Circular Textile Business Models for Deadstock and Cutting Waste

Circular Economy in the clothing and textile chain

ECOMONDO

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TEXTILE WASTE is a major CHALLENGE FOR THE GLOBAL SUPPLY-CHAIN

RECYCLE WHERE WASTE IS GENERATED

➔ Save in transportation costs, lower CO2 emissions, new investments for local recycling capacity, create local employment opportunities, improve working conditions of the waste collectors informal sector

CLASSIFY, QUALIFY WASTE

➔ "not all waste is equal", proper segregation and classification increase waste economic value and enable recycling of diverse waste fraction into different applications and value chains

WHO IS THE OWNER OF THE WASTE MATERIAL?

➔ Legal issues, customs issues

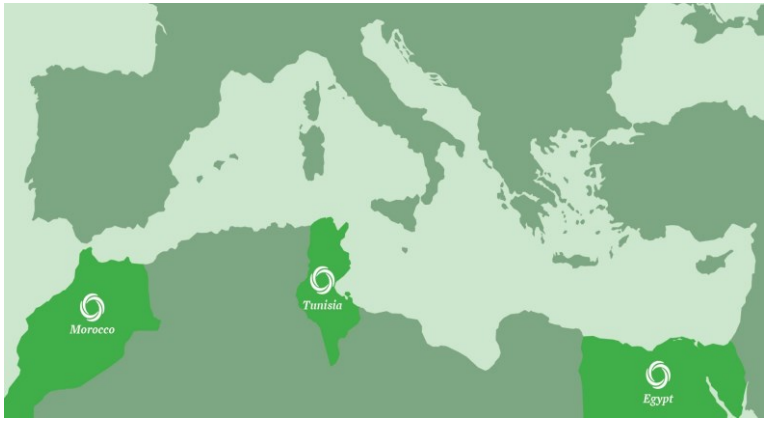
KEEP HAZARDOUS CHEMICALS OUT FROM RECYCLING

➔ Recycled & safe

ENSURE TRACEABILITY

➔ Certification, Information to the consumer

SwitchMed: Promoting Circular Value Chains in Textile Sector in the Southern Mediterranean Region



