Materialval/ tillbehör

9 november 2020

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Viktig egenskap/-er map lång livslängd

Exempel - 

Rivkraft, nötning, vattenavvisning

Exempel - 

Tvätt/tork, elasticitet, komfort

Kravspecifikationer

- För att bestämma vilka egenskaper produkten ska ha.
- För att leverantören ska ha något att arbeta utifrån/en specifikation över vad som ska tillverkas.
- För att veta att du får det du beställer och att det levereras på rätt sätt.
- För att kunna visa på att materialet uppfyller/inte uppfyller kraven vid en tvist.
- För att veta vad du ska beställa nästa gång, exempelvis när en ny leverantör ska utvärderas.

Vanliga miljö- och humanekologiska certifieringar

- STANDARD 100 by OEKO-TEX®
- STeP by OEKO-TEX®
- MADE IN GREEN by OEKO-TEX®
- Svanen
- EU-Ecolabel
- KRAV
- GOTS
- Bra Miljöval
- bluesign®
- Better Cotton Initiative

OEKO-TEX®
CONFIDENCE IN TEXTILES
STANDARD 100
00000000 Institute
Tested for harmful substances.
www.oeko-tex.com/standard100

ENVIRONMENTAL PERFORMANCE
HEALTH & SAFETY
SOCIAL RESPONSIBILITY
ENVIRONMENTAL MANAGEMENT
QUALITY MANAGEMENT
CHEMICAL MANAGEMENT

BCI Better Cotton Initiative™

OEKO-TEX®
CONFIDENCE IN TEXTILES
MADE IN GREEN

KRAV

MILJÖMÄRKT

g 95 – 100%
anic fibres:

Using 70 – 94%
organic fibres:

bluesign®

EU Ecolabel
www.ecolabel.eu

GLOBAL ORGANIC TEXTILE STANDARD · GOTS ·
Organic
certified by *[certifier's ref.]*
Licence no 1234

GLOBAL ORGANIC TEXTILE STANDARD · GOTS ·
Made with (x %)
organic materials
certified by *[certifier's ref.]*
Licence no 4321

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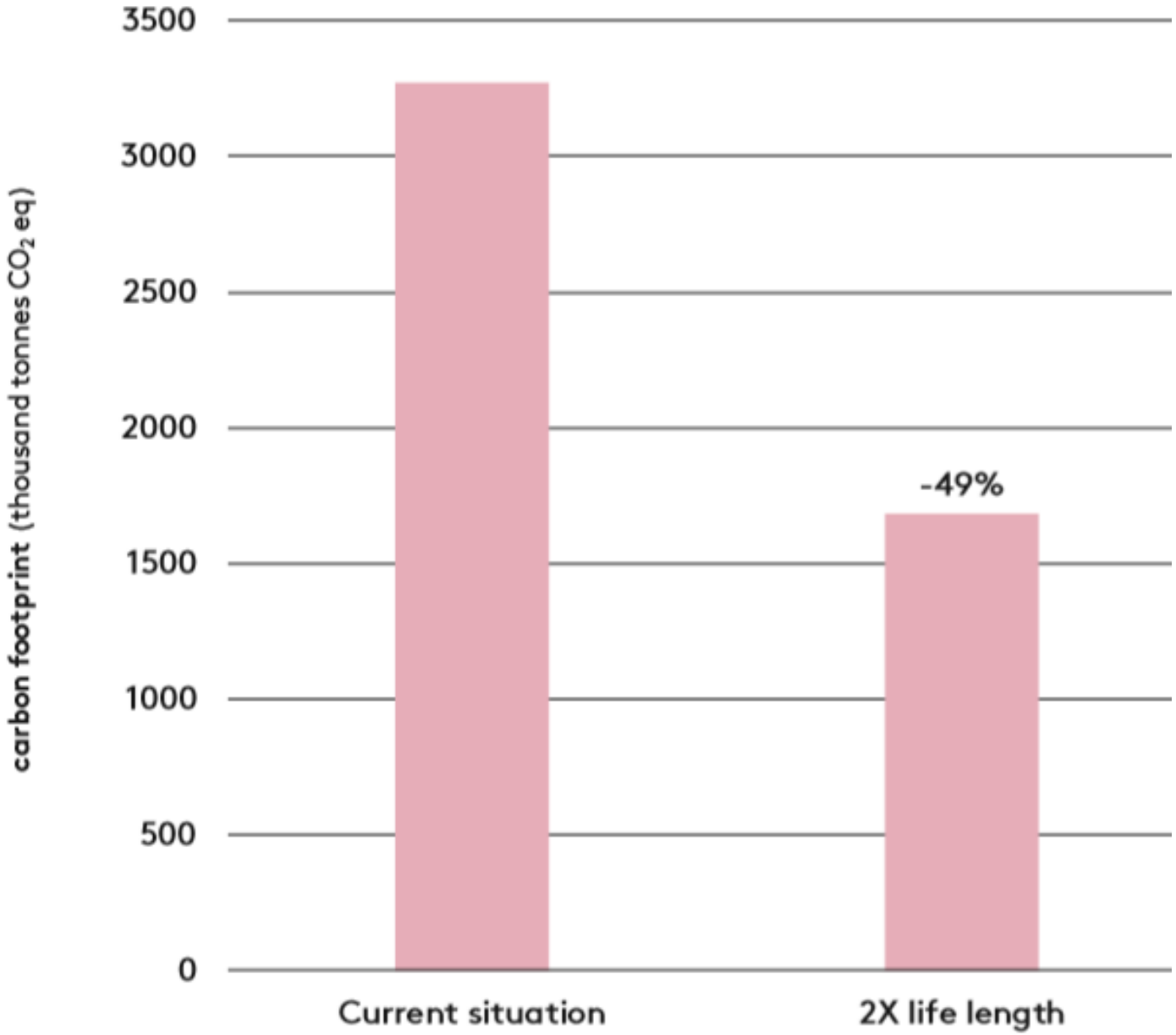
Exempel - polycotton vs 100% bomull

- 100 stycken fler tvättar
- Upp till 30% mindre energiåtgång
- Mindre tvättmedel

Sammanfattningsvis

- Fundera på vilken/-a egenskaper som är viktigast
- Bygg in i kravspecifikationerna
- Testa även efter åldring
- Mest fördelaktigt är det om textilien används så länge som möjligt i sin första cykel


3500
3000
2500
2000
1500
1000
500
0
carbon footprint (thousand tonnes CO_2 eq)
-49%
Current situation
2X life length

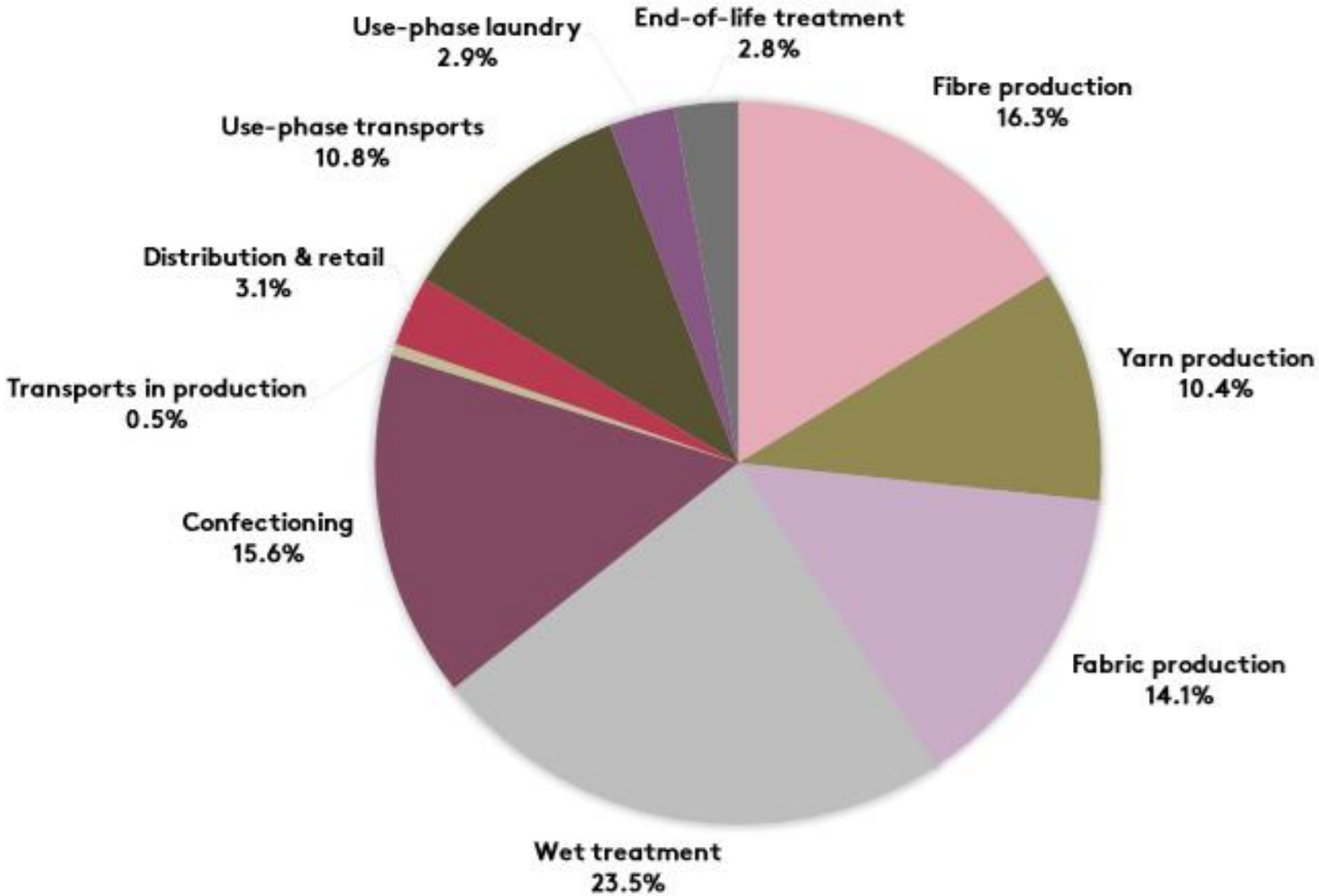


figure 2: Climate impact of Swedish clothing consumption, contribution of life-cycle phases. Figure from Sandin et al. (2019).

