres that are harvested from plants.

Examples:

- Cotton
- Linen
- Hemp
- Jute.

ANIMAL-BASED

Also known as protein-based. These are fibres that come from animal coats, or products produced by animals.

Examples:

- Wool
- Silk
- Down

MAN-MADE FIBRES



REGENERATED CELLULOSE

Fibres made from wood and plant-based fibres which are both processed with chemicals to soften them for use.

Examples:

- Viscose
- Modal
- Lyocell
- Cupro
- Acetate (Modified)

SYNTHETIC

Fibre made from oil-based polymers.

Examples:

- Polyester
- Nylon
- Acrylic
- Polypropylene
- Spandex

WHAT DO I NEED TO LEARN ABOUT SUSTAINABILITY IN FIBRES?

FIBRE CATEGORISATION

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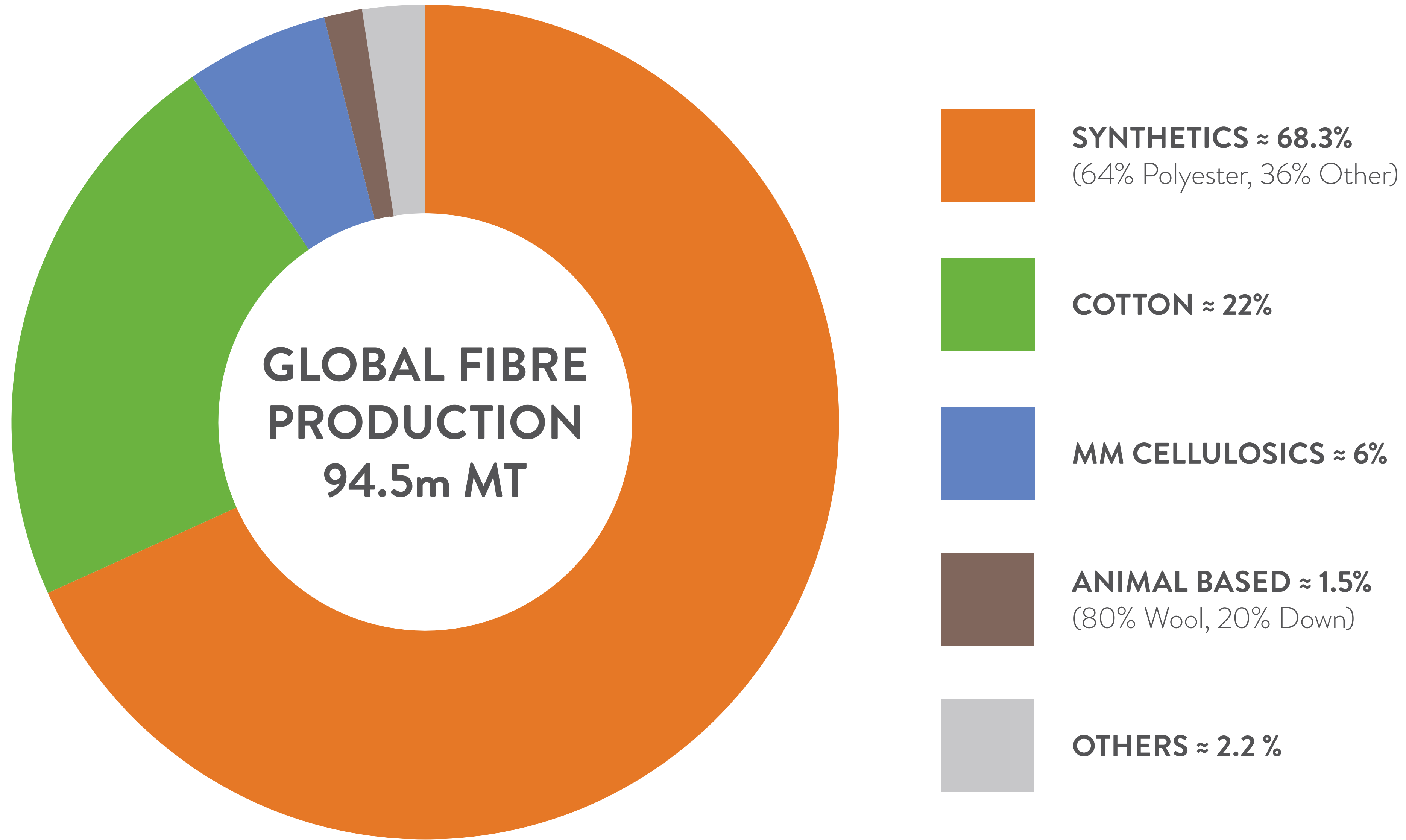


Image credit: Textile Exchange

SLIDESHOW: T5SF-02-2

WHAT DO I NEED TO LEARN ABOUT SUSTAINABILITY IN FIBRES?

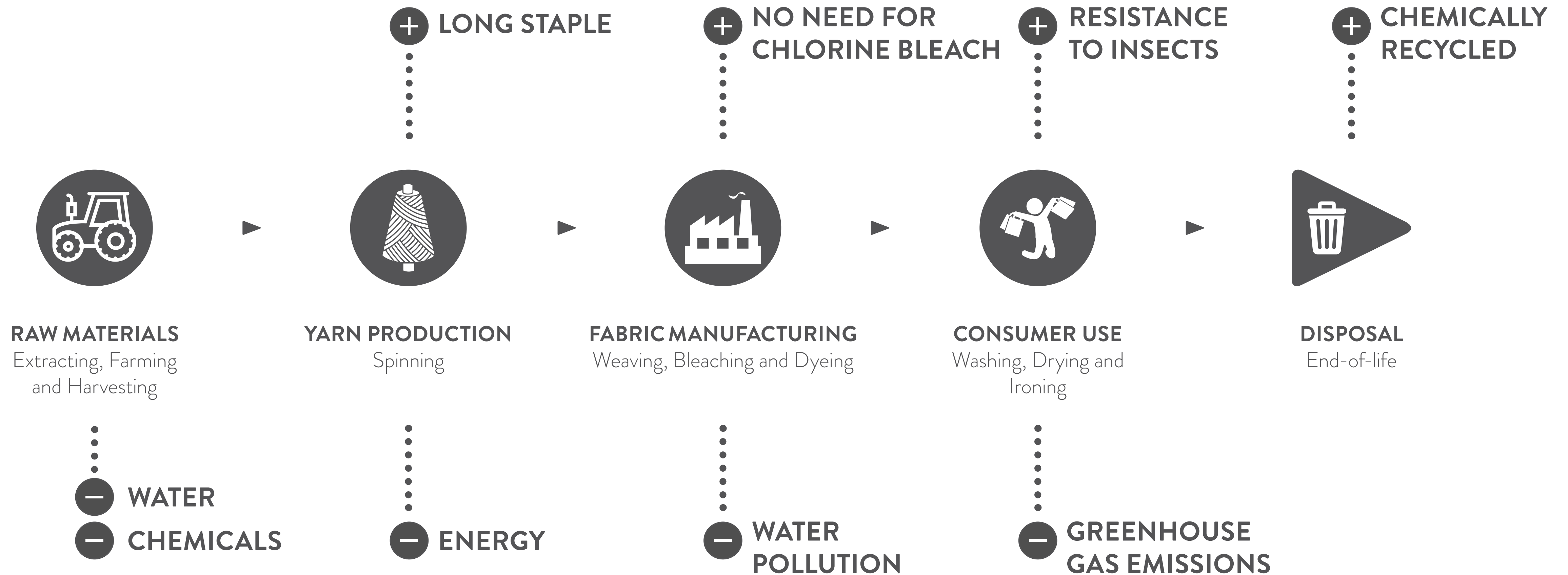
FIBRE CATEGORISATION

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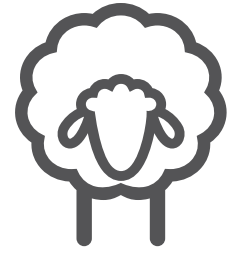
Source:
Textile Exchange (2017), Preferred Fiber & Materials Market report
2017, <http://textileexchange.org/2017-market-reports/>



