

ESG in Fashion:

# The Social and Environmental Impact of What We Wear



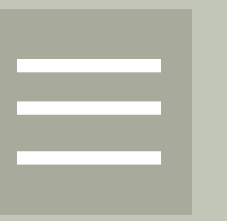
# The Social and Environmental Impact of What We Wear

**An analysis beyond the finances of a sector that employs hundreds of millions of people and represents 3% of the world's GDP.**

**Challenges for fashion, so present in our lives, to become more sustainable. Opportunities and real examples of companies that are taking this seriously.**







# Summary

Clothes are at the same time a basic necessity (animal skin has been used as protection against the weather since prehistoric times) and an element of expression and culture for the individual and the society. We can determine a time in history or infer about people's social status by the way they dress. However, as extreme poverty in the world has been reduced since the middle of the last century, as well as the production costs of clothes and shoes dropped dramatically after the Industrial Revolution (and more recently with the globalization of the production chain), the superfluous consumption of clothing has reached an all-time high and so has its socio-environmental impact.

Regarding the environment, in this sector we have to consider water withdrawal and how it returns to the environment, the use of energy and emissions, toxic chemicals and waste management, and the volume and treatment of solid waste.

Along these lines, the fashion industry (and here we focus on clothing and footwear) accounts for about 8% of global emissions<sup>1</sup> and consumes approximately 79 billion cubic meters of water annually<sup>2</sup>, a resource that is used for agriculture, in dyeing and washing clothes. These are the production stages that also focus on the use of chemicals. Along the chain, it becomes clear that the use of water and the chemical management are linked, and that the water scarcity is caused not only by how physically limited the resource is, but also because of its deteriorating quality. In addition, the volume of microplastics released into the oceans during the washing of synthetic fabrics is equivalent to 50 billion plastic bottles being discarded<sup>3</sup>. When it comes to waste, in the midst of this clothing disposal culture, the sector generates 92 million tons of waste per year<sup>4</sup> – 5% of the world's solid waste<sup>5</sup>. The equivalent of a truckload of textile waste reaches landfills or is incinerated per second<sup>6</sup>.

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<sup>1</sup> Data from the Quantis Measuring Fashion Report (2018). Industry estimates vary widely, typically between 3% and 10% of global emissions, in part due to the complexity of the chain.

<sup>2</sup> Pulse of the Fashion Industry 2017 with data from 2015.

<sup>3</sup> Boucher, J. and Friot, D. (2017) and Ellen MacArthur Foundation

<sup>4</sup> Pulse of the Fashion Industry 2017 with data from 2015

<sup>5</sup> Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. 2018 with data from 2016 of the World Bank. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050

<sup>6</sup> Data estimated by the Ellen MacArthur Foundation, which uses an average density of 150kg/m<sup>3</sup> for a textile bale and a 17.5m<sup>3</sup> load of garbage truck.





Changing the current linear production-use-disposal model is, of course, the most important challenge in solving these environmental issues. The problem is the total use of virgin materials, and here the solution comes first with low impact materials and then with fully recycled and recyclable materials. To do so, it is also necessary to sort out the matter of disposal, since the logistics and recycling technologies that we have today - especially for mixed materials - are limiting. We see many new initiatives encouraging the use and development of more sustainable materials. Such initiatives are, in part, driven by important members of the industry who have been seeking to make their operations cleaner and offer more sustainable products to consumers.

The transparency in the industry is also important. Showing to end consumers the environmental impacts of the pieces in simple terms is an effective and necessary way to encourage the purchase of more sustainable products. Traceability is the first step towards having this transparency about the chain. It is still difficult for brands to reach the raw materials stage, which is why they depend on certifications. A key tool is the **Higg Materials Sustainability Index** (Higg MSI), which provides a standardized measure of the environmental impacts of different materials, from the raw material stage to the final product.