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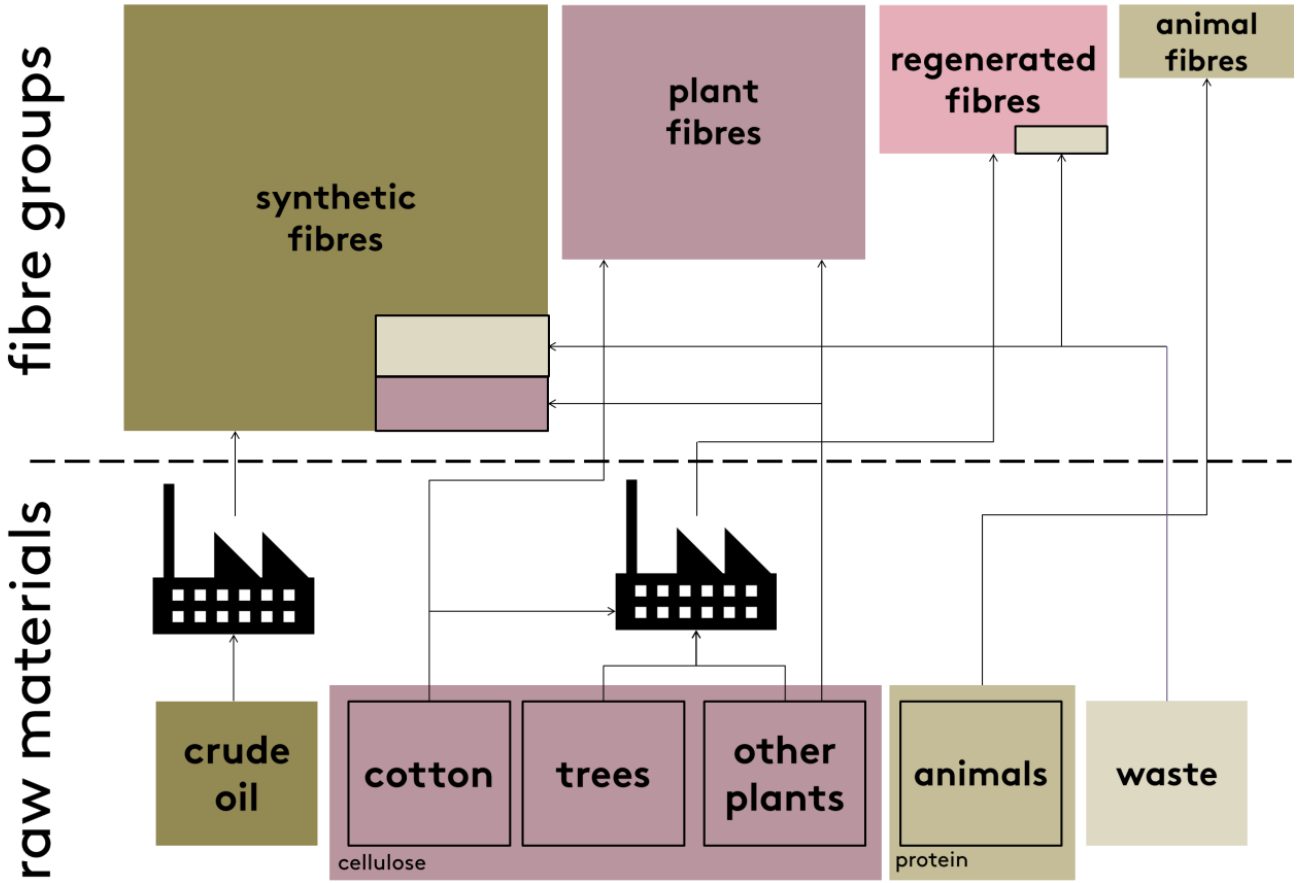
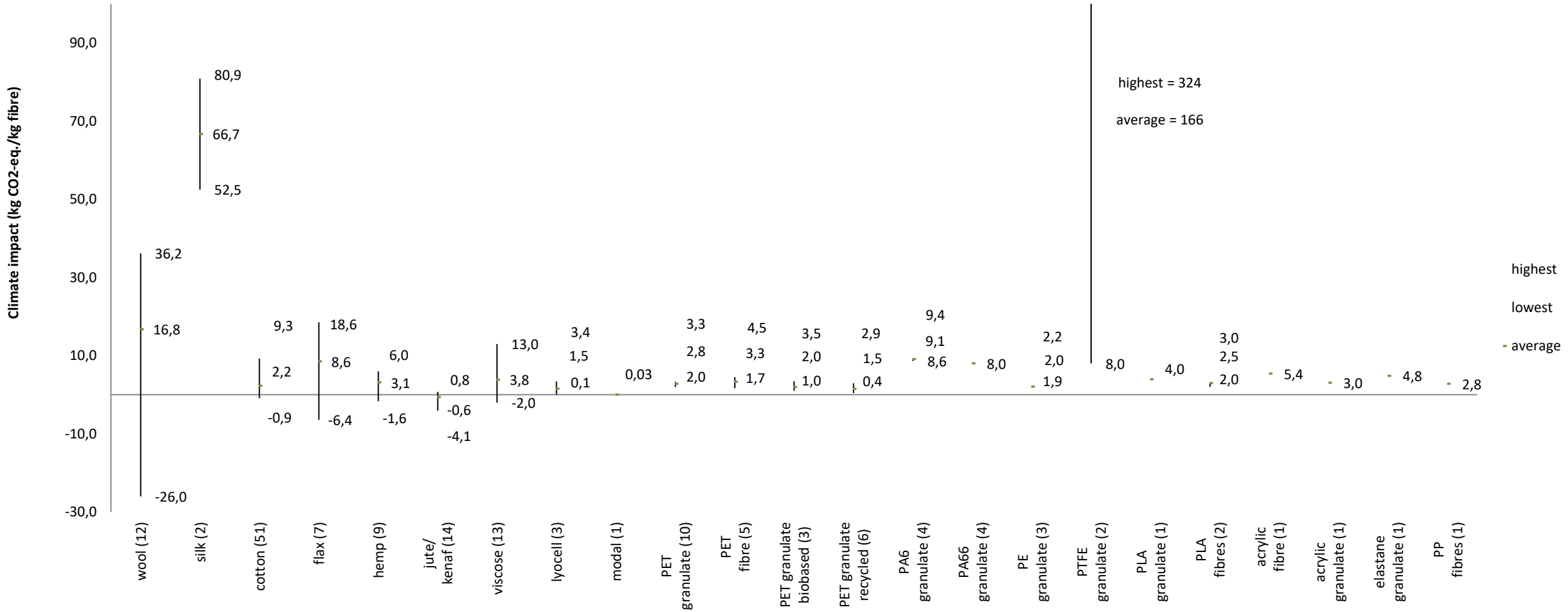
Fibres = fat, sugar and proteins!!!