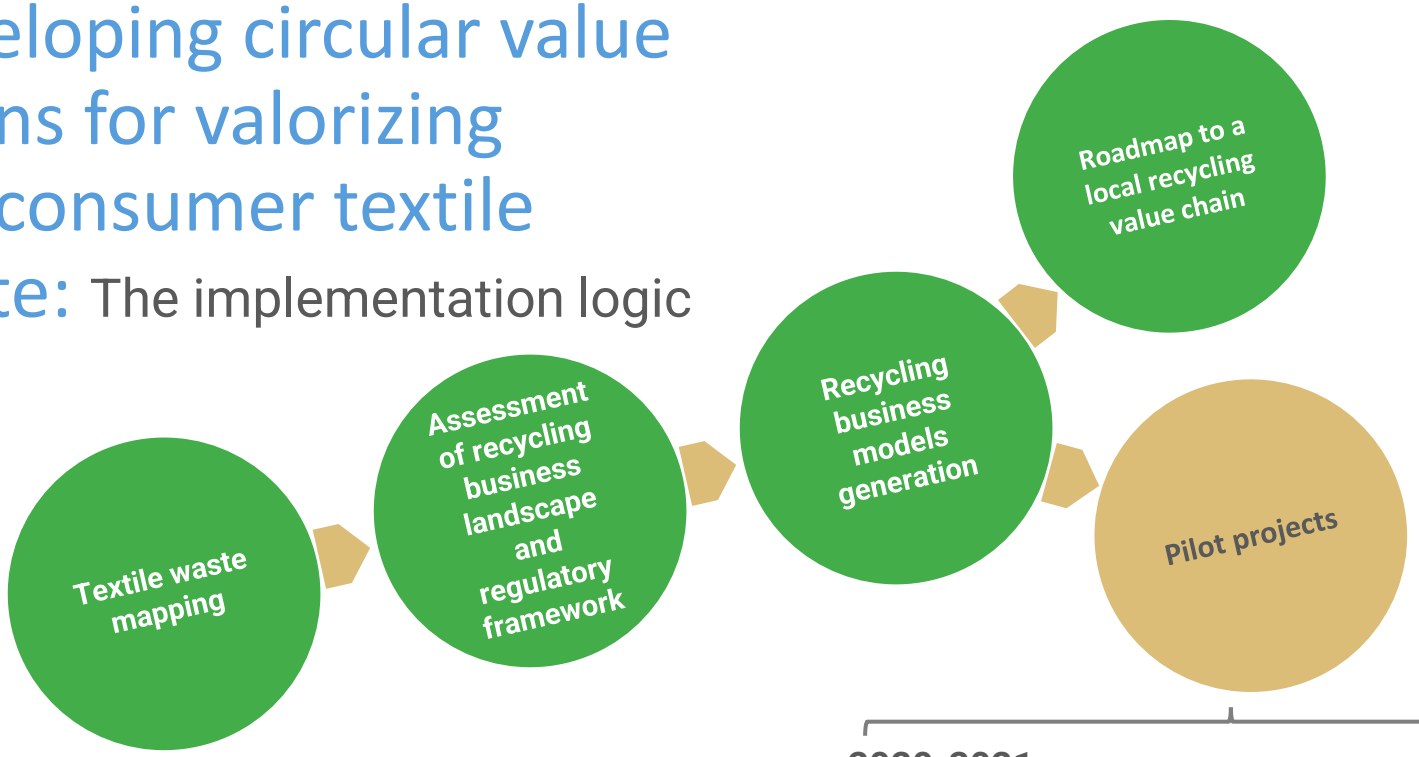
Two priority areas of intervention:

1. Developing national capacities for localizing value chains to valorise pre-consumer textile waste through proper classification, efficient collection, sorting, recycling and circular business models aligned to global market needs

2. Supporting the Industry to build responsible Chemical management in line with their needs and the requirements of the international Brands. – In partnership with

Ø ZDHC
Zero Discharge of Hazardous Chemicals

Developing circular value chains for valorizing pre-consumer textile waste: The implementation logic