On the social side, in a sector in which 80% of the workforce is female, but there are few companies with reasonable percentages of women in executive positions, there is no shortage of scandals involving large brands associated with precarious working conditions/analogous to slavery. Due to its labor-intensive nature and increasing costs to comply with labor legislation, the fashion industry has installed a significant portion of its chain in poor countries with cheap labor, mainly Asian nations, resulting in complex globalized supply chains that are difficult to regulate. In these countries, non-compliance with the local minimum wage is a recurrent practice, even though this is often not enough to guarantee a livelihood. Informality is high, which makes it even more difficult to inspect and measure statistics for the sector as a whole.

Structurally, the roots of the social problems in the industry are the vague contracts, short delivery times (with suppliers resorting to excessive overtime),



outsourcing and occasional work, insufficient remuneration to cover the production costs, among others.

Another factor that adds complexity to this discussion is the relevance of this industry to some of these Asian nations. There are countries to which the export of clothing and shoes represents a significant portion of the GDP and of their total exports, like Cambodia (about 35% of the GDP in 2019) and Bangladesh (close to 75% of exports)<sup>7</sup>. This must be taken into account in the search for solutions and improvements.

The pandemic exposed the imbalance in the bargaining power of the sector, with reputable brands canceling orders that many times had already been manufactured without any responsibility to their chain. In Asian economies that are highly dependent on this industry, as mentioned above, the effect was even more severe.

With the complexity of the socio-environmental issues of the sector in mind, it is important that the stakeholders (brands, investors, consumers, governments and elements of the chain) collaborate to seek solutions for the different stages of the production chain, from design to the production of raw materials, manufacturing of the pieces, sale, use and after use.

Table I.

Sensitive points in the production chain of the clothing and footwear sector

Ambiental	Emissions	Energy use	Water Withdrawal and Treatment	Use of environmentally harmful chemicals	Other impacts to the environment
Social	Human rights and community relations	Sales system and transparency of the sector	Labor practices throughout the chain – working conditions and transactional security	Occupational health and safety – especially in the beginning of the chain	
Governança	Ethical issues in the supply chain	Product development – from design to production chain	Transparency	Leadership engagement with problems in the production chain	

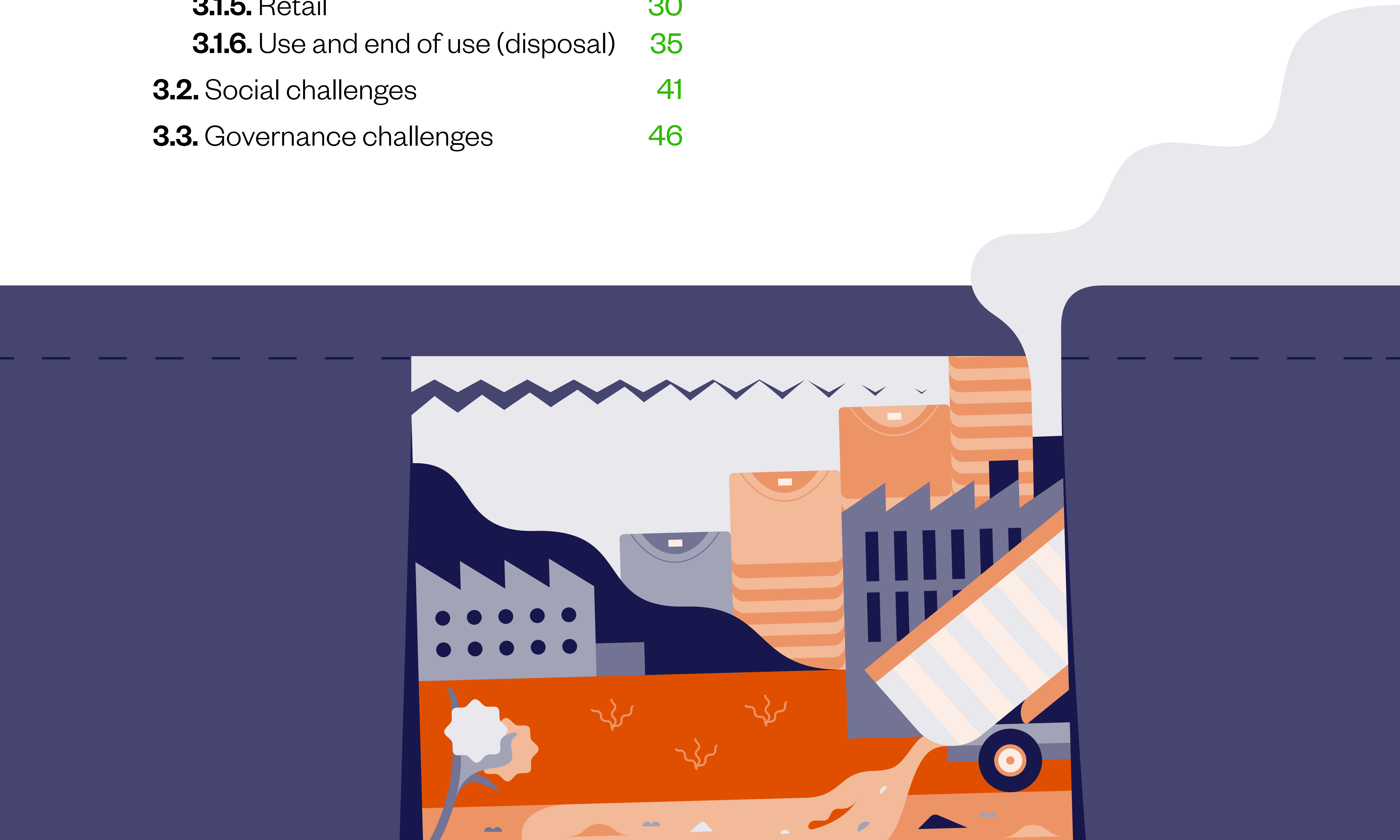
<sup>7</sup> World Bank, UN Comtrade, WTO and World Footwear Yearbook 2019