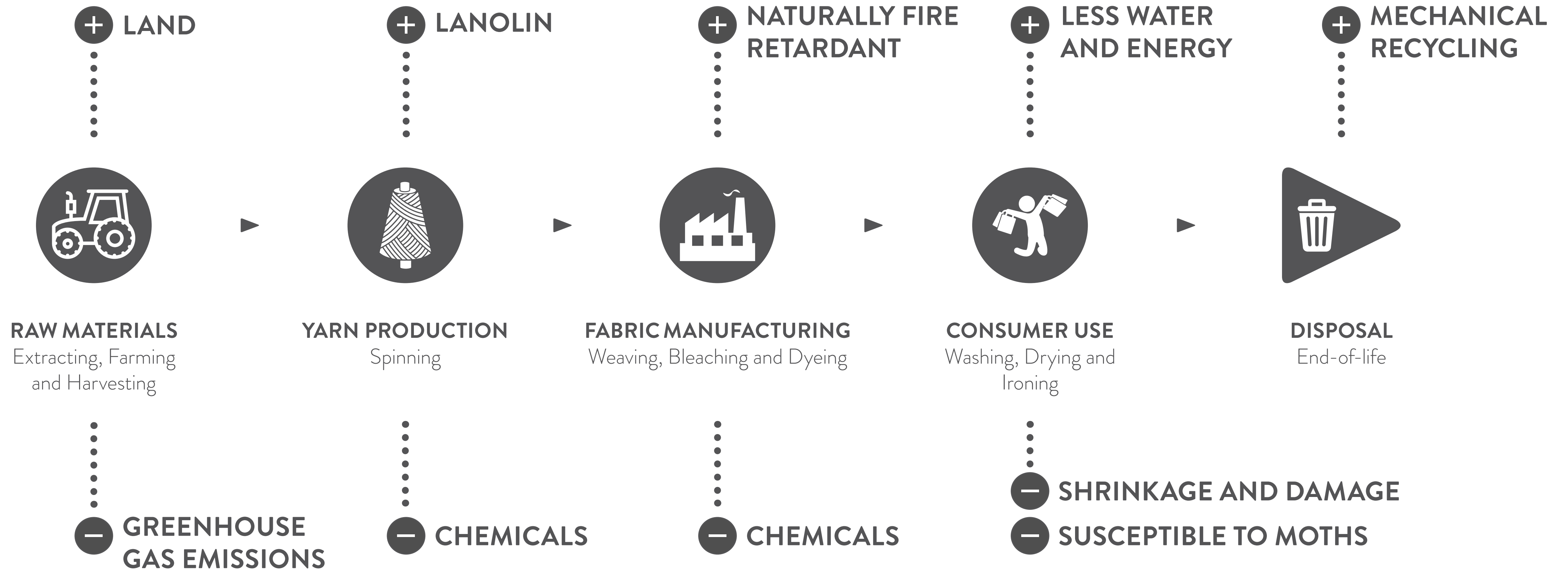
WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES? NATURAL | PLANT BASED: COTTON



WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES?
NATURAL | PLANT BASED: COTTON
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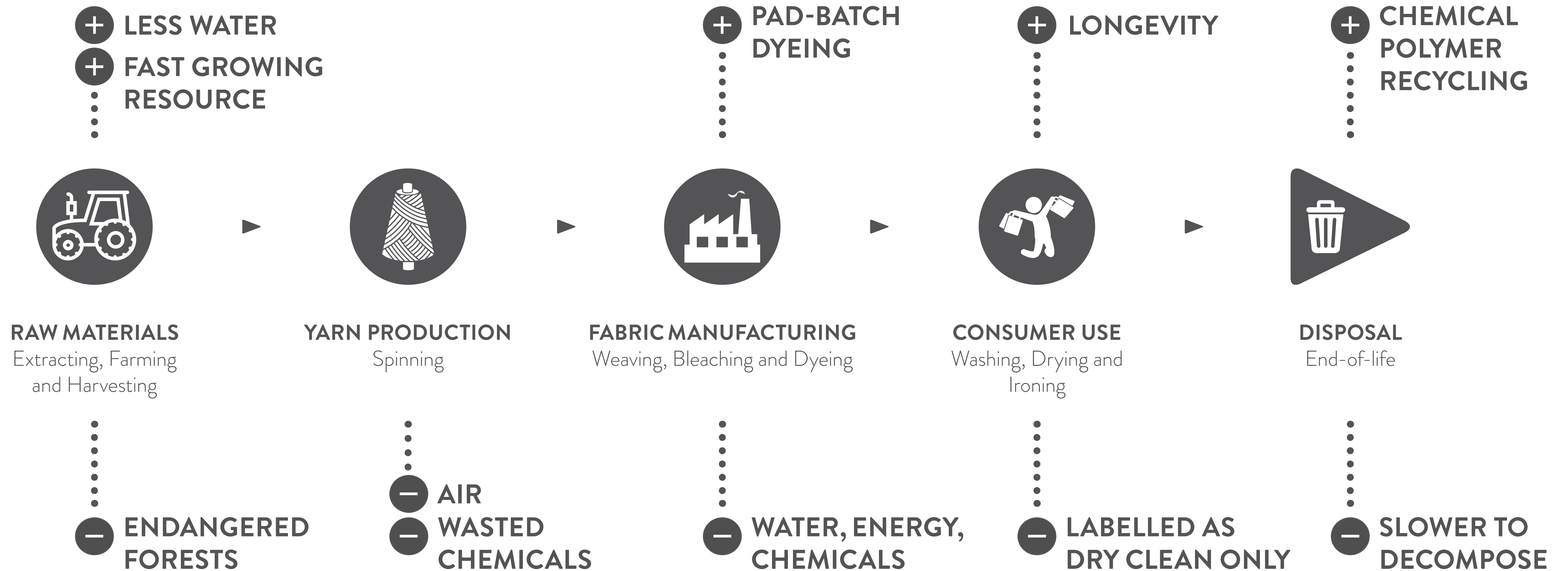
WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES? NATURAL | ANIMAL BASED: WOOL