2020-2021:
Closed loop recycling of 2nd quality jeans in new jeans in Tunisia

2021-2023:
Two pilots Morocco
Two pilots in Tunisia

2022-2023:
Two Pilots in Egypt

PVH

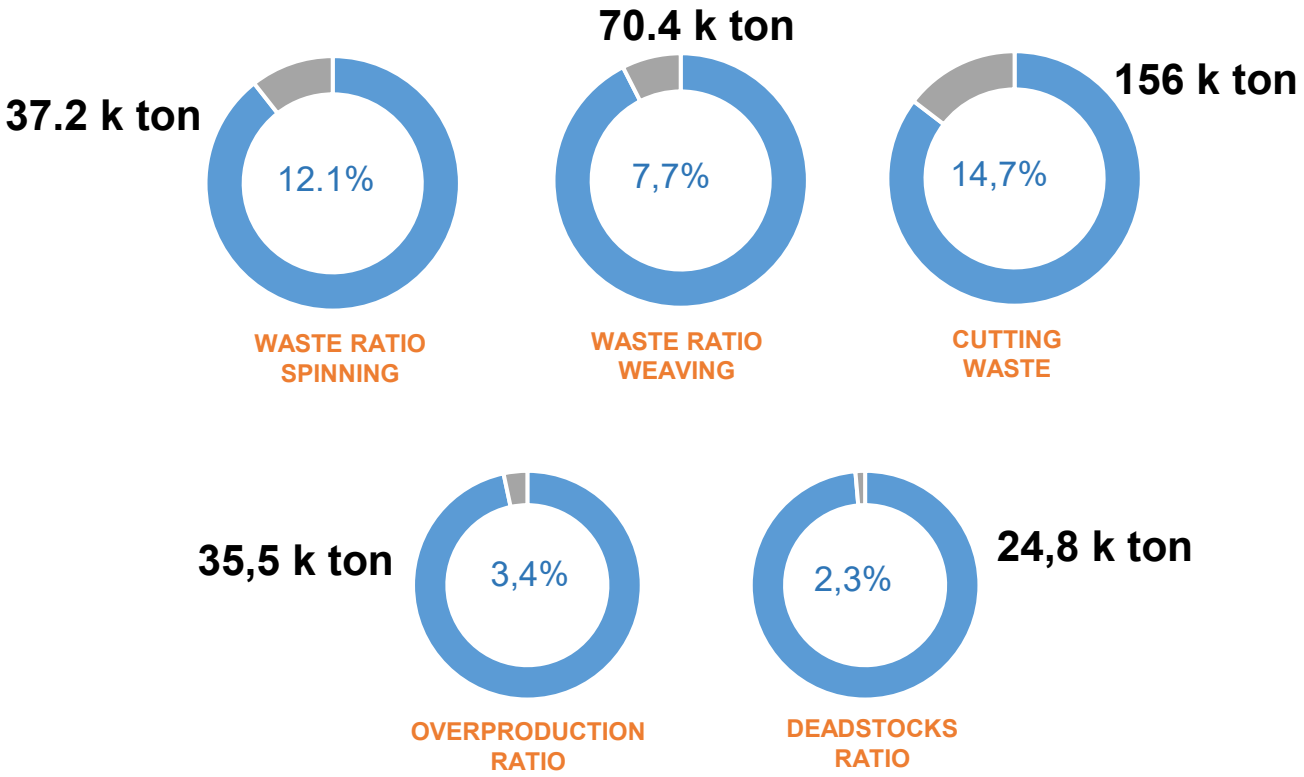
OTB

Nudie Jeans co

Results of the Waste mapping TUN/EGY/MOR

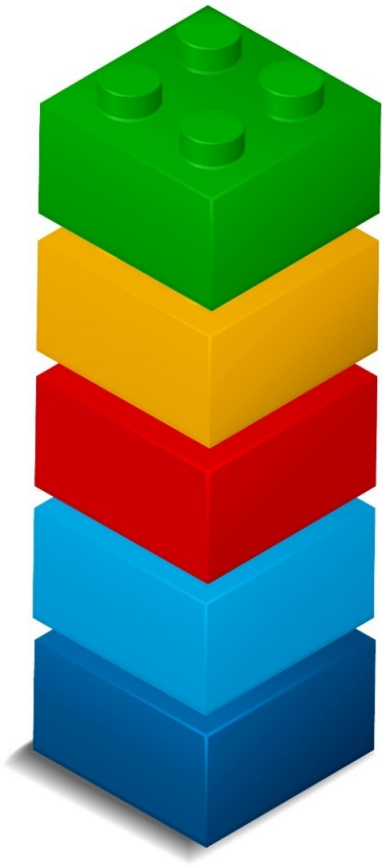
THE RATIO OF WASTE TO PROCESSED MATERIAL BY SECTOR

The fabric cutting and spinning processes have the highest waste rate. the type of fiber strongly influences the waste rate, which is lower for synthetic fibers than for cotton.



Building blocks for Circular Textile

(Textile Waste from **post industrial and pre-consumer**)



(5) Local textile waste recycling eco-system
Development of local recycling hubs in the textile regions,
and within the Special Economic Zones, connecting to global waste trading platforms

(4) Remanufacturing - Upcycling
Remanufacturing / upcycling from textile waste (mostly cutting waste)
or 2nd quality garments/deadstock to new textile/fashion items

(3) Fashion to Fashion recycling
Recycling fibers from 2nd quality or deadstock garments to new garments

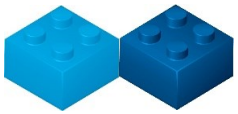
(2) Fiber to Fashion recycling
Recycling fibers from textile waste (mostly cutting waste) to new garments

(1) Fiber recycling industrial symbiosis
Recycling fibers from textile waste (mostly cutting waste) to other uses
(Furniture, Automotive, Building/Home insulation, Padding etc.)