supply 2

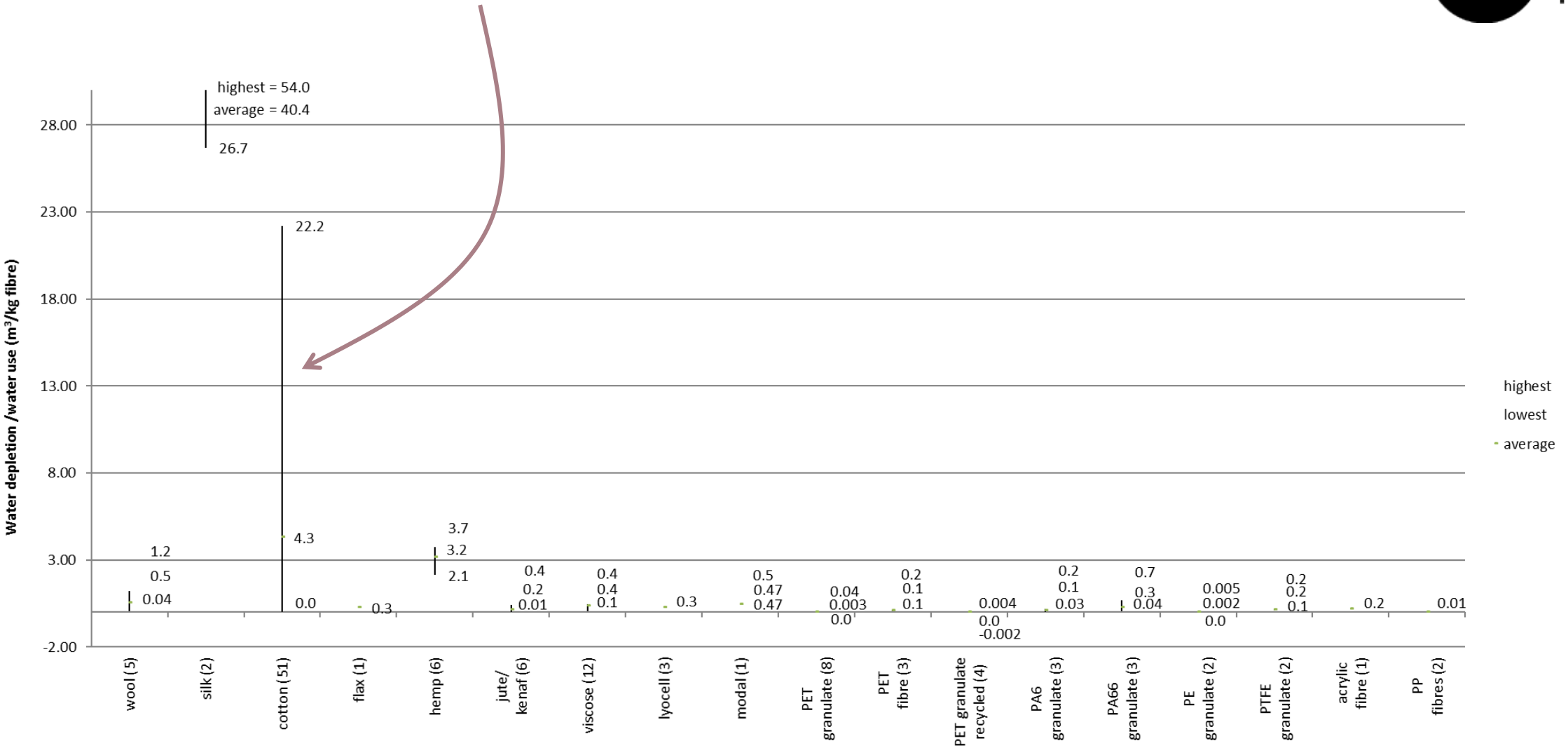


http://mistrafuturefashion.com/shifting-the-focus-from-fiber-to-process/

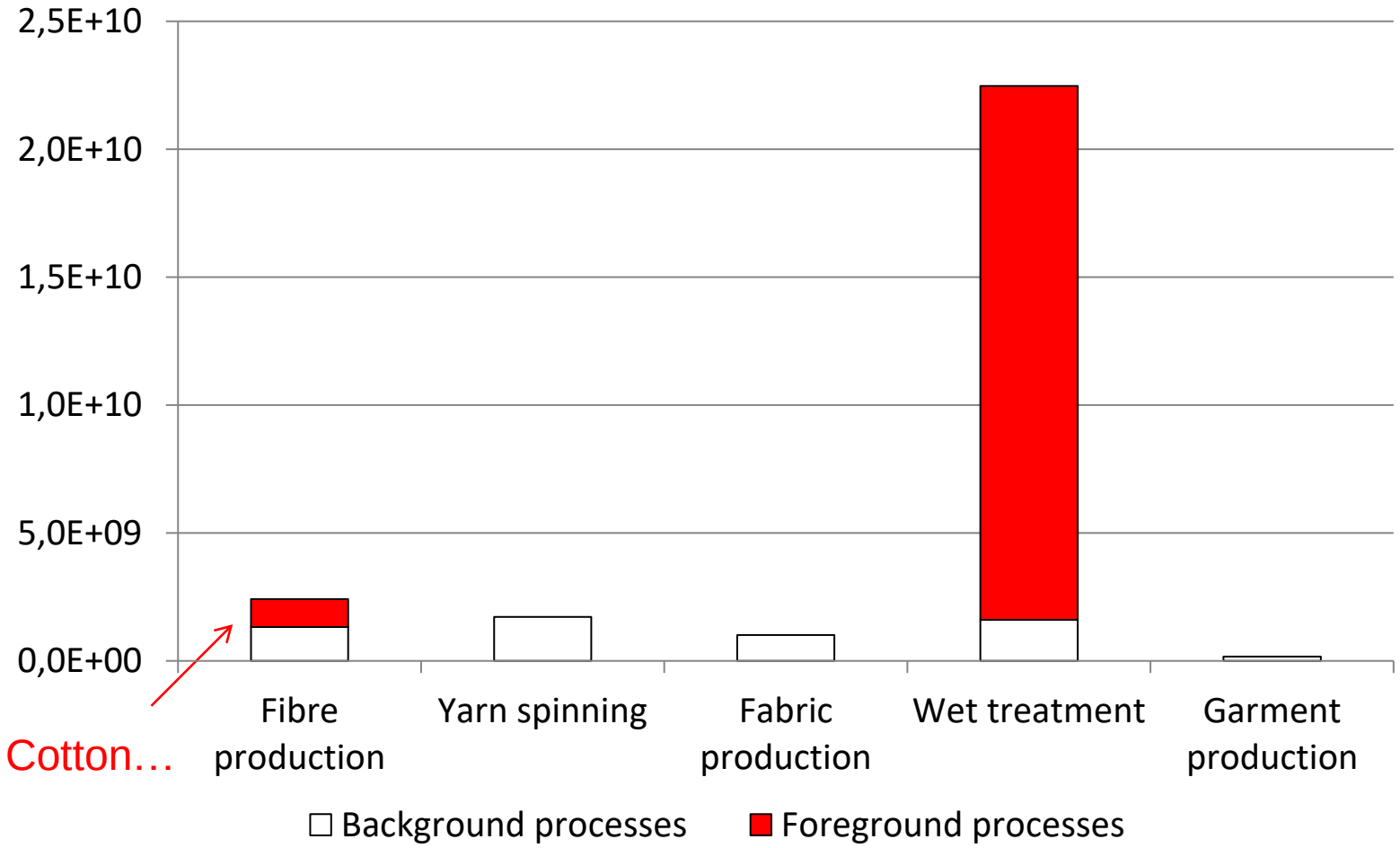
Conclusion from scientific facts:
There are no ”sustainable” or ”unsustainable” fibres!
It is the suppliers that differ!



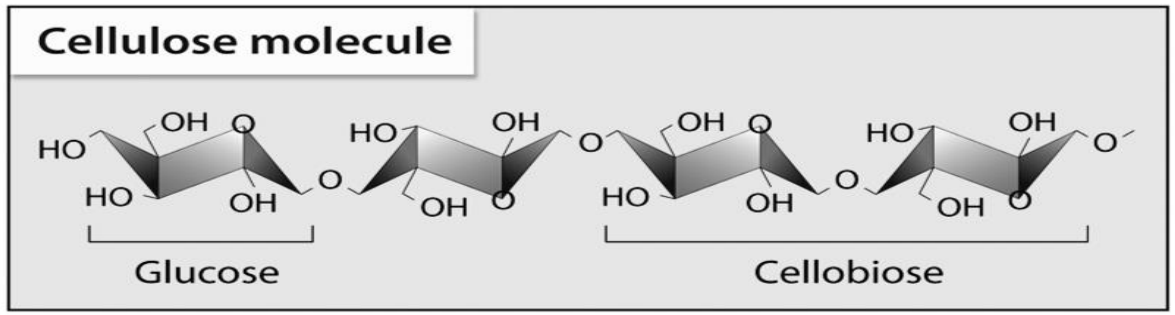
With one exception? In the future, what will conventional cotton cultivation look like?



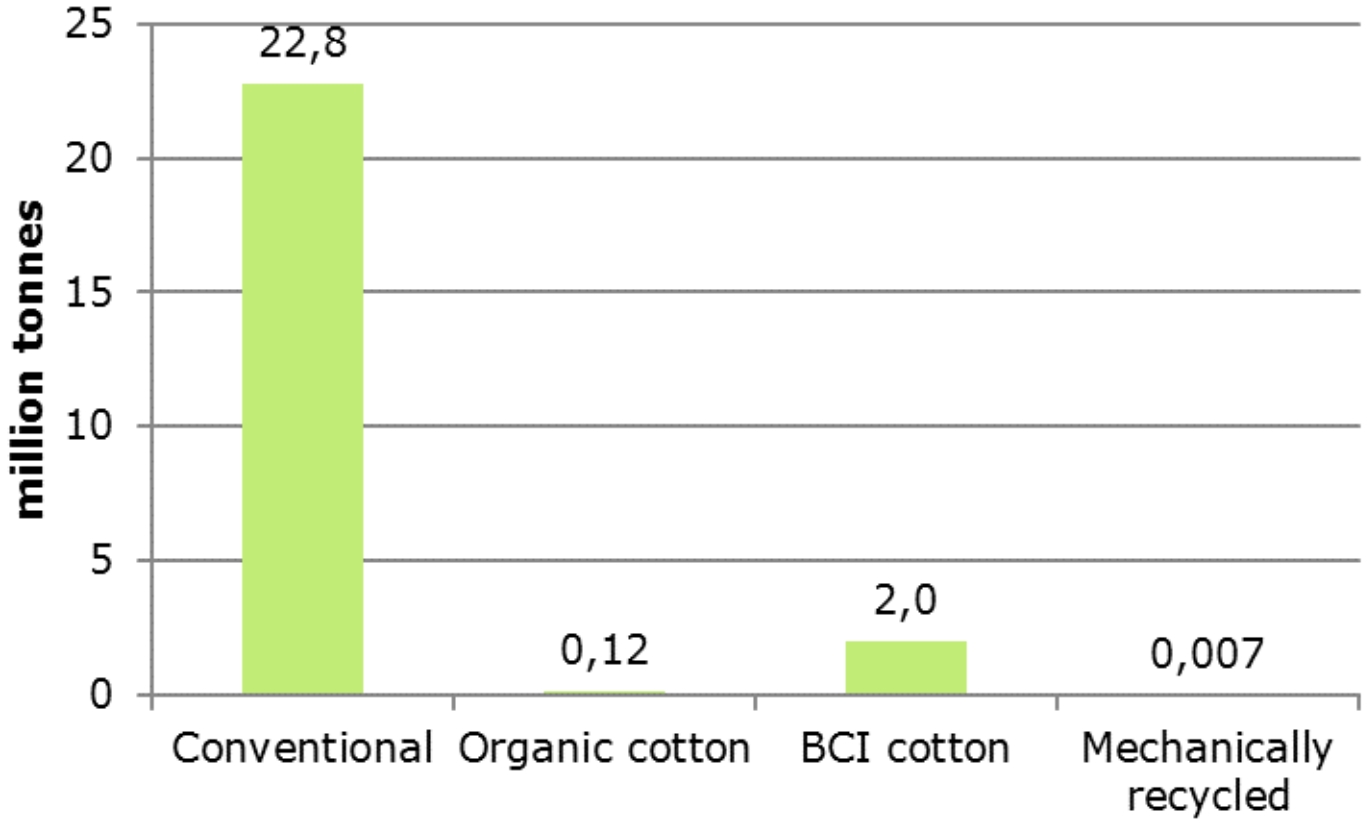
Freshwater ecotoxicity impacts from the Swedish apparel sector over one year (cradle to gate)



Cotton and wood consist of cellulose (sugar)



Organic / BCI / recycled cotton



Annual production volume of cotton fibres. Data from conventional cotton fibres from 2016 (The Fiber Year 2017), data for organic and BCI from 2013/2014 (PAN UK 2016).