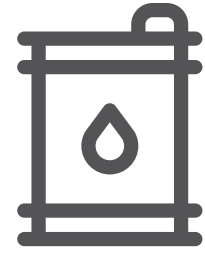
WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES?
NATURAL | ANIMAL BASED: WOOL
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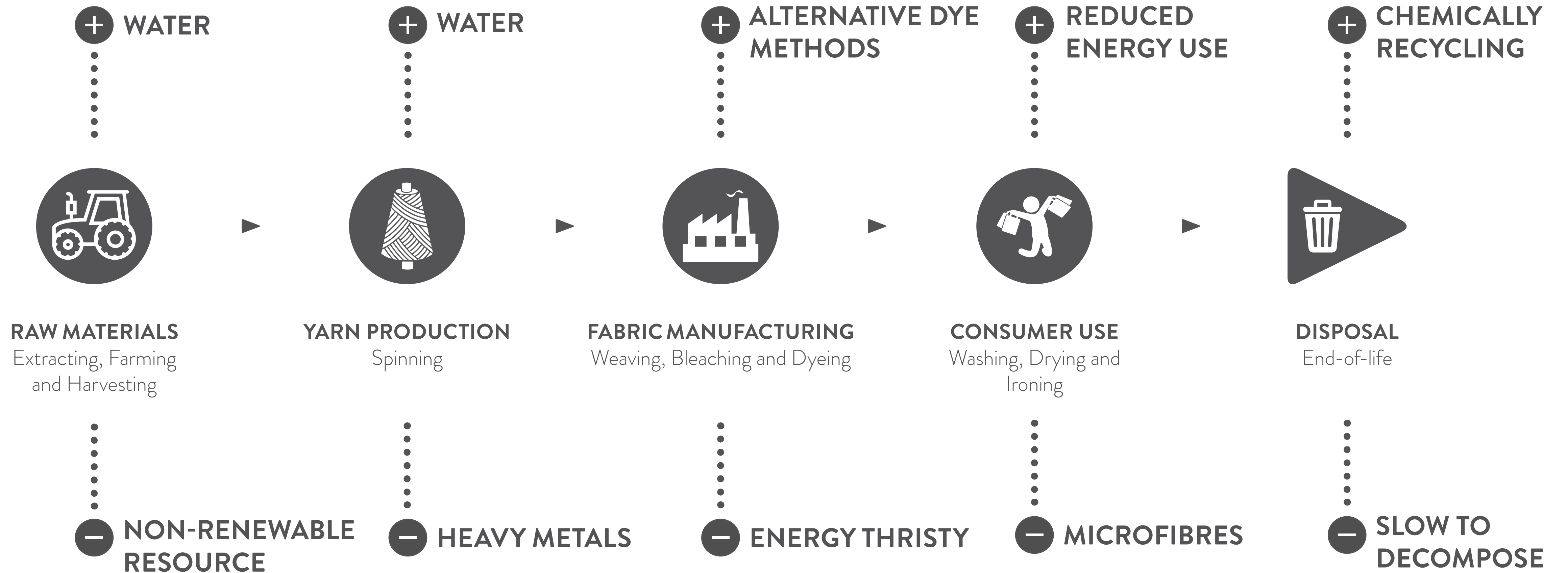
WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES? MAN-MADE | REGENERATED CELLULOSE: VISCOSE



WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES?
MAN-MADE | REGENERATED CELLULOSE: VISCOSE
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WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES? MAN-MADE | SYNTHETIC: POLYESTER



WHAT ARE THE ENVIRONMENTAL IMPACTS OF FIBRES?
MAN-MADE | SYNTHETIC: POLYESTER
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Outershell