See the next slide for a definition of recycling and upcycling

Combining building blocks for Circular Textile

(1) Fiber recycling industrial symbiosis + (2) Fiber to Fashion recycling



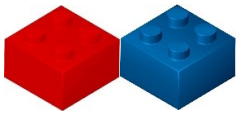
TEXTILE WASTE RECYCLING

Segregation of textile waste on the factory floor, particularly in the cutting rooms, can significantly impact the recyclability.

After segregation and proper classification:

- ✓ Top-quality textile waste can be recycled in fashion collections, including in brand's closed-loop projects .
- ✓ Low-quality waste must be managed properly and downcycled to non fashion or non textile end-users

(1) Fiber recycling industrial symbiosis + (3) Fashion to Fashion recycling



SECOND QUALITY GARMENTS RECYCLING

Overproduction and 2nd quality garments are an ongoing and growing problem.

Shredding and recycling can be a solution. It however implies the cost of disassembling and removing buttons, zippers, tags etc.

The shredded fiber can be sold or included in brand's closed-loop projects.

Low-quality waste must be managed properly and downcycled to non fashion or non textile end-users

(4) Remanufacturing / Upcycling

REMANUFACTURING / UPCYCLING

Textile scraps and 2nd quality garments can also be remanufactured and upcycled to create new items without the need for bringing them back to the fibre status.

Re-thinking and re-design are critical to maximise the opportunities for remanufacuring and upcycling.

(5) Local textile waste recycling eco-system

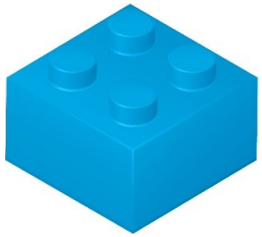
RECYCLING HUB / PLATFORM CREATION

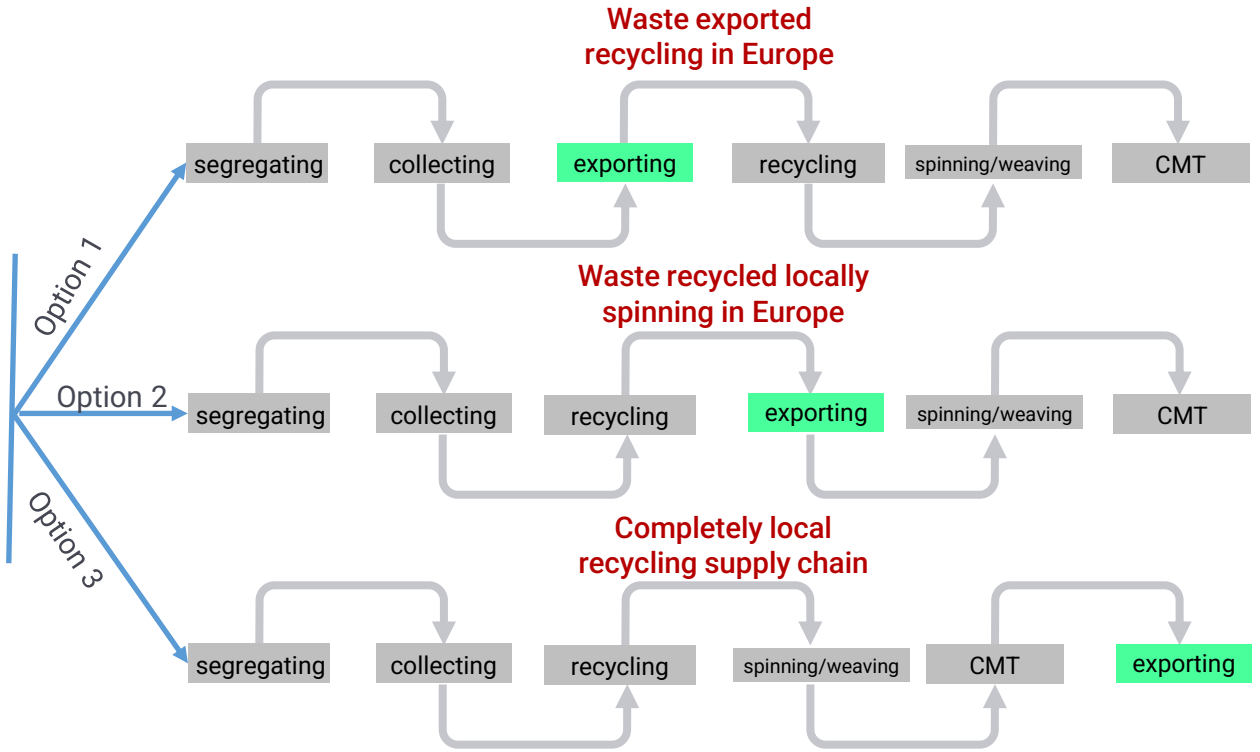
By taking a local approach opportunities arise to aggregate volumes of textile waste within economic zones or textile clusters, connecting to global textile waste trading platforms to make logistics more efficient.