Global status for GMO cotton (genetically modified cotton)

- GMO crops are farmed on a total of approx 180 million hectares *(over 10% of the world's arable land*)
- Approx 24 million hectares (Mha) GMO cotton farming world wide
- 24 MHa represents 75% of the total world production of cotton.
- In total 15 countries farm GMO cotton

Geography	**GM-cotton in ha · 2016**	**GMO-proportion in % · 2016**
India(since2002)	10.800.000	96
USA (since1997)	3.700.000	93
Pakistan(since2010)	2.900.000	97
China(since1997)	2.780.000	95

- https://royalsociety.org/topics-policy/projects/gm-plants/what-gm-crops-are-currently-being-grown-and-where/ (2015)
- *Certified organic cotton is grown on 350.000 hectares worldwide (2015), ~ 1 % market share*

Only two major processes exist to make man-made cellulose fibres from wood

Viscose

LENZING Viscose®

Birla Cellulose
Fibres From Nature

LENZING Modal®

Lyocell

TENCEL®

Rex, Okcabol, Roos: “Possible sustainable fibres on the market and their technical properties”

Sandin, Roos and Johansson: “Environmental impact of textile fibres – what we know and what we don’t know”

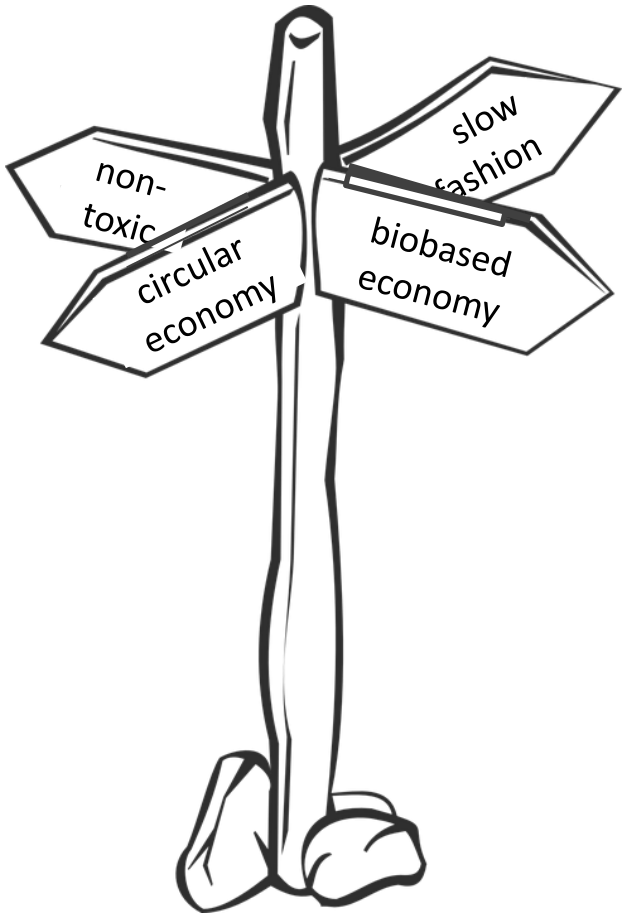
supply 2

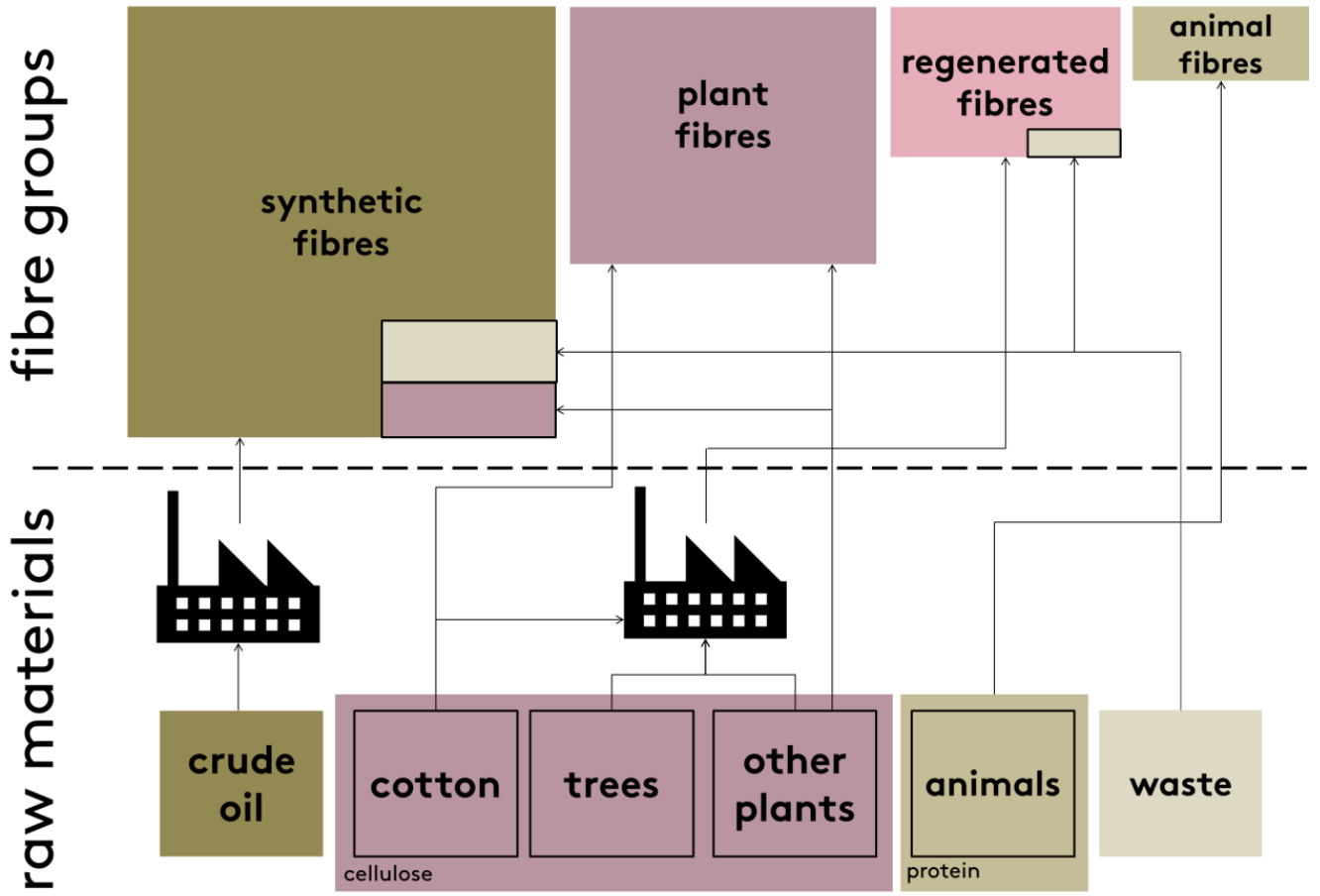
Materials/Name	Type of fibre	Raw material source(s)
Acrylic	Acrylonitrilic	Petroleum
Repreve® nylon	Polyamide	Post-industrial PA waste
rPET	Polyester	Generic name for recycled polyester
Polylana®	Polyester	Petroleum
Bamboo (linen)	Bast fibre	Bamboo
Hemp	Bast fibre	Hemp
Recover	Cotton and polyester blend	Mechanically recycled cotton waste (50% and recycled polyester (50%)
EVO	Polyamide	Castor oil
S.cafe®	Polyamide	Coffee grounds (2%) and petroleum
Nylon	Polyamide	Petroleum (bio-based/recycled)
Econyl®	Polyamide	Post-consumer and post-industrial polyamide (50/50)
Mipan Regen	Polyamide	Post-industrial PA waste
Nilit® EcoCare	Polyamide	Post-industrial PA waste
Q-Nova®	Polyamide	Post-industrial PA waste
Sorona®	Polyester	Corn (32%) and petroleum
Ingeo	Polyester	PLA from corn
Regen®	Polyester	Post consumer PET waste
Eco Circle Fiber	Polyester	Post-consumer PET waste
ECOPET	Polyester	Post-consumer PET waste
Repreve®	Polyester	Post-consumer PET waste
Elastane (Lycra®)	Polyurethane	Petroleum
Lycra® (elastane)	Polyurethane	Petroleum
Alpaca	Protein	Alpaca
Silk	Protein	Mulberry silk worms and other insects
Recycled wool	Protein	Post-industrial waste wool (post-consumer waste)

Materials/Name	Type of fibre	Raw material source(s)
Bamboo (viscose)	Regenerated cellulose fibre	Bamboo
Monocel®	Regenerated cellulose fibre	Bamboo
Orange Fiber	Regenerated cellulose fibre	Citrus peel
Tencel®	Regenerated cellulose fibre	Eucalyptus and other wood types
Evrnu	Regenerated cellulose fibre	Post-consumer cotton waste (20%) and virgin cotton
Refibra®	Regenerated cellulose fibre	Post-industrial cotton (20%) and wood
Seacell®	Regenerated cellulose fibre	Seaweed (1%) and wood
Acetate	Regenerated cellulose fibre	Wood
Ioncell	Regenerated cellulose fibre	Wood
Triacetate	Regenerated cellulose fibre	Wood
Fortisan	Regenerated cellulose fibre	Wood and plants
Lyocell	Regenerated cellulose fibre	Wood and plants
Rayon (viscose)	Regenerated cellulose fibre	Wood and plants
Viscose (rayon)	Regenerated cellulose fibre	Wood and plants
CELSOL	Regenerated cellulose fibre	Wood and plants
Milk fibre	Regenerated protein fibre	Milk
Qmilch®	Regenerated protein fibre	Milk
Azlon	Regenerated protein fibre	Milk (casein), eggs (albumin), corn and soy (zein), chicken feathers (keratin), or leather and hide waste (collagen)
Soybean	Regenerated protein fibre	Soy beans

Which fibre to select?