84% Polyester

12% Viscose

4% Elastane

100% Polyester

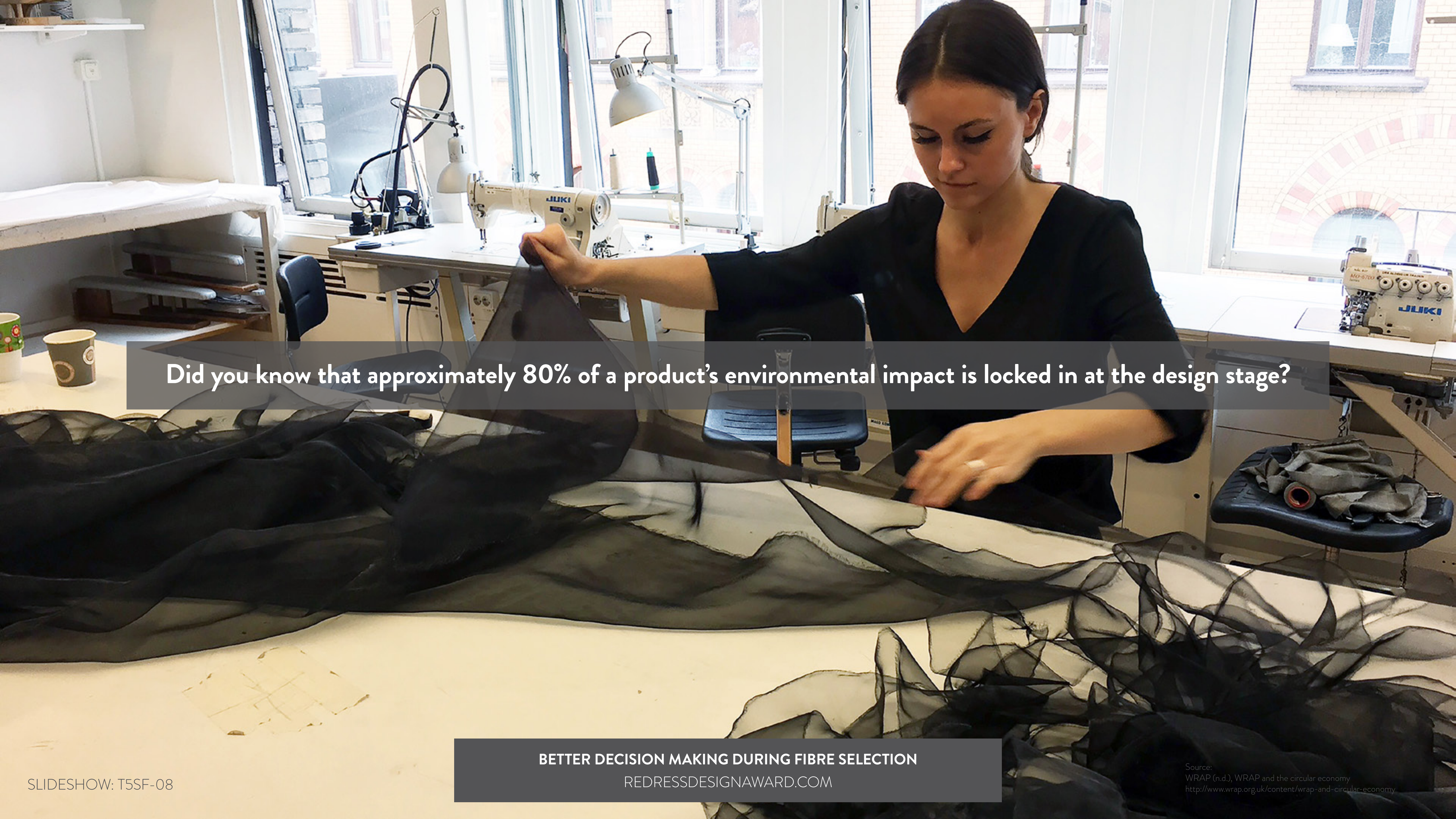
Lining



SUSTAINABILITY IN FIBRES

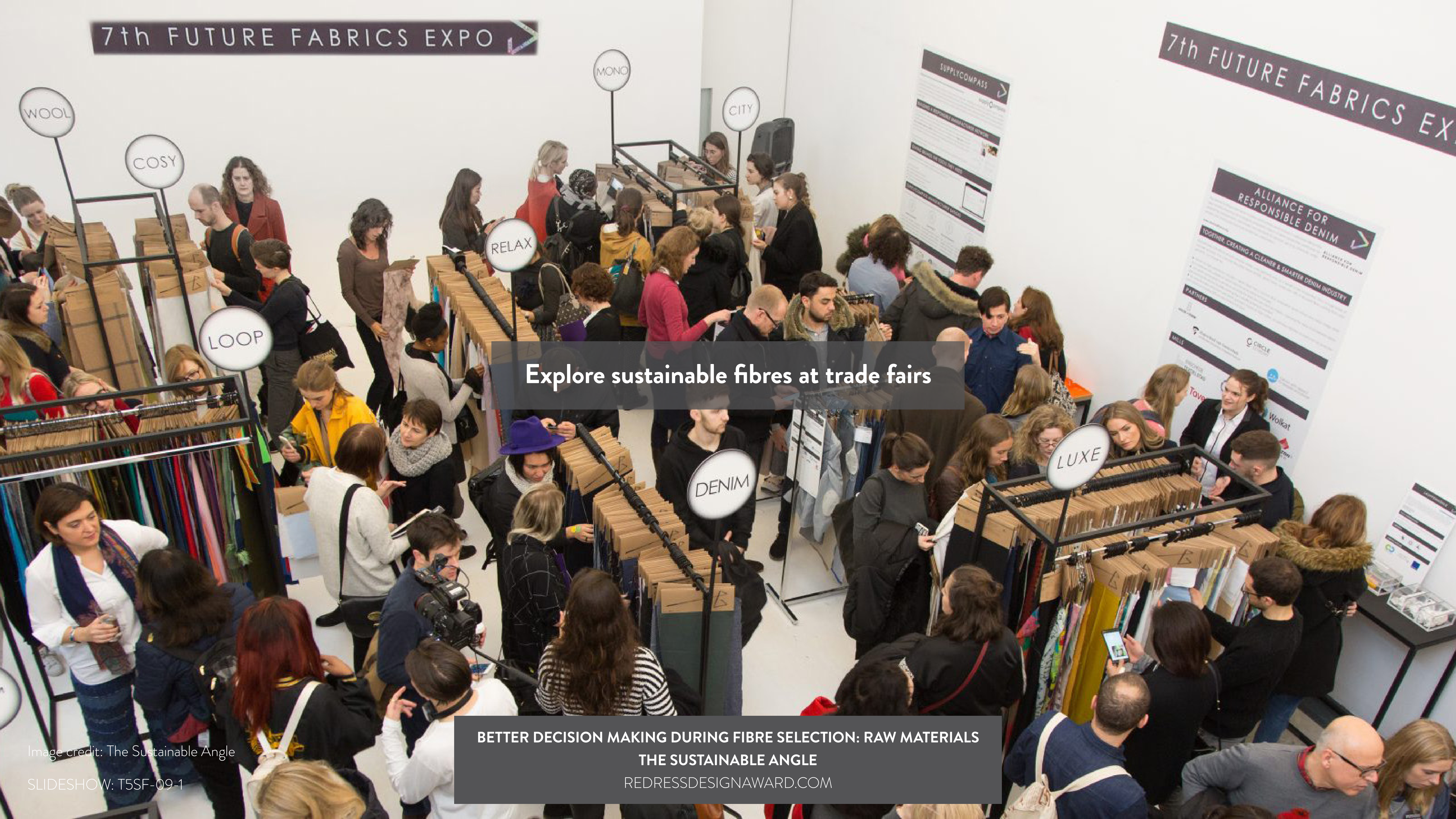
BETTER DECISION MAKING DURING FIBRE SELECTION





Did you know that approximately 80% of a product's environmental impact is locked in at the design stage?

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Explore sustainable fibres at trade fairs

BETTER DECISION MAKING DURING FIBRE SELECTION: RAW MATERIALS
THE SUSTAINABLE ANGLE
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**BETTER DECISION MAKING DURING FIBRE SELECTION: RAW MATERIALS
NATURAL - PLANT-BASED' FIBRES ALTERNATIVES**

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BETTER DECISION MAKING DURING FIBRE SELECTION: RAW MATERIALS
'NATURAL - PROTEIN-BASED' FIBRES ALTERNATIVES
STELLA MCCARTNEY | BOLT THREADS
REDRESSDESIGNAWARD.COM

Image credit: Bolt Threads

SLIDESHOW: T5SF-09-3



**BETTER DECISION MAKING DURING FIBRE SELECTION: RAW MATERIALS
'MAN-MADE - REGENERATED CELLULOSE' FIBRES ALTERNATIVES**

MARA HOFFMAN

REDRESSDESIGNAWARD.COM

Image credit: Mara Hoffman

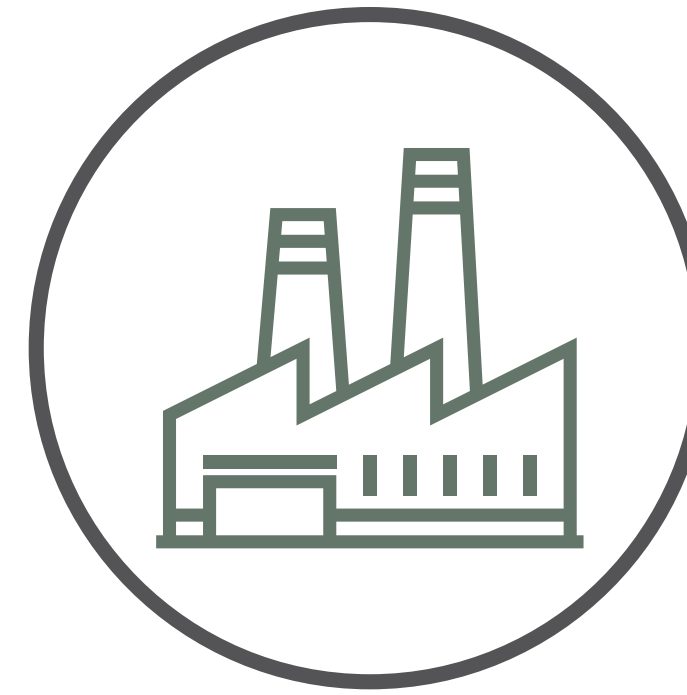
SLIDESHOW: T5SF-09-4



**BETTER DECISION MAKING DURING FIBRE SELECTION: RAW MATERIALS
'MAN-MADE - SYNTHETIC' FIBRES ALTERNATIVES
FINCH DESIGNS
REDRESSDESIGNAWARD.COM**

Image credit: FINCH Designs

SLIDESHOW: T5SF-09-5



YARN PRODUCTION

The apparel industry alone represents 6.7% of global greenhouse gas (GHG) emissions (equivalent to about 3.3 billion metric tons of CO₂-eq), 28% of which is produced by the spinning of yarn from filament and staple fibre.



BETTER DECISION MAKING DURING FIBRE SELECTION: YARN PRODUCTION
ROICA™ V550 FIBRE BY ASAHI KASEI
REDRESSDESIGNAWARD.COM

Image credit: Wolford / Cradle to Cradle

SLIDESHOW: T5SF-10-2

Organic Merino Wool Jumper

Choose size ▾

[Size guide](#)

ADD TO BAG

ID 222096-0610

DEPARTMENT Women

TYPE Knitwear

PRODUCT Organic Merino Wool Jumper

MATERIAL Organic functional merino ⊕

COLOR Blue ⊕

MADE IN CHINA ⊕

CARE INSTRUCTIONS ⊕

With colour-block stripes, this merino jumper is fine-knitted in a full needle stitch. The yarn is a unique ARKET development. The garment's design begins at fibre level, using an optimised combination of yarn weight and needle size to transfer the natural properties of the fibre to the knitted fabric. The jumper has a relaxed fit, with slightly longer silhouette and a high, squared neckline.

- Knitted in 14 gauge
- Part of the Merino Yarn Project
- Knitwear > Crew neck
- : Merino wool 100.00%

SHARE



BETTER DECISION MAKING DURING FIBRE SELECTION: YARN PRODUCTION

ORGANIC WOOL

ARKET

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Image credit: Arket

SLIDESHOW: T5SF-10-3



FABRIC AND GARMENT MANUFACTURING

The total volume of spill from fashion production is on average 25%, but can reach up to 47% of the fabrics and fibres used in production.

**BETTER DECISION MAKING DURING FIBRE SELECTION:
FABRIC AND GARMENT MANUFACTURING**
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PROJECT F.L.X.