**Tabela I**  
Prepared in compliance with the SASB - Sustainability Accounting Standards Board criteria in addition to proprietary analysis



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# 1. Introduction

This is our second ESG Letter (Environmental, Social and Governance). Our aim is to bring information, reflection and knowledge to the investors and the general public about these principles, which tend to increasingly guide the business. The path is long, the process is slow and requires careful study by analysts, as the data on these topics are often confusing and poorly standardized.

On the one hand, we see initiatives that are not very relevant serving as marketing, as companies engage in greenwashing. On the other hand, we are increasingly seeing companies and executives embarking on a journey that goes beyond the superficial approach, understanding the real relevance of the matter for the long-term sustainability of their business. Consumers are paying more attention and ESG values are on the radar of key players in a growing number of industries. We believe that the companies most committed to their material causes will be rewarded.

**Our first letter** – published in July 2020, covered the topic in general terms, showing concepts, principles and the evolution of thinking about the elements that make up ESG values throughout history. We showed numbers for market values, consumption trends and brand positioning for consumers and the financial market.

From now on, we want to think about ESG focusing on major themes or market segments. In this issue, we are going to talk about ESG in the fashion world – apparel and footwear. We took a dive into the production process in order to understand the challenges, map the difficulties and the solutions that have been found to reduce the negative impacts. We wanted to understand the origin and how the raw materials are extracted, cultivated and processed; the logistical challenges; the stages of the production process and its complex labor issues; the design; waste; reuse possibilities; as well as new consumer behaviors and those that still need to be changed.

Based on our study, we will present an analysis of the clothing sector in the global market and the challenges to overcome, illustrating the information with examples of successful initiatives.

We believe this way we are able to bring qualified information to investors, to members of the production chain, and also to the target public seeking to optimize their investment and consumption choices.

Enjoy your reading.