supply 2

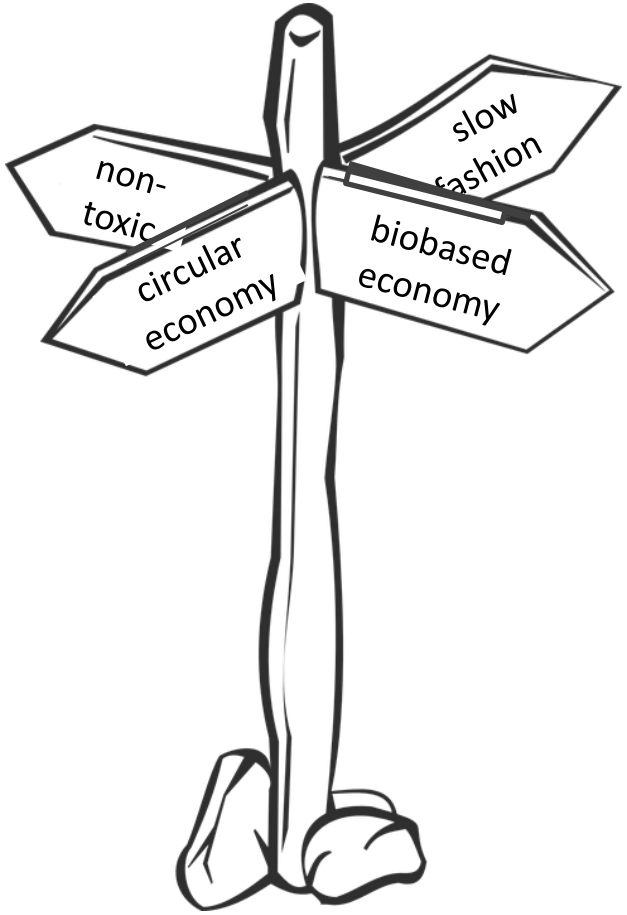


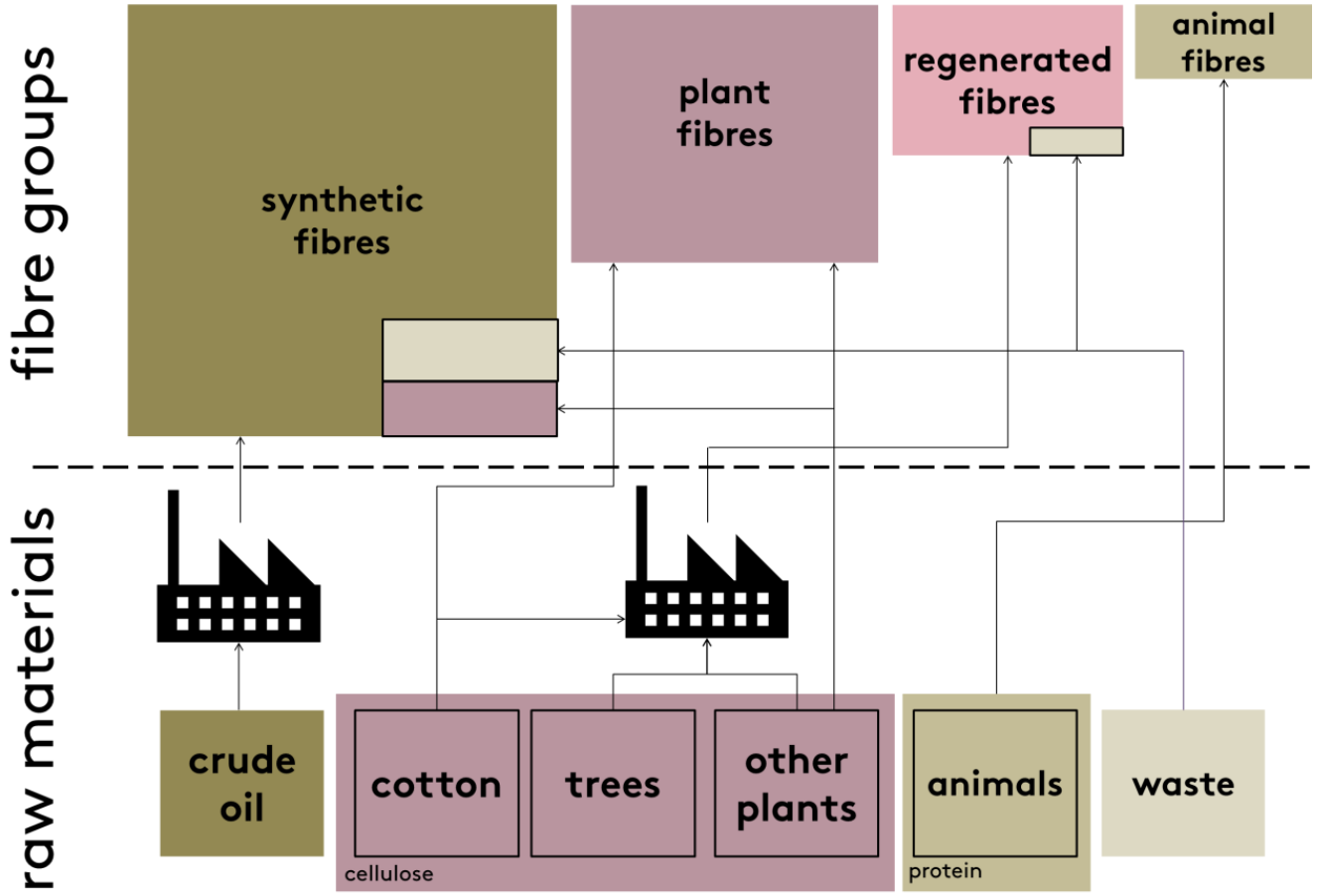


Biobased economy: ”skip the fossil ones” (but use also renewable fuels!)

Which fibre to select?

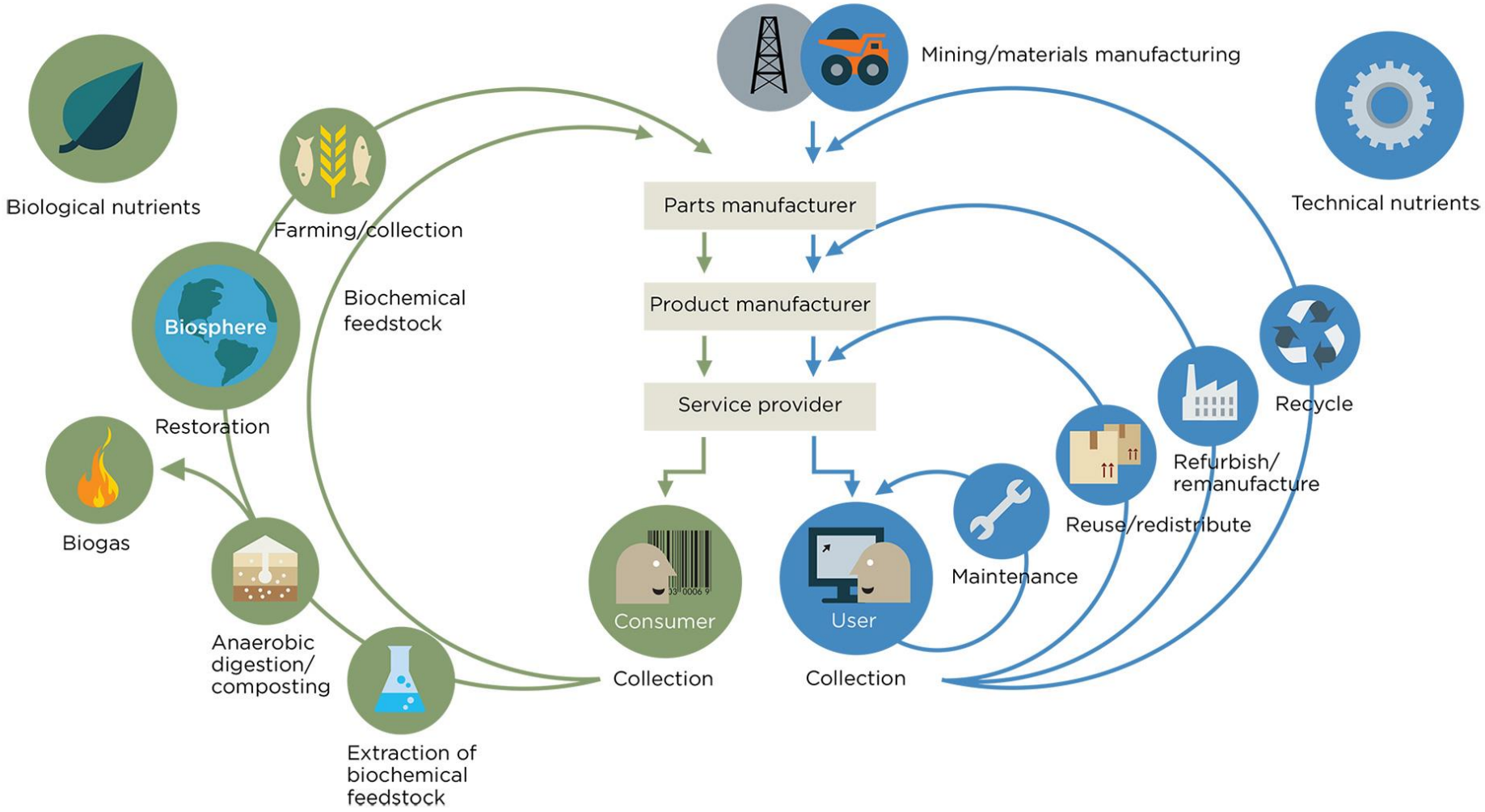
supply 2





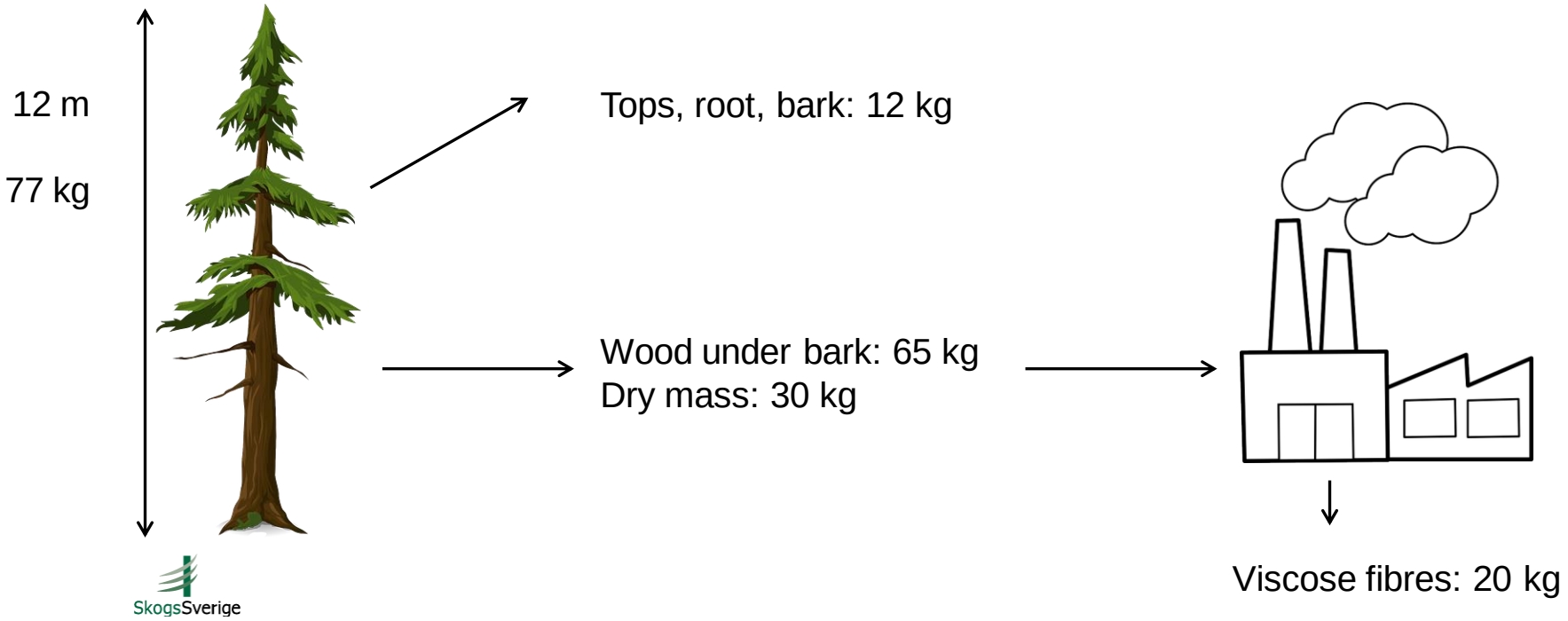
Slow fashion: ”use synthetics with long life span”