This will allow producers within the same cluster to consolidate volumes of waste and become more attractive to potential recyclers. It could also incentivize new investments by local and international investors

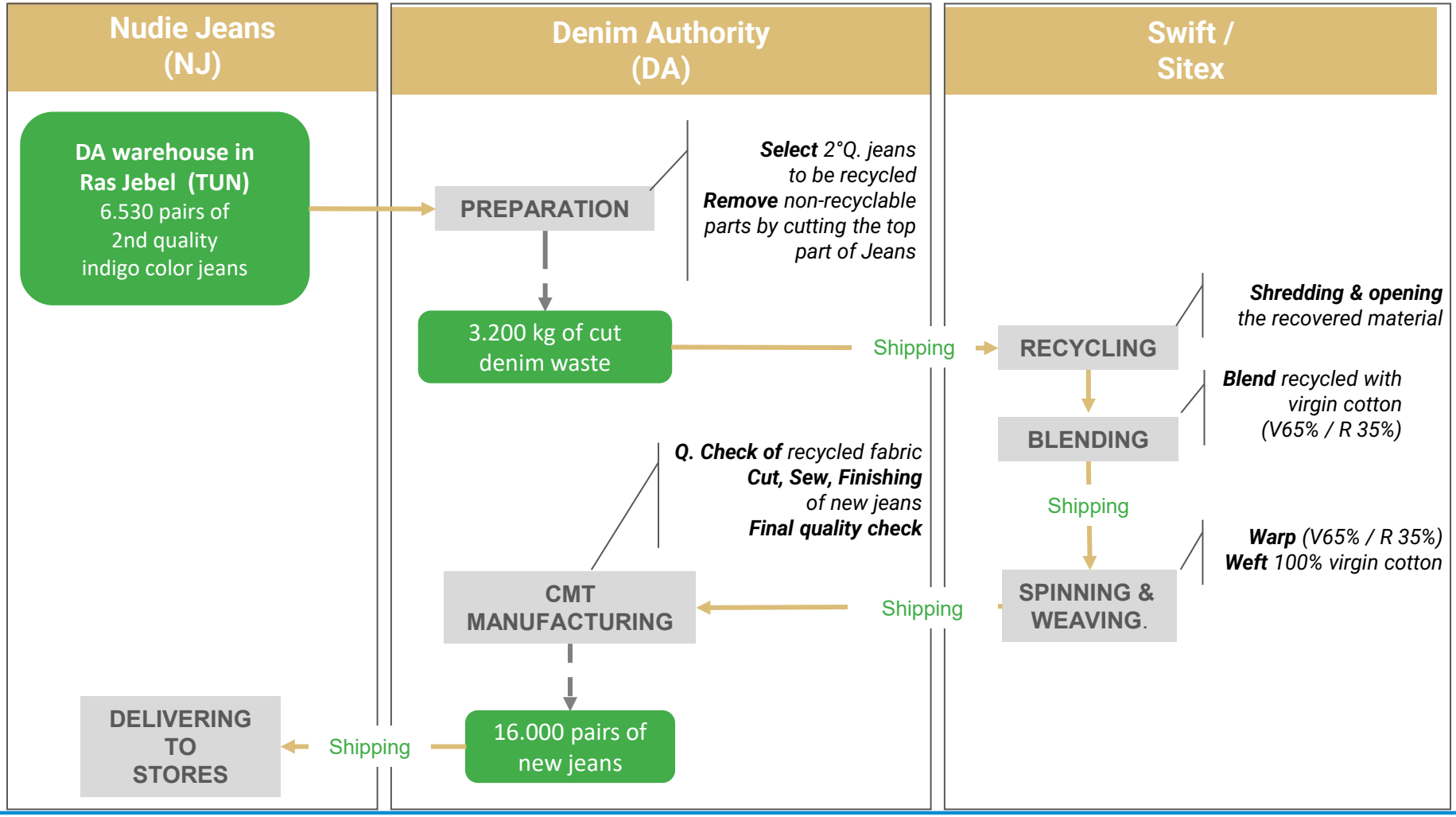
Local vs. international implementation of the building blocks