**JGP Asset Management Team**





2.1.2.3.4

# The global clothing and footwear industry

Valued at around USD 2.4 trillion<sup>8</sup>, and responsible for 300 million jobs along the chain<sup>9</sup>, the fashion industry has more than doubled in size in the number of items sold since the 2000s, when the fast fashion phenomenon gained traction. Responsible for 3% of the world's GDP<sup>10</sup>, approximately 8% of the emissions<sup>11</sup>, and using 79 billion cubic meters of water per year (enough to fill almost 32 million Olympic-size swimming pools)<sup>12</sup>, the sector can be divided into three large segments: apparel, footwear and sportswear.

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<sup>8</sup> According to data from the United Nations Environment Programme (UNEP) of 2019 published by the newspaper Valor Econômico. The figures are in agreement with the 2019 McKinsey's The State of Fashion report, which rates the global industry at USD 2.5 trillion with numbers from 2017.

<sup>9</sup> Because of the disproportionate amount of informal workers and a highly dispersed chain, it is very difficult to specify the number of professionals involved in the sector. There are different estimates coming from large organizations such as the International Labor Organization (ILO), the UNEP, the Ellen MacArthur Foundation, among other renowned institutions. Some differentiate between workers employed directly and indirectly. We chose to use the Ellen MacArthur Foundation data.

<sup>10</sup> The World Bank

<sup>11</sup> Data from the Quantis Measuring Fashion report (2018). Industry estimates vary widely, typically between 3% and 10% of global emissions, in part due to the complexity of the chain.

<sup>12</sup> Pulse of the Fashion Industry 2017 with data from 2015.

<sup>13</sup> <https://shenglufashion.com/2014/03/24/global-apparel-and-footwear-market-update-2014/> (Accessed: 7 August 2021) with data from Euromonitor

Apparel is the slice that comprises the general clothing market – from everyday use to special occasions. It is divided into women's (approximately half<sup>13</sup>), men's (about a third) and children's clothing, and accessories. Sportswear is the niche that includes sports and casual clothing, those that people tend to “wear at home” or to play sports. This niche became more popular during the pandemic, with the growth of the athleisure trend (using sportswear in other environments), and reinforces industry forecasts of an increase in the use of polyester in the total amount of fibers used worldwide.





In general, the industry experienced a drop in revenue in 2020, but it did not affect the market share of the big brands. The top ten players maintained their market share or gained ground in 2020, including sports brands Nike and Adidas, and fast fashion companies Uniqlo, H&M and Zara. It is important to mention that this is a highly fragmented market, and the largest corporations own relatively modest percentages.

Physical stores are the main sales driver despite the substantial increase in online sales since the beginning of the pandemic. The percentage of online shopping varies greatly by country, but in global commerce, it went from approximately 20% to 30% in 2020<sup>14</sup>. E-commerce has several challenges that range from customers who are not used to online shopping to economic and technological issues, like reverse logistics and the lack of standardization of clothing sizes.