Circular economy in the fashion industry



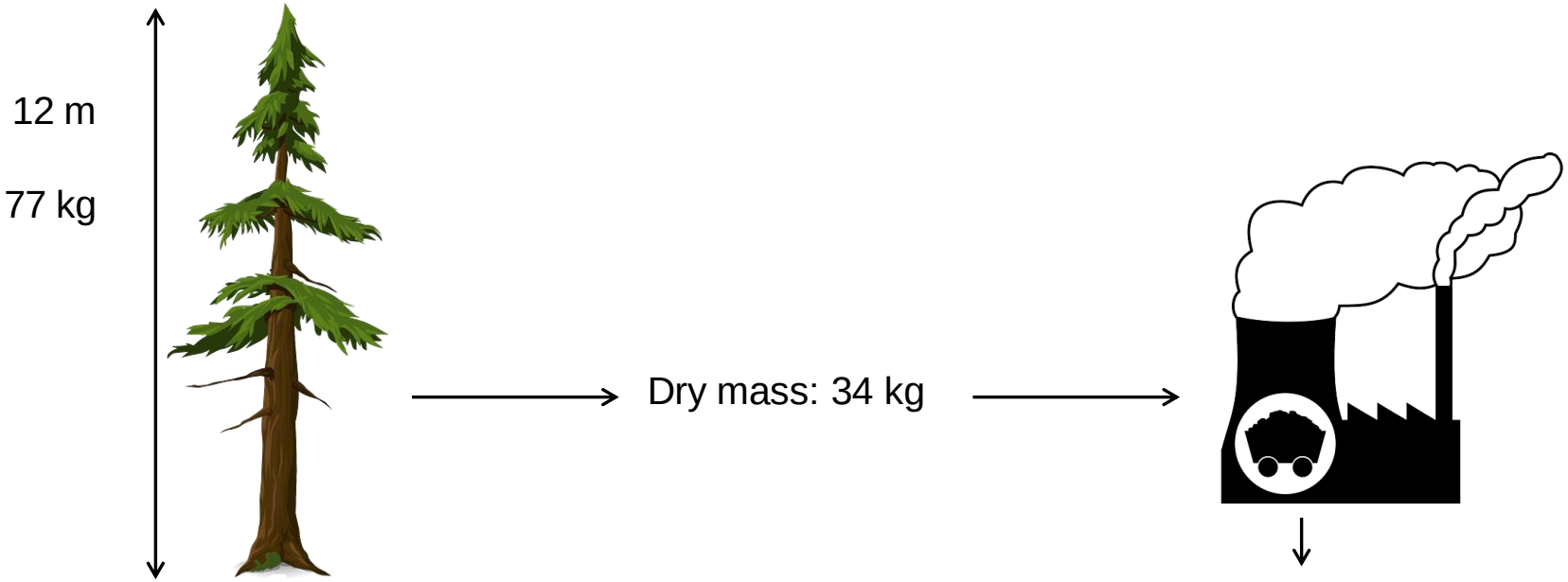
What do we mean with circular economy?

Example of resource use:
Wood to material - viscose fibres



mistra future fashion

Example of resource use:
Wood to energy: heat and electricity



Bauer C. (2007) **Holzenergie**. In: Sachbilanzen von Energiesystemen: Grundlagen für den ökologischen Vergleich von Energiesystemen und den Einbezug von Energiesystemen in Ökobilanzen für die Schweiz (ed. Dones R.). Swiss Centre for Life Cycle Inventories, Dübendorf, CH.

Material AND energy production from wood: 20 kg viscose fibres

+

+ ?

Material for 20 kg viscose fibres:
= 1 tree

Energy for 20 kg viscose fibres:
= 1.3 trees

(~200 MJ)

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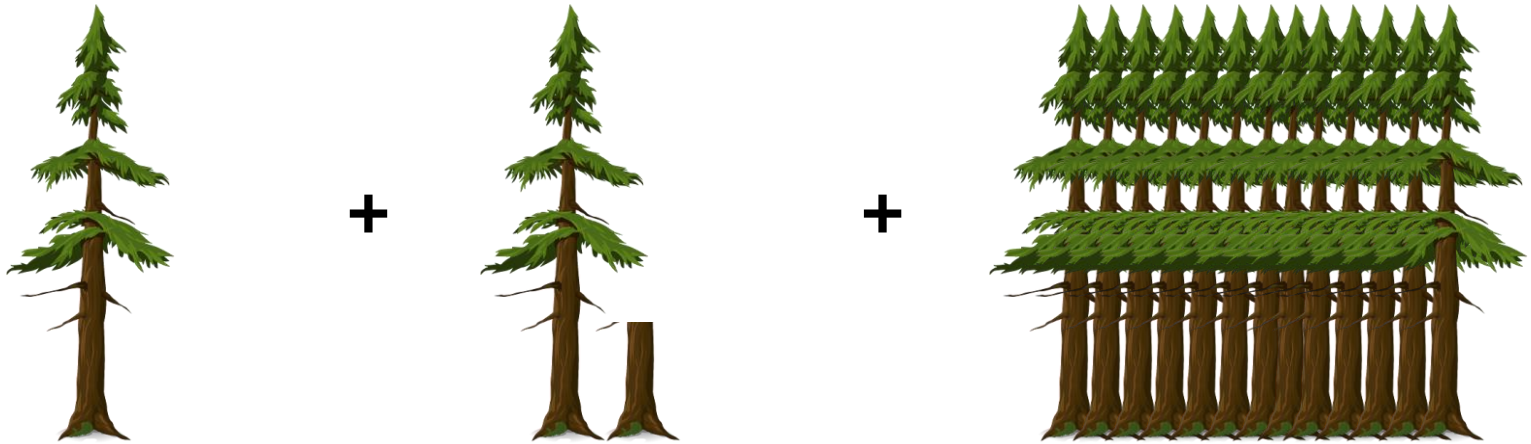
Material AND energy production from wood: 20 kg viscose fibres



Material for 20 kg viscose fibres:
= 1 tree

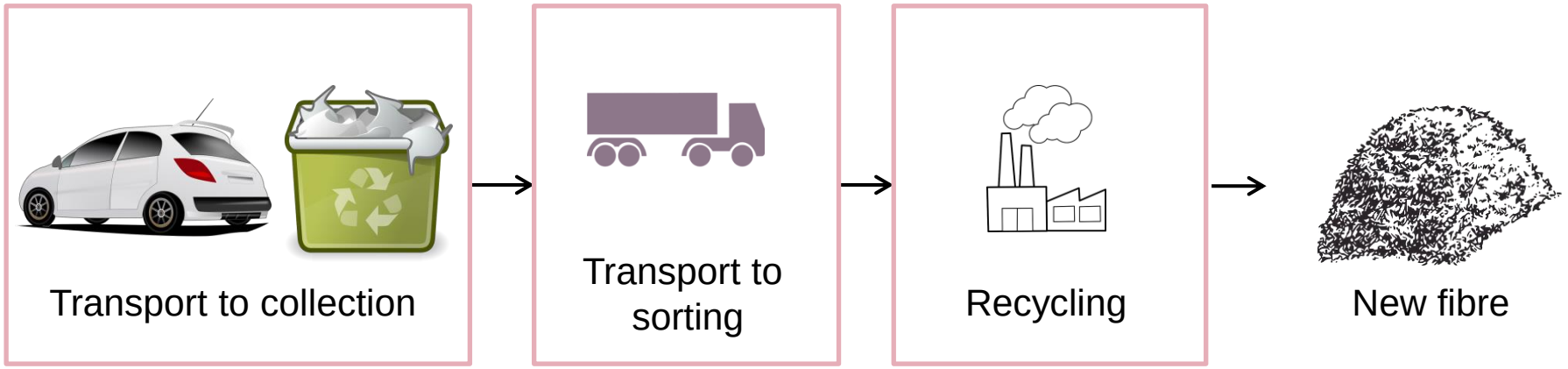
Energy for 20 kg viscose fibres:
= 1.3 trees

(~200 MJ)

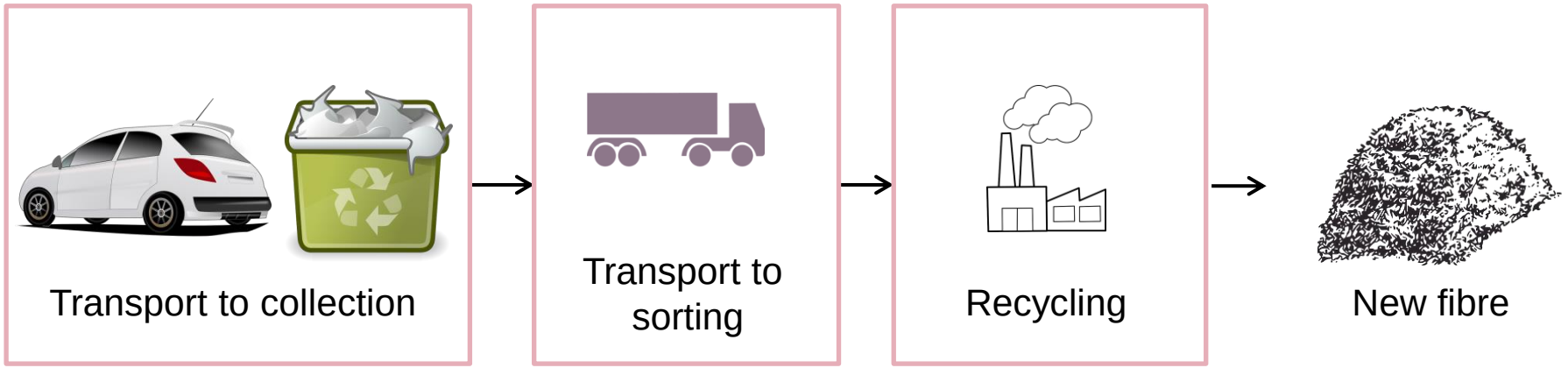
Energy for 15 kg viscose garments:
= 13 trees

(~3800 MJ)

Recycling – why is that good for the environment?