(2) Fiber to Fashion recycling

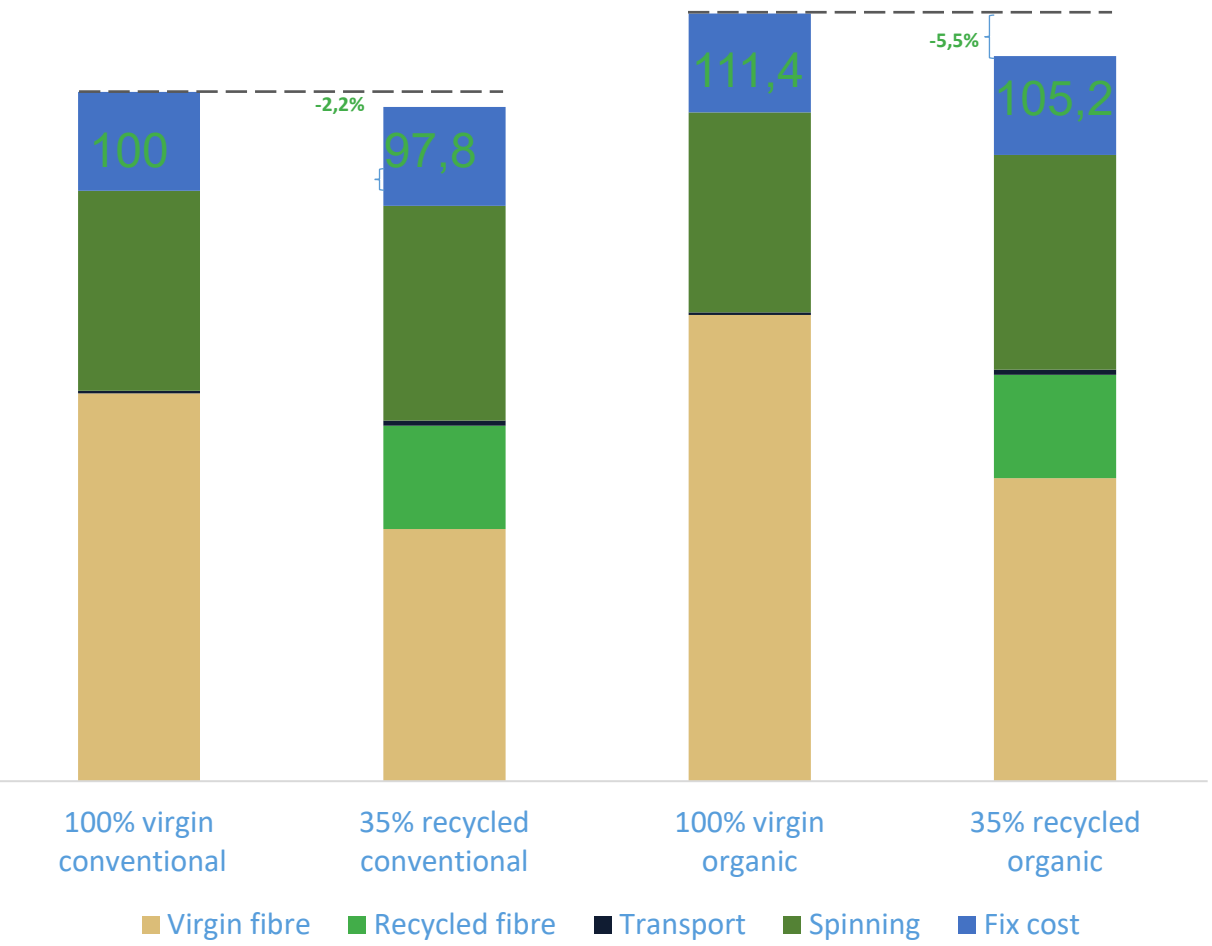




Recycling Deadstock - Pilot from SwitchMed



Business case evaluation: Cost Analysis



YARN MANUFACTURING COST COMPARISON:

100% VIRGIN VS. BLEND 65% VIRGIN 35% RECYCLED

Conventional and organic cotton. INDEX virgin conventional cotton = 100

Calculation results

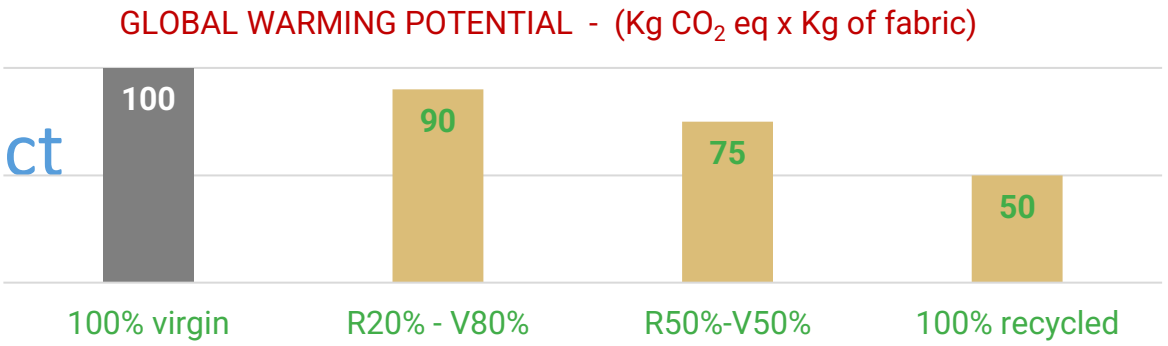
The calculation show that the yarn total cost for the nm12 a blend 65%V / 35%R iused in the warp is very close to a 100% Virgin. Actualy, it is 2,2% lower than the 100% virgin yarn.