Graph I

## Growth of clothing sales and decline in clothing utilisation since 2000

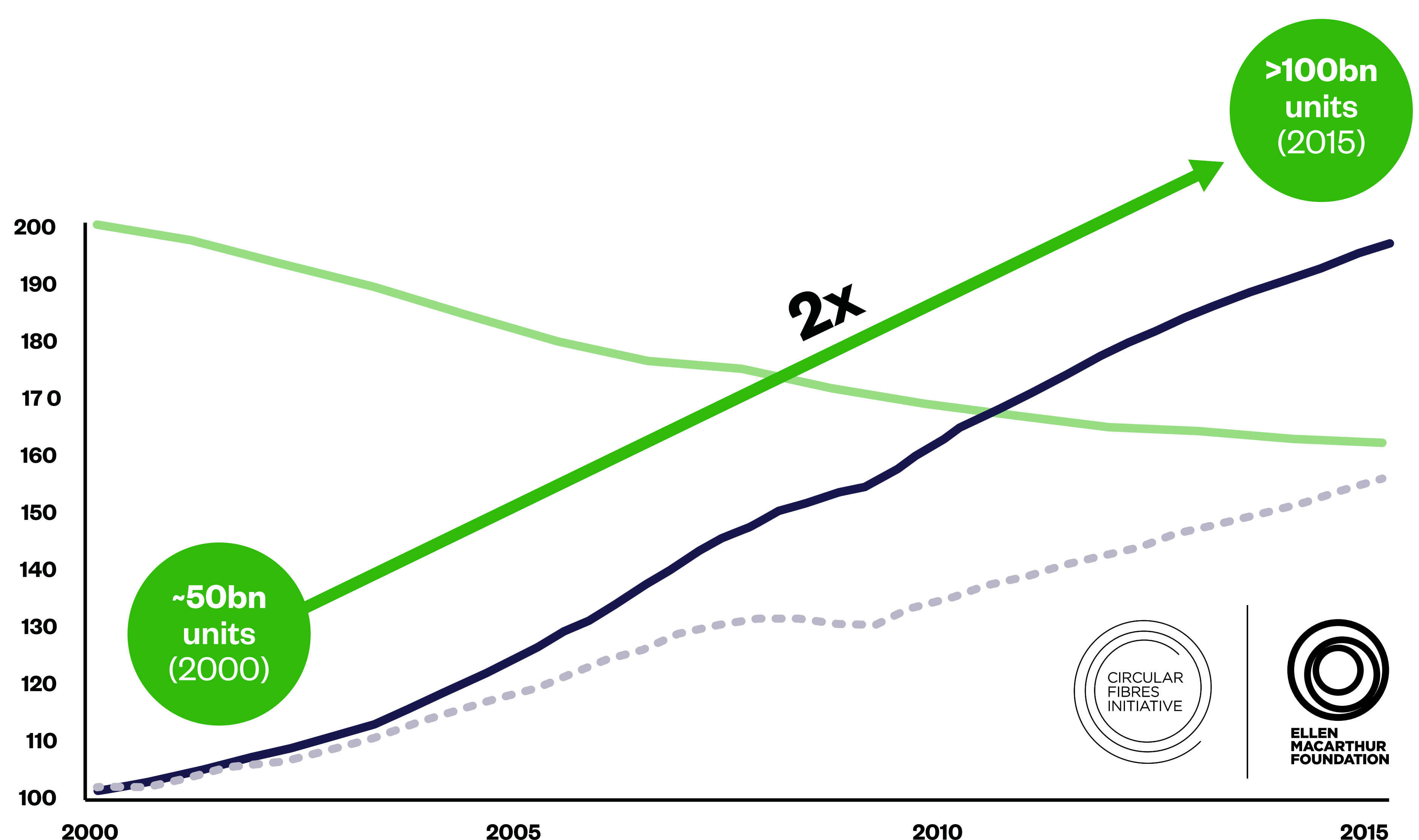
Index 100 in 2000

- World GRP
- Clothing Sales

Number of times an item is worn<sup>1</sup>

- Clothing utilization

<sup>1</sup> Average number of times a garment is worn before it ceases to be used



<sup>14</sup> Business Finland report *Navigating New Digital Landscape* (2021) with data from Euromonitor

### Graph I

Of the Ellen MacArthur Foundation study A New Textiles Economy





2.1.2.3.4

# Production Models

There are three main models in the fashion value chain: push, pull, and push-pull. The choice of model influences the environmental impact of the process:

- **Push** – oriented towards a stable demand in which there is a scheduled supply, that can be seasonal or not, but follows prior planning.
- **Pull** – variable, adaptable to market fluctuations.
- **Push and pull** – a mixed model with the initial stages of the chain operating in a scheduled manner (push) and the final stages driven by demand (pull).

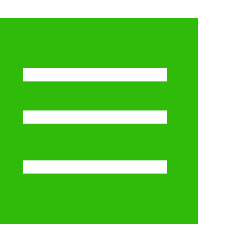
With the push-pull strategy, brands are able to simultaneously respond to market trends and achieve shorter production cycles, when compared to the pull approach.

For a long time, most brands used exclusively the push system, with scheduled production and delivery without attention to the demand fluctuations of the market. One of the results of this model in the clothing chain (but not exclusively) was high waste, both in raw material and in the excessive disposal of items.