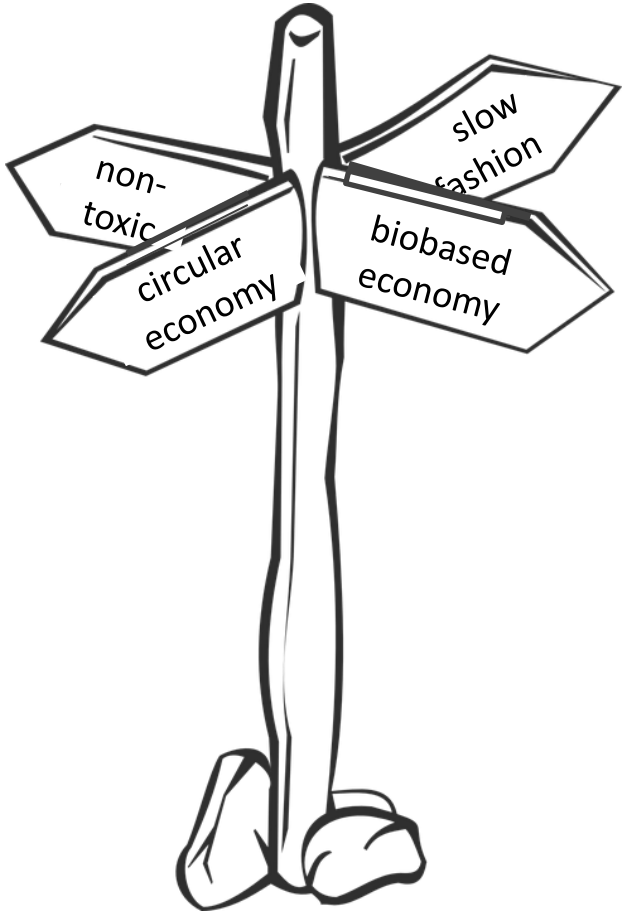


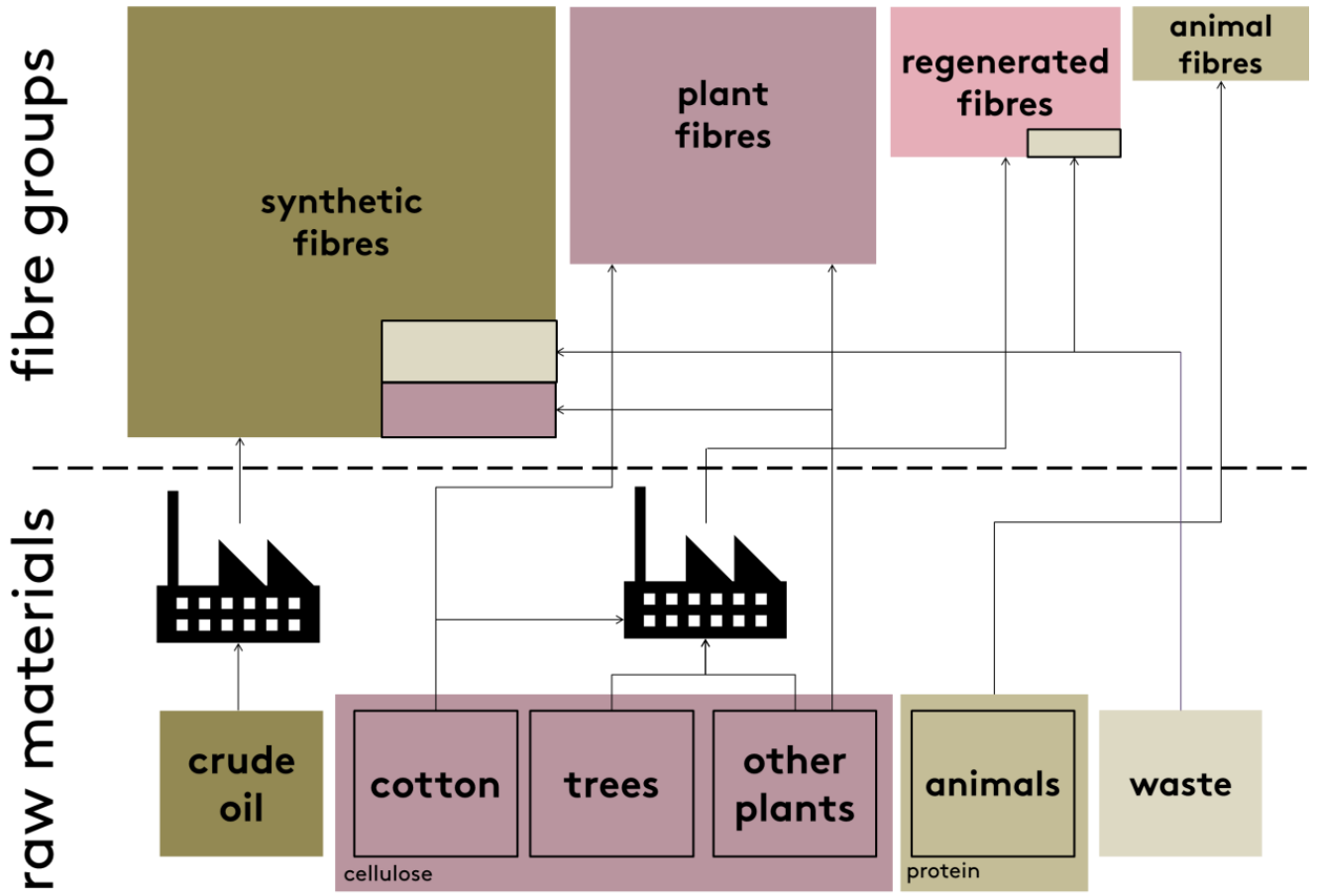
Recycling – environmental benefit is created when virgin resources are replaced (and the ”recycling” process route has less impact than the ”virgin” route)



Which fibre to select?

supply 2

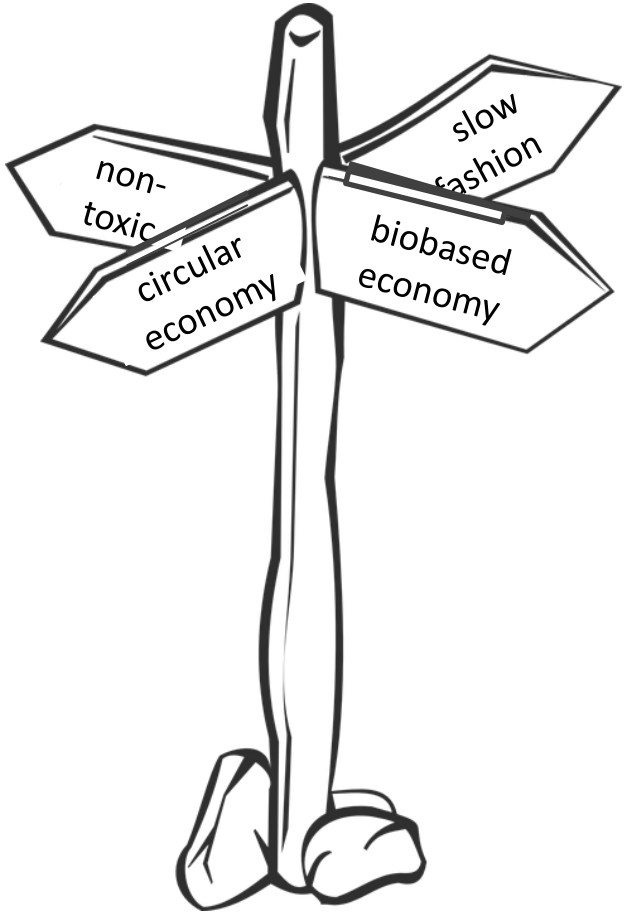


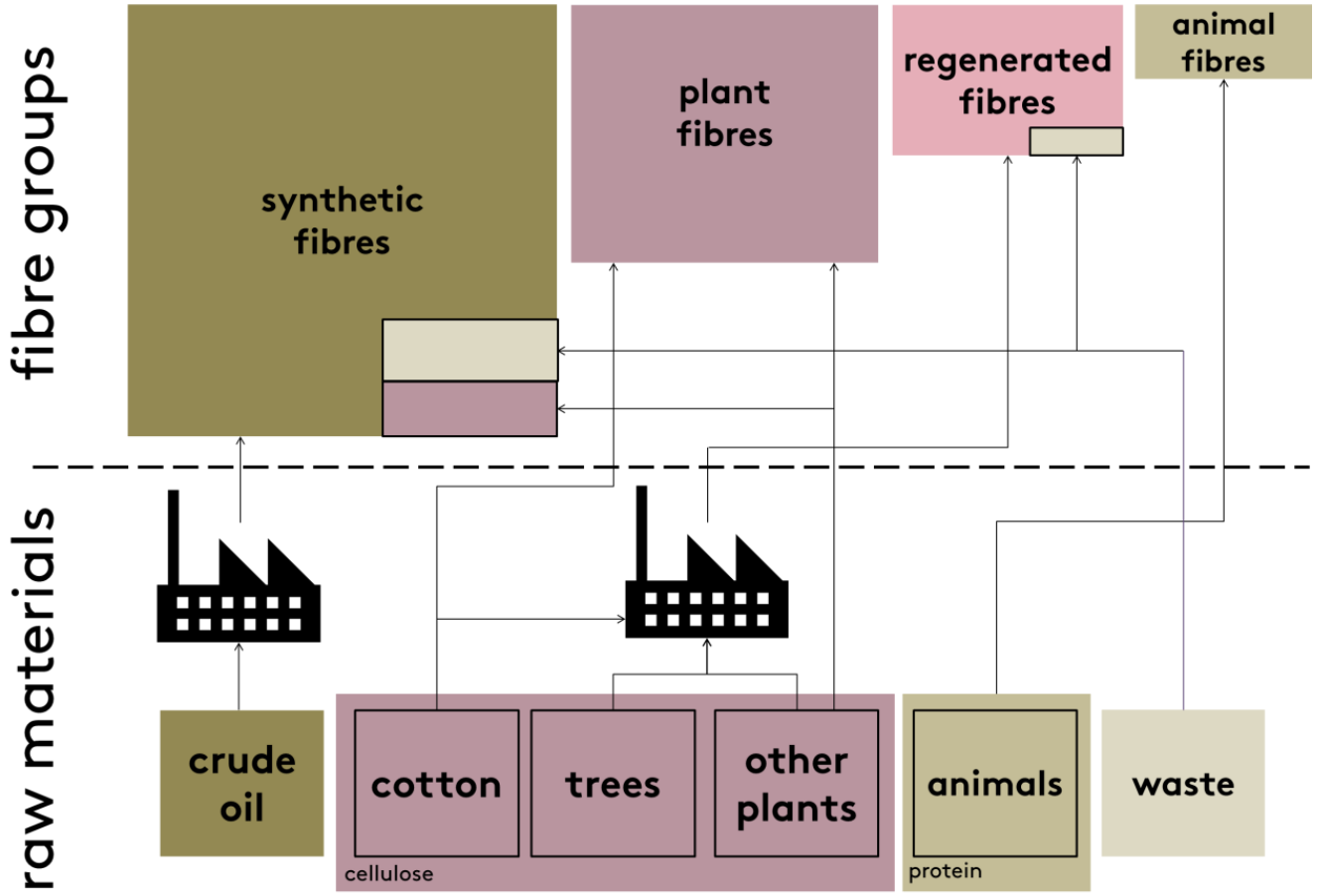


Non-toxic environment: ”skip the cotton”