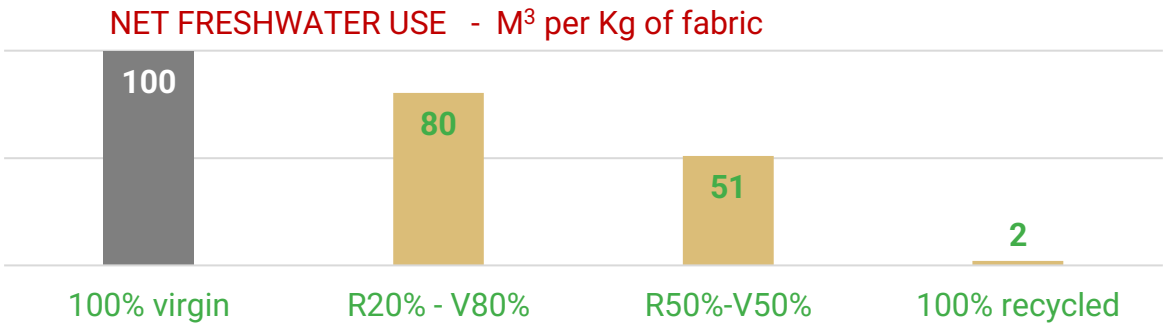
In the case of 100% organic cotton, the price advantage of 35% recycled yarn increases to 5,4% due to the higher price of the virgin organic cotton.

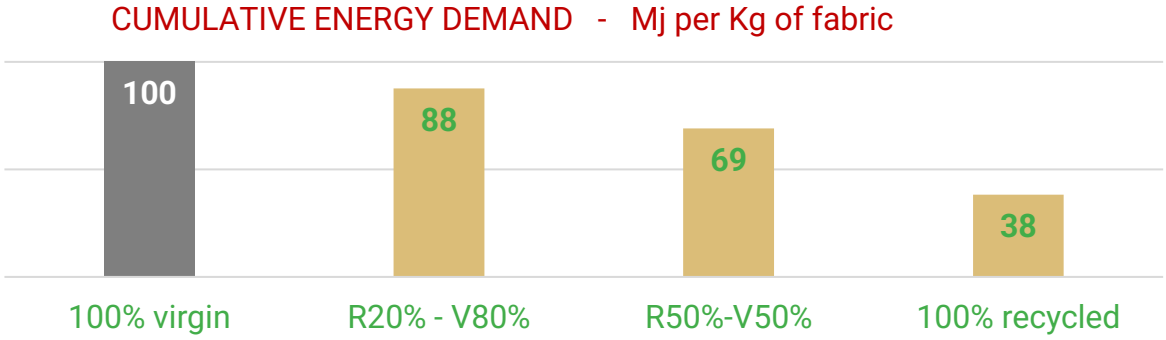
Business case evaluation: Environmental Impact

LCA studies have demonstrated that recycled cotton fibre has a lower environmental footprint than virgin cotton fabric, especially regarding water and energy footprint and Global Warming Potential (GWP).

A 2021 LCA study has calculated that the use of recycled cotton fiber in denim fabric significantly reduces water and energy use and GWP compared to virgin cotton, **depending on the recycled ratio content of denim fabric.**







Business case evaluation: The recycling process efficiency

The waste recycling process is not 100% efficient.
The recycling operations generate new waste that must be managed.

PREPARATION	RECYCLING *shredding & opening*	SPINNING FINISHING & WEAVING	JEANS CMT
~25%	~10%	~19%	~14%
waste generated by cutting the top part of jeans, to clean it from zippers, rivets and buttons.	waste generated in shredding and opening	waste generated in textile operations *Note: a share of the waste generated at this stage is usually recovered and reused in other spinning operations or sold. To other industries.*	waste generated in the cutting of fabrics.

Conclusions

- The Switchmed initiative demonstrates the business case of complete local textile waste recycling models: waste are recycled in the same country where are generated, with a reduced environmental impact and lower production costs compared to the “globalized model”.

- Around 52% of the recovered fibers from the deadstock end up in waste during the recycling process:
  - Recycling content in garments can be increased in many ways
  - Cutting scraps can be utilized through Remanufacturing
  - Industrial symbiosis for downcycling application

- Scaling up the pilot requires a stable amount of waste to guarantee a sustainable capacity use of the recycling units for cost efficency:
  - Collect, classify and segregate cutting waste at the factory floor
  - Local garment producers pool the waste from multiple customers brands
  - Establishing local/regional Hubs for cotton recycling