Thus, market demand and competition led this industry to gradually adapt to the pull system, which is more suitable for rapid fluctuations in demand and does not require prior planning.

**After oscillating between the two models, the big brands understood that the best option would be the hybrid system:**



**01.**

Part of the production with larger inventory (push) – focused on the so-called basic models and higher quality items – and part depending on the demand (pull) – referring to those aligned with the current fashion trend and items with a shorter life cycle. Between these two there is a third production line, which can be considered of medium duration. These are products that are slightly on trend, but which also have characteristics of the basic items.

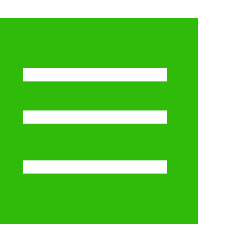
**02.**

The push-pull system can also be used alternately within the process, with the push approach in the first stages and the pull in the latest stages of the chain. The duration of the cycle may also vary depending on the brand or region where the process was established. The more seasonal items a company has, the greater its uncertainty in the market.

# Zara reduces cycle with hybrid production model

A successful case that became a reference in the push-pull model is Zara's (Inditex). Through this approach, the Spanish fashion retailer was able to notice trends and quickly take them to the stores, with a much shorter cycle than usual (for this, among the alternatives, it sought to work with suppliers closer to the operation). It reduced the need to forecast what would be successful before the collection, avoiding waste and, consequently, considerably reducing the need for sales. This system, if on the one hand is more efficient (it produces fewer items that have no demand), on the other it ends up promoting the consumption of an increasing number of items, as we see nowadays.



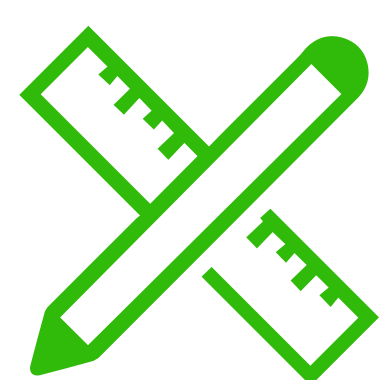


## 2.2.3.4

# Stages of the Production Chain



It is possible to divide the production chain of the apparel industry into seven stages. In all, there is the possibility of adopting processes that are more aligned with more sustainable practices. Some measures are simple, while others have very complex challenges. We will cover each of the themes in more detail in [chapter 3](#). About the stages:



### 01. Design

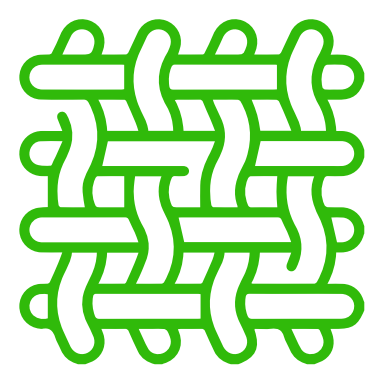
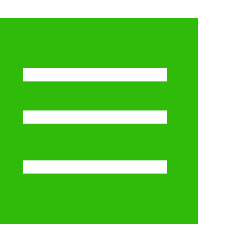
At this stage, the items are designed and the chain is established. The shapes and materials to be used are defined. The concern with the environment can take place at this stage in the choice of materials that will make up the item; how fabrics will be treated to meet the design; the expected durability of the product (quality of the raw material and longevity of the design); a design that allows the greatest possible use of the fabric; and facilitates recycling by avoiding different materials in the same item.



### 02. Raw Material

Here we have the process of growing or creating the materials, which will become the fibers that will originate the fabrics or the base and cover of shoes. In this stage, it is also possible to choose more sustainable materials, which are produced and treated in a way that is less harmful to the environment. Such materials make rational use of energy, do not harm the health of those who produce them, have a long life cycle, and can be reused.