Which fibre to select?

supply 2

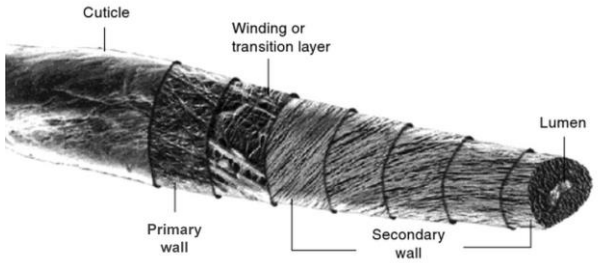




Circular economy: ”use recycled or bio-based”

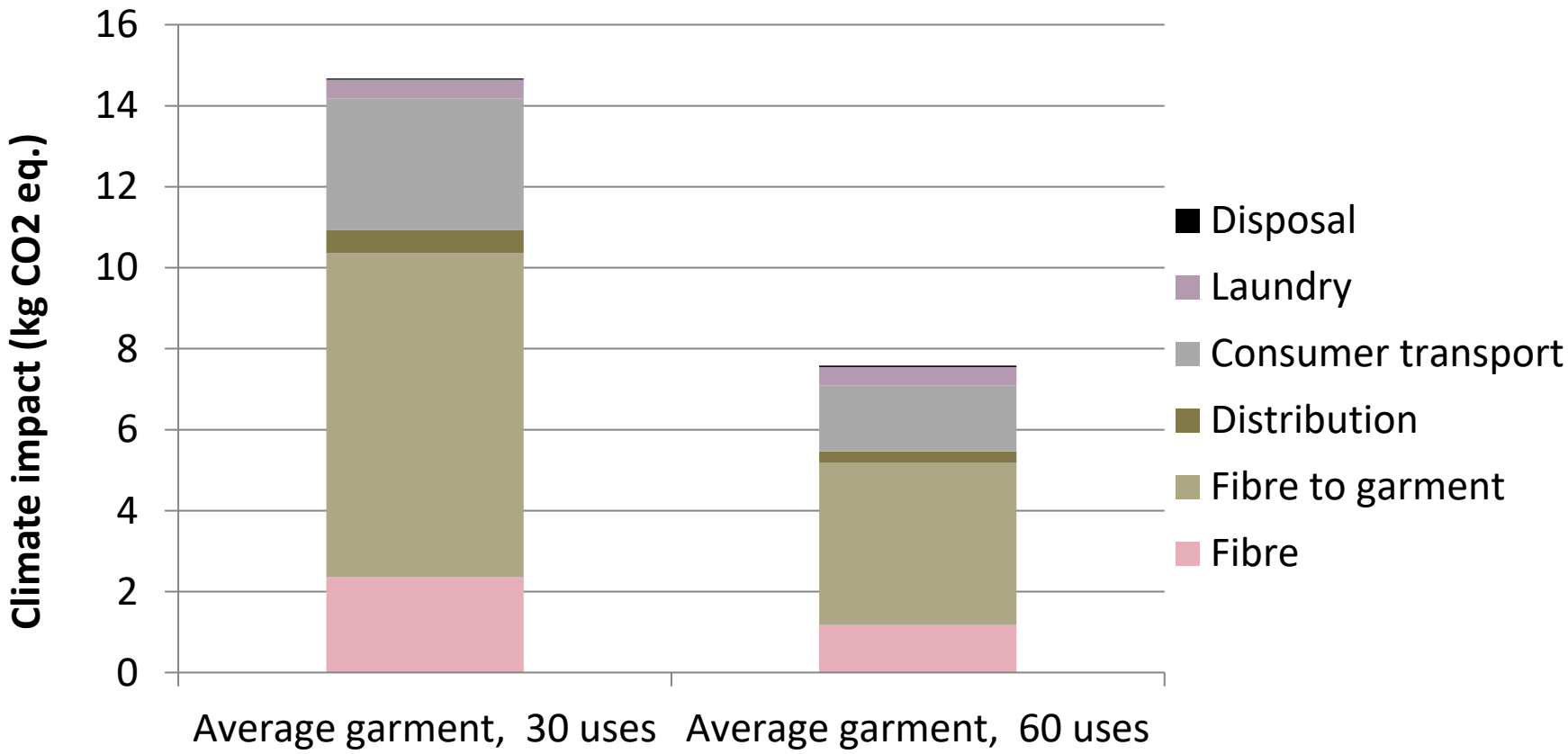
Differ between Market substitution vs. Technical substitution

supply 2



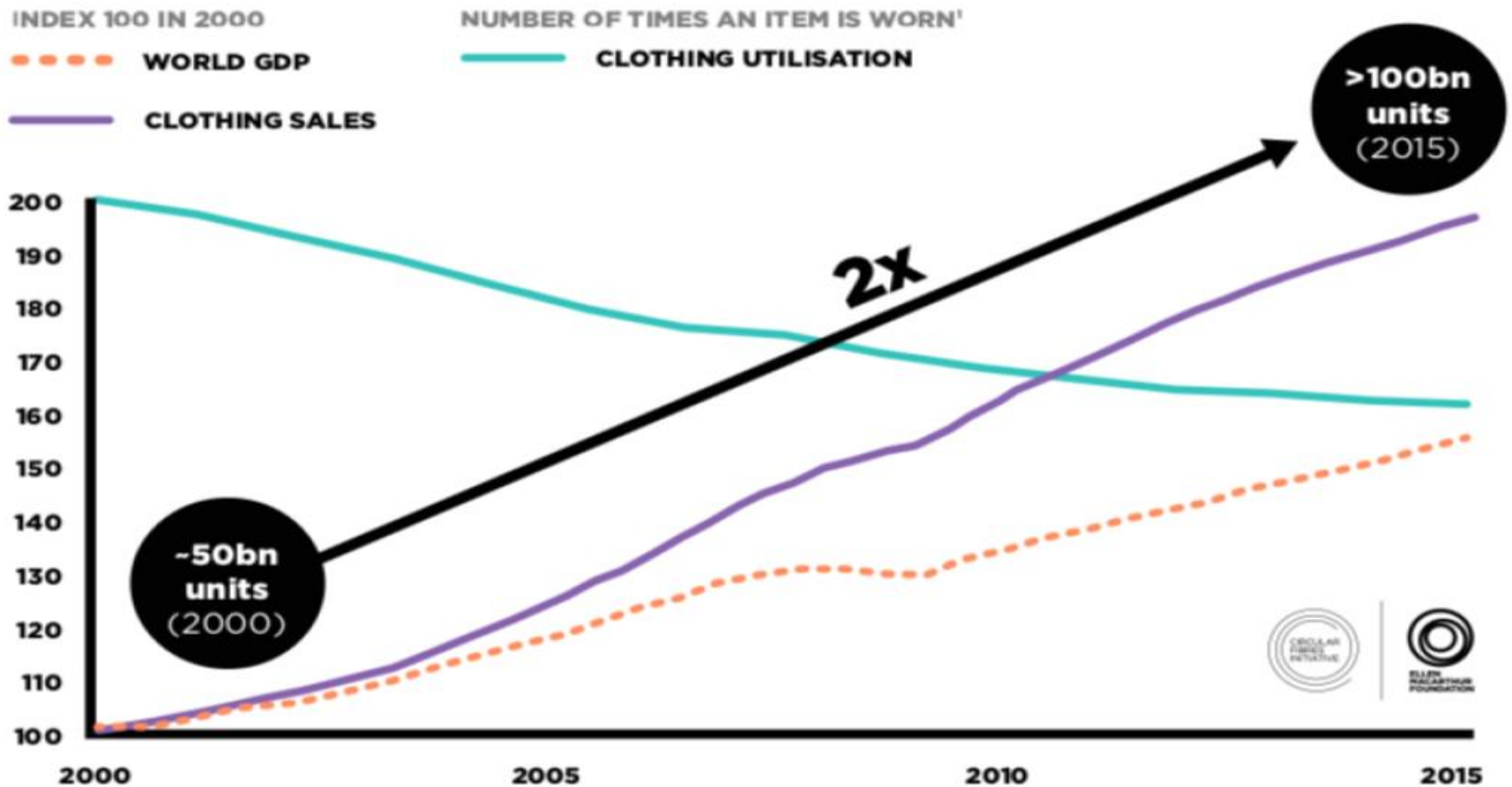
- Cotton
  - Only market substitution possible for the foreseeable future
  - There are LOTS of alternatives but look out for green-washing!
- Polyester
  - Technical substitution: bio-based or recycled ”drop-in” solutions have the same performance
  - Market substitution also an option

Most important recommendation: Optimise the life span!



Climate impact expressed as kg CO_2 equivalents and calculated for a hypothetical average garment of 0.5 kg. A doubled life length, from 30 uses of the garment (left) to 60 uses of the garment (right), decreases the climate impact by 48% - from 14.7 to 7.6 kg CO_2-eq. Modified from Roos et al. (2015).

FIGURE 1: GROWTH OF CLOTHING SALES AND DECLINE IN CLOTHING UTILISATION SINCE 2000



1 Average number of times a garment is worn before it ceases to be used

Source: Euromonitor International Apparel & Footwear 2016 Edition (volume sales trends 2005–2015); World Bank, *World development indicators – GD* (2017)