WE'VE BUILT AN END-TO-END DIGITAL PLATFORM THAT TRANSFORMS HOW JEANS ARE DESIGNED, MADE AND SOLD

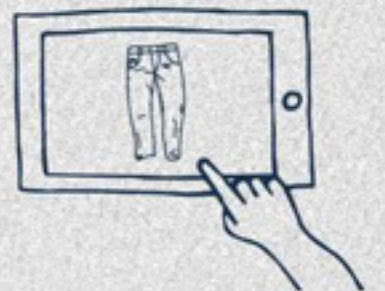
Using advanced technology, we can build a more responsive and responsible supply chain

THE OLD PROCESS THE F.L.X. PROCESS

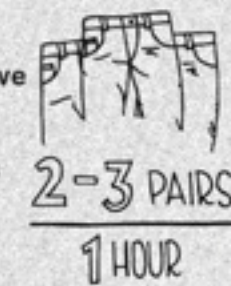
PHYSICAL PROTOTYPING
Physical prototypes can take up to 8 weeks



DIGITAL FINISH DESIGN
2 weeks or less to create a finish design using digital imaging tools



MANUAL PROCESS
Labor-intensive process to finish 2-3 pairs of jeans per hour

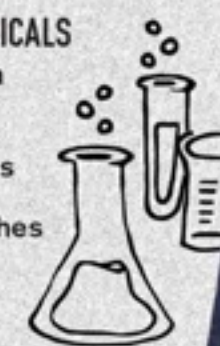


LASER TECHNOLOGY
Finishes applied using automated laser treatment

1 PAIR
90 SEC



MANY CHEMICALS
More than a thousand chemical formulations used to create finishes



A CLEANER JEAN
Just a few dozen chemicals required



SELL WHAT

MAKE WHAT YOU SELL

Less inventory and reduced waste



BETTER DECISION MAKING DURING FIBRE SELECTION:
FABRIC AND GARMENT MANUFACTURING

LEVI STRAUSS & CO

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**BETTER DECISION MAKING DURING FIBRE SELECTION:
FABRIC AND GARMENT MANUFACTURING
KOWTOW**

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Image credit: Kowtow

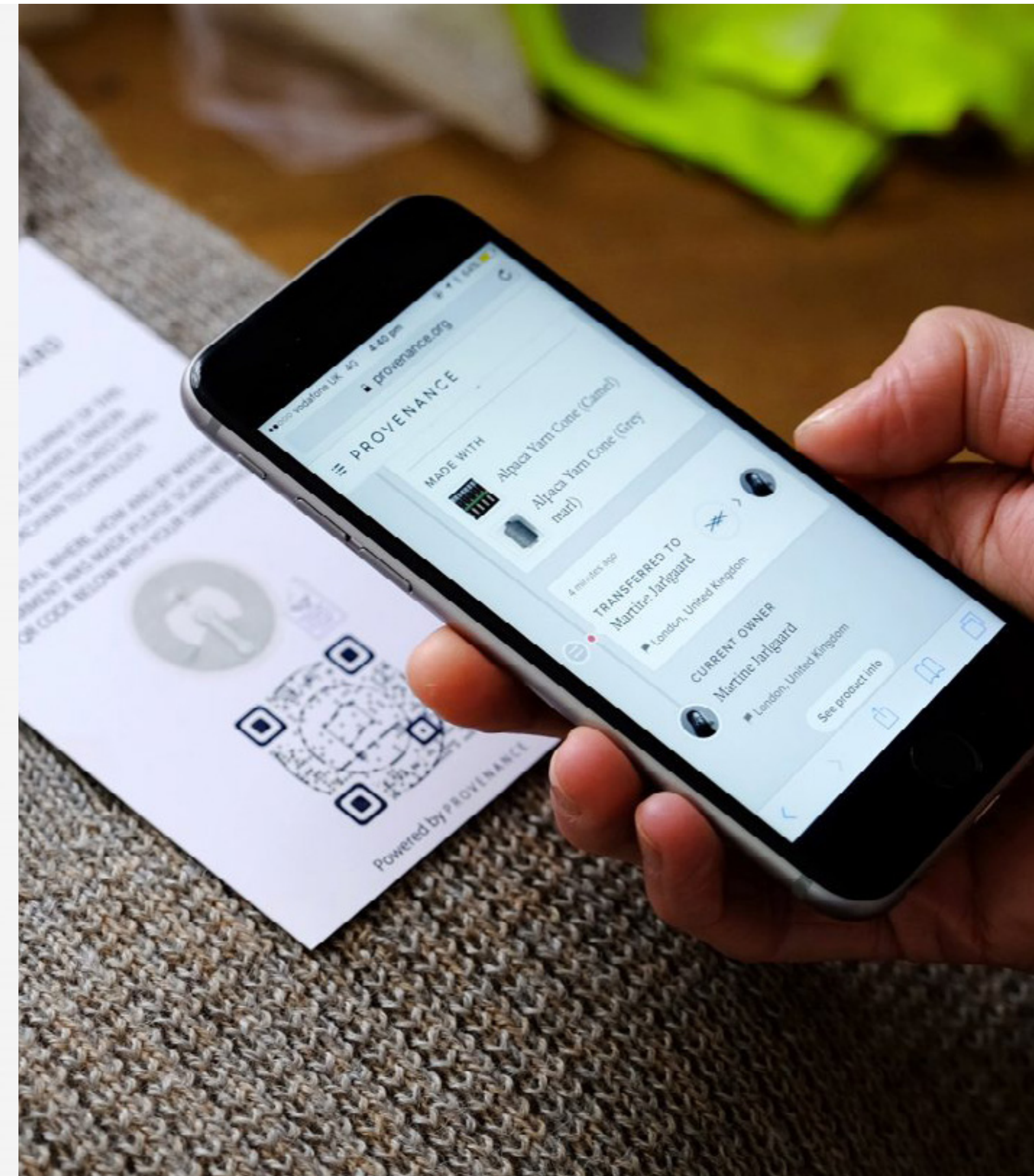
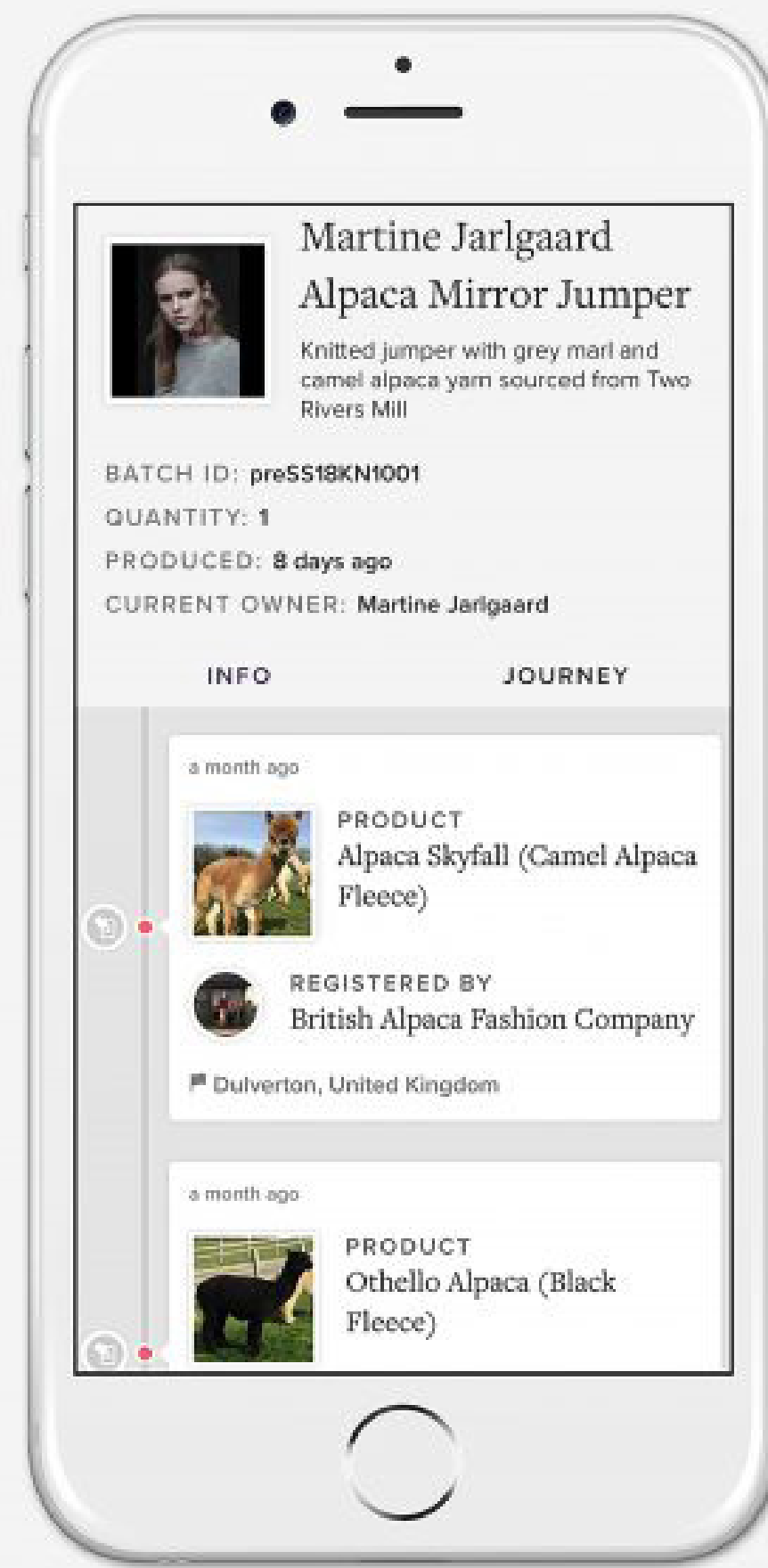
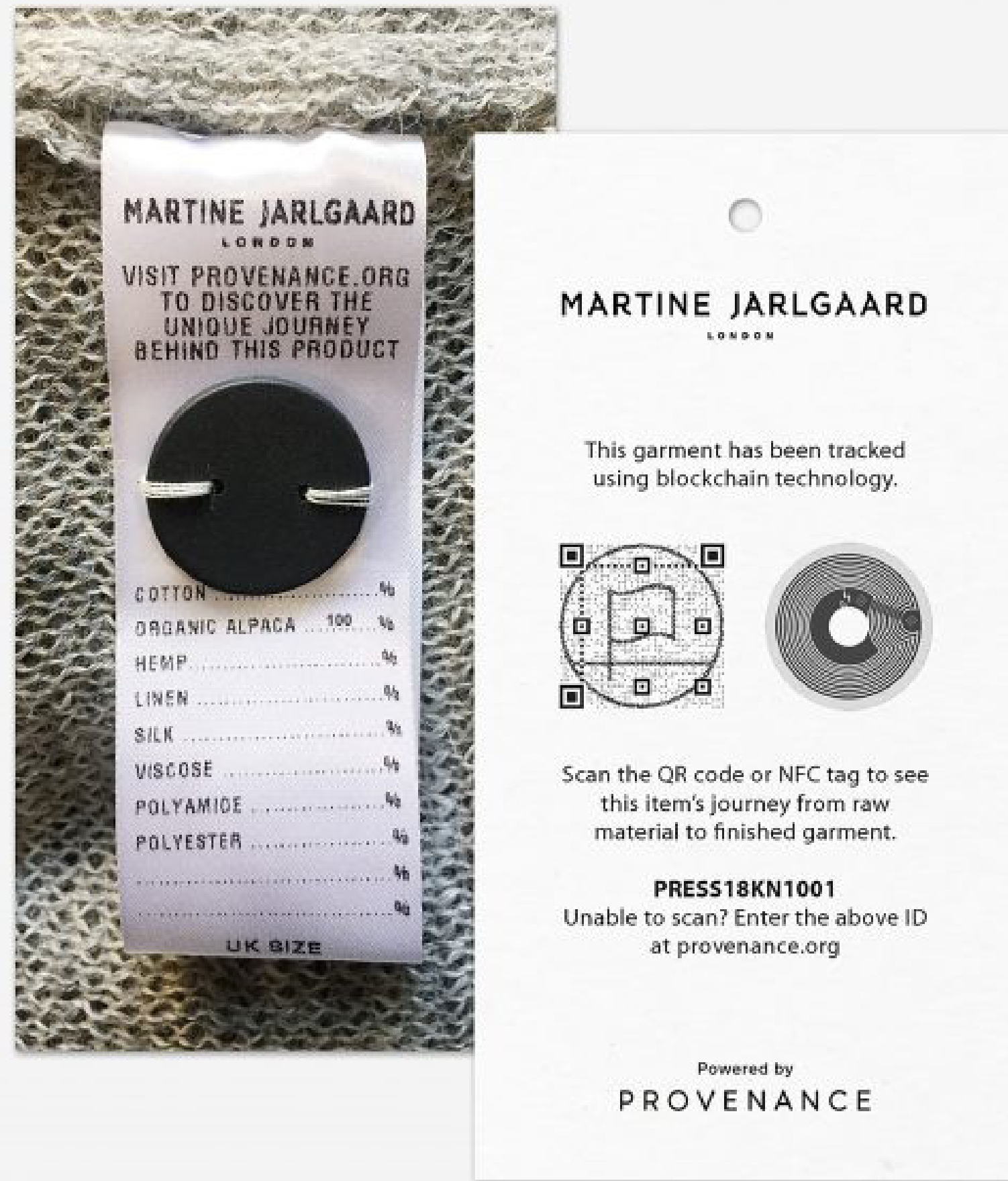
SLIDESHOW: T5SF-11-3



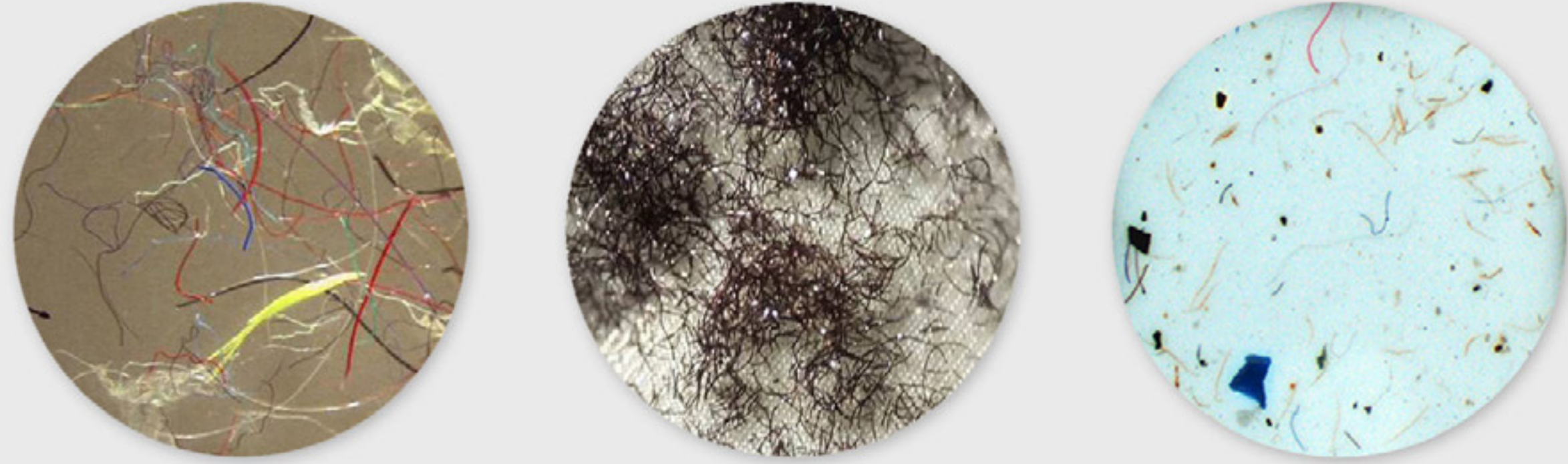
70% of the clothes we throw away are as a result of irreversible damage such as colour fading, stubborn stains or shrinking.

BETTER DECISION MAKING DURING FIBRE SELECTION: CONSUMER USE

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**BETTER DECISION MAKING DURING FIBRE SELECTION: CONSUMER USE
ENABLING TRANSPARENCY IN SUPPLY CHAIN
PROVENANCE X MARTINE JARLGAARD
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Each year, around half a million tonnes of plastic microfibres are released into the ocean due to the washing of garments made from synthetic fibres. This is equivalent to more than 50 billion plastic bottles!

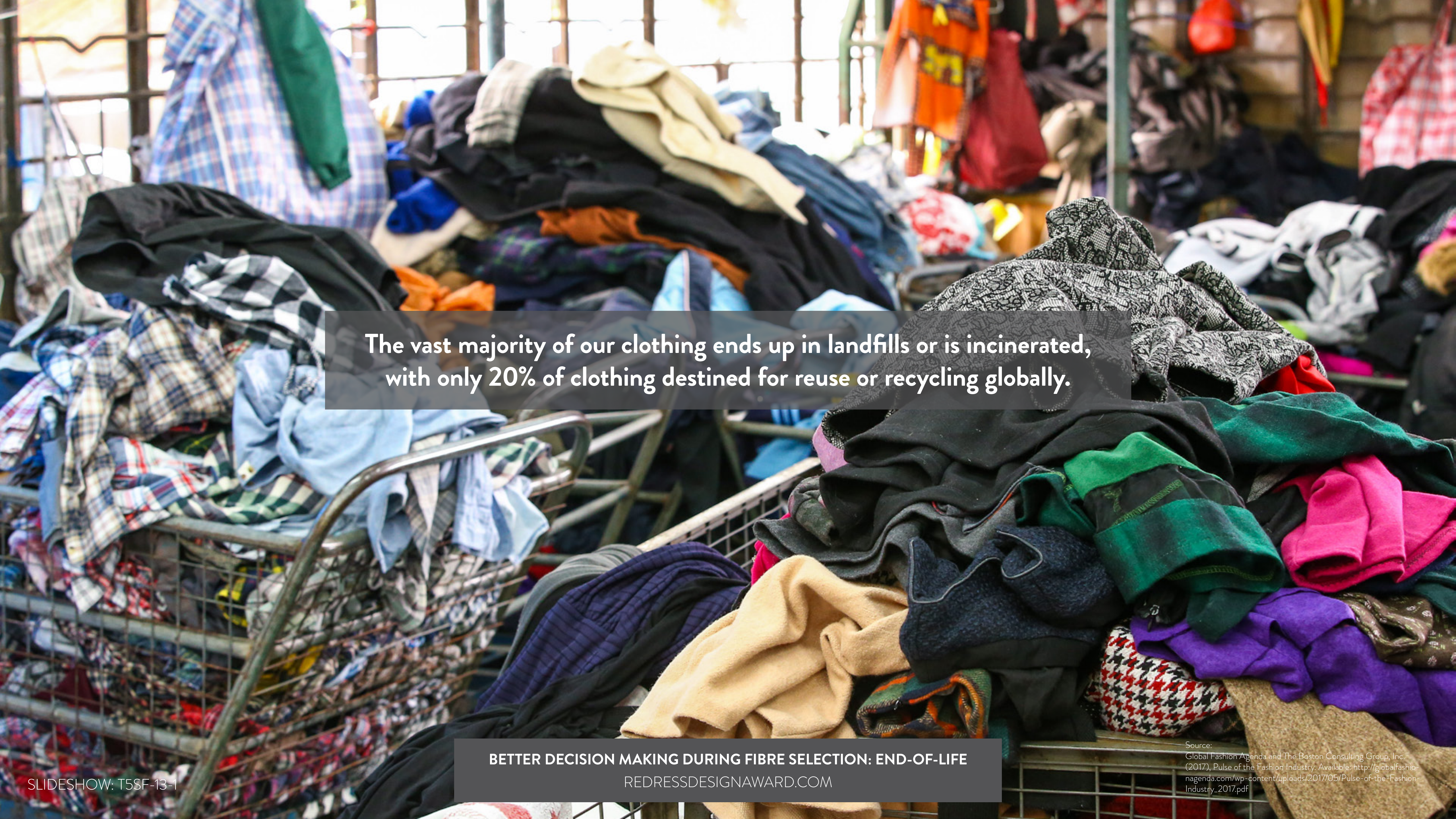
**BETTER DECISION MAKING DURING FIBRE SELECTION: CONSUMER USE
MICROFIBRES**

PATAGONIA X GUPPY FRIEND
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Image credit: Patagonia and Guppyfriend

SLIDESHOW: T5SF-12-3

Source:
Ellen MacArthur Foundation (2017), A New Textiles Economy: Re-
designing Fashion's Future
https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy-Full-Report_Updated_1-12-17.pdf



The vast majority of our clothing ends up in landfills or is incinerated, with only 20% of clothing destined for reuse or recycling globally.

BETTER DECISION MAKING DURING FIBRE SELECTION: END-OF-LIFE

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KATE MORRIS

BETTER DECISION MAKING DURING FIBRE SELECTION: END-OF-LIFE
DESIGNING FOR END OF LIFE
KATE MORRIS
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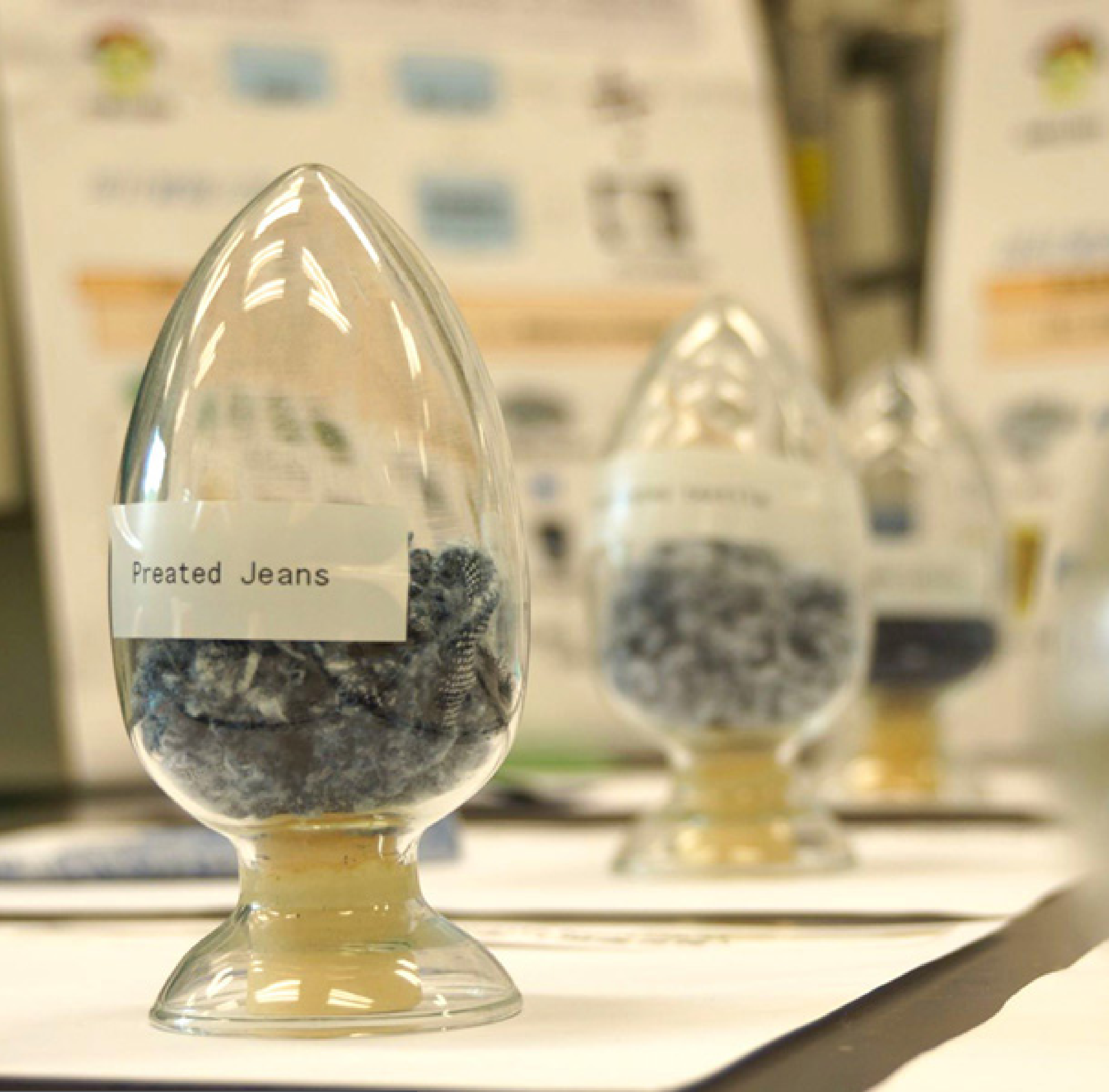


Image credit: Hong Kong Research Institute of Textile and Apparel (HKRITA)

SLIDESHOW: T5SF-13-3

**BETTER DECISION MAKING DURING FIBRE SELECTION: END-OF-LIFE
HONG KONG RESEARCH INSTITUTE OF TEXTILE AND APPAREL (HKRITA)**

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SUSTAINABILITY IN FIBRES
CASE STUDIES





Image credit: Zerobarracento

SLIDESHOW: T5SF-14-1

SUSTAINABILITY IN FIBRES CASE STUDY 1: ZEROBARRACENTO

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Image credit: Zerobarracento

SLIDESHOW: T5SF-14-2

SUSTAINABILITY IN FIBRES CASE STUDY 1: ZEROBARRACENTO

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Image credit: Zerobarracento

SLIDESHOW: T5SF-14-3

SUSTAINABILITY IN FIBRES CASE STUDY 1: ZEROBARRACENTO

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Image credit: EcoAlf

SLIDESHOW: T5SF-15-1

SUSTAINABILITY IN FIBRES CASE STUDY 2: ECOALF

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Image credit: Leila Lina

SLIDESHOW: T5SF-15-2

SUSTAINABILITY IN FIBRES CASE STUDY 2: ECOALF

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Katmandú 3 in 1 Down Jacket Man Black

**20 cups of coffee
= 1 metre Ecoalf
fabric**



Image credit: EcoAlf

SLIDESHOW: T5SF-15-4



SUSTAINABILITY IN FIBRES CASE STUDY 2: ECOALF

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Image credit: Filippa K

SLIDESHOW: T5SF-16-1

SUSTAINABILITY IN FIBRES CASE STUDY 3: FILIPPA K
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| Class 1 | Class 2 | Class 3 | Class 4 |
|--------------------------------------|--|--------------------------------|------------------|
| Recycled cotton | Organic cotton | Linen (LI) Chemical retting | Cotton (C, CTN) |
| Crailar | BCI cotton | Hemp Chemical retting | Viscose (CV, VI) |
| Organic Linen | Lenzing Modal: Edelweiss | Ramie (RA) | Rayon (RY, RA) |
| Linen natural retting | Lenzing Lyocell (Tencel, ten, CLY, LYO) | Modal [®] (CMD, MD) | Cupro (CUP) |
| Organic Hemp | Tri-acetate (CTA, TA) | Polyester (PPT, PES, PE) | Acetate |
| Hemp | Recycled polyester (chemically) | Thermolite | Polyamid (PA) |
| Recycled polyester (mechanically) | Recycled Polyamid (chemically) | Acrylic (PAN) | Elastan/Spandex |
| Recycled Polyamid (mechanically) | PLA (polylactic acid) | Cashmere | Bamboo Viscose |
| Recycled wool | Wool (WO) | | |
| Organic wool | Milk Fibre | | |
| Alpaca wool | Monocel | | |
| Silk (SE) | | | |

SUSTAINABILITY IN FIBRES CASE STUDY 3: FILIPPA K

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| | | | |
|---------------|----------------|----------------|----------------|
| Class 1 7% | Class 2 46% | Class 3 10% | Class 4 37% |
|---------------|----------------|----------------|----------------|



Image credit: Filippa K
SLIDESHOW: T5SF-16-3

SUSTAINABILITY IN FIBRES

EXERCISES & PROJECT BRIEFS



REVIEWING THE ENVIRONMENTAL IMPACT OF FIBRES

FIBRE:

COTTON

WOOL

VISCOSE

POLYESTER

| | | | | | |
|-----------------------|--|--|--|--|--|
| <p>POSITIVE +</p> | | | | | |
|-----------------------|--|--|--|--|--|

STAGE



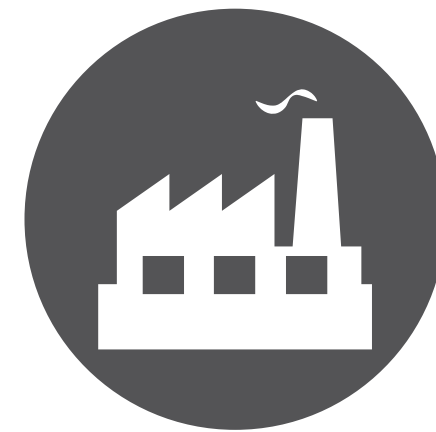
RAW MATERIALS

Extracting, Farming and Harvesting



YARN PRODUCTION

Spinning



FABRIC MANUFACTURING

Weaving, Bleaching, and Dyeing



CONSUMER USE

Washing, Drying, and Ironing



DISPOSAL

End-of-life

| | | | | | |
|-----------------------|--|--|--|--|--|
| <p>NEGATIVE -</p> | | | | | |
|-----------------------|--|--|--|--|--|

**SUSTAINABILITY IN FIBRES EXERCISE 1:
REVIEWING THE ENVIRONMENTAL IMPACT OF FIBRES**

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UNDERSTANDING FIBRES THROUGH THE CONSUMER USE STAGE

Questions to discuss:

- Why is dry cleaning harmful to the environment?
- What is the garment description (type of garment, colour etc.)?
- What is the fibre content listed on the care label?
- Why does this item need dry cleaning in relation to the components such as interlining, trims (if any were used) and garment construction?
- What are alternative laundering methods to dry cleaning? You can explore the Love Your Clothes website, a platform developed by industry organisations to help change the way the consumers buy, use and dispose of their clothing. The website has a section on “Care and Repair”, providing care instructions for different types of fibres.

CONSUMER INFLUENCE ON WARDROBE LONGEVITY

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| What is the garment description (type of garment, colour, etc.) | | | | | |
| What fibre type/s are in the garment? (e.g. cotton) | | | | | |
| What is the type of textile? (e.g. denim) | | | | | |
| What is the fabric construction? (e.g. twill) | | | | | |
| What is it about this garment that makes you wear it so often? | | | | | |
| Looking forward, what could be possible reasons for the disposal of this item? What and where are the areas of wear-and-tear, stains, and/or misshapenness?) | | | | | |

SUSTAINABILITY IN FIBRES PROJECT BRIEF 3:
CONSUMER INFLUENCE ON WARDROBE LONGEVITY

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