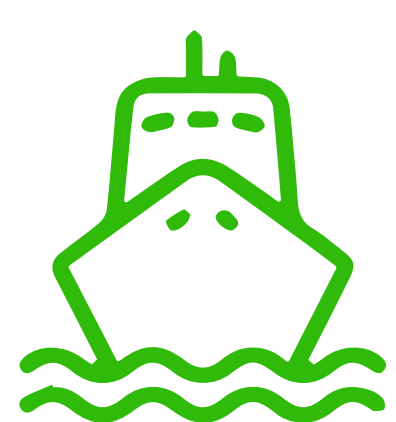
### 03. Processing

In this stage, the raw material is spun into fibers that are then woven into fabrics of different colors and prints. Rubber and leather are treated and dyed. In the transformation of raw materials, it is possible to optimize the use of energy, either by choosing renewable energy or through rational use. There are also ways to improve the chemical waste management process, and review labor relations and working conditions.



### 04. Manufacturing

When transforming fabrics into pieces, it is possible to review the waste of material, the use of chemicals, and improve safety conditions and labor rights.



### 05. Transportation

This is the stage that has the lowest impact, as the majority of the transportation is done by sea, but the impact to move toward air transportation, for example, would be high.



### 06. Retail

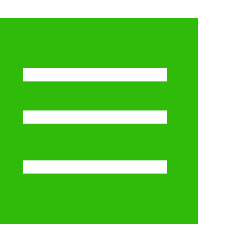
This is when the items are offered to consumers in physical stores and, more recently, via e-commerce. In this stage, in addition to the rational use of energy in the stores, there is an opportunity to review the packaging process, especially in digital sales. Another aspect that has not been greatly explored is the role of retail in raising consumer awareness regarding the rational consumption of clothing and footwear. After all, this is the highest point of contact of the entire chain with the final consumer. It is a complex debate that involves several factors to make consumption more rational and maintain the financial health of the brands at the same time. The waste of items is much higher than one can imagine, as we will see in this letter. There are brands working on this, but very few initiatives.



### 07. Use and end of use (disposal)

Very few items are recycled, as the absolute majority ends up in the trash or burned. In this stage, it is possible to think about improvements in the washing process, reducing the complexity of reverse logistics, mitigating premature disposal and, above all, ways to extend the life span of the pieces.





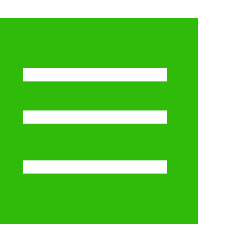
# 2.3.4 Global Market

Cotton that is planted in Brazil can be transformed into a shirt in Vietnam and sold in a mall in the United States. This is the summary of the globalization of this highly complex chain. China is the world's largest exporter of apparel and footwear. The manufacturing process is concentrated in Asia, and is the basis of the economy of some countries. Asia is responsible for a little over 60% of exports of finished items, according to data from 2019. China accounts for half that amount, followed by Vietnam, whose economy is heavily dependent on this industry. Bangladesh and Cambodia also have the fashion industry as their main export channel. In Bangladesh, garments and shoes represent almost 75% of exports and, in Cambodia, around 45%<sup>15</sup>. The worst labor problems in the supply chain are precisely in Asia. We will see more details about this in [chapter 3](#).

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<sup>15</sup> WTO, the World Bank, UN Comtrade and World Footwear Yearbook 2019





# 2.4

## Variations in Consumer Culture

The fast fashion industry is very sensitive and goes through different stages of acceptance, depending on the geographical location. Consumers in European countries such as Portugal, Sweden, United Kingdom, Norway, among others, are having second thoughts about fast fashion. Emerging countries are going in the opposite direction, though. The amount of clothes per capita in China is growing, reaching levels of the so-called rich countries, like the United Kingdom. This increase in the quantity of garments per capita is becoming common in developing economies.

Considering the size of the Chinese population, and that 84% of the world population lives in “less developed” nations according to the UN, this trend of expansion of per capita consumption is a cause for concern. This happens for two reasons: the general impact on the chain and the increase in the number of pieces that are being discarded. The disposal of the pieces is a highly sensitive point, as we will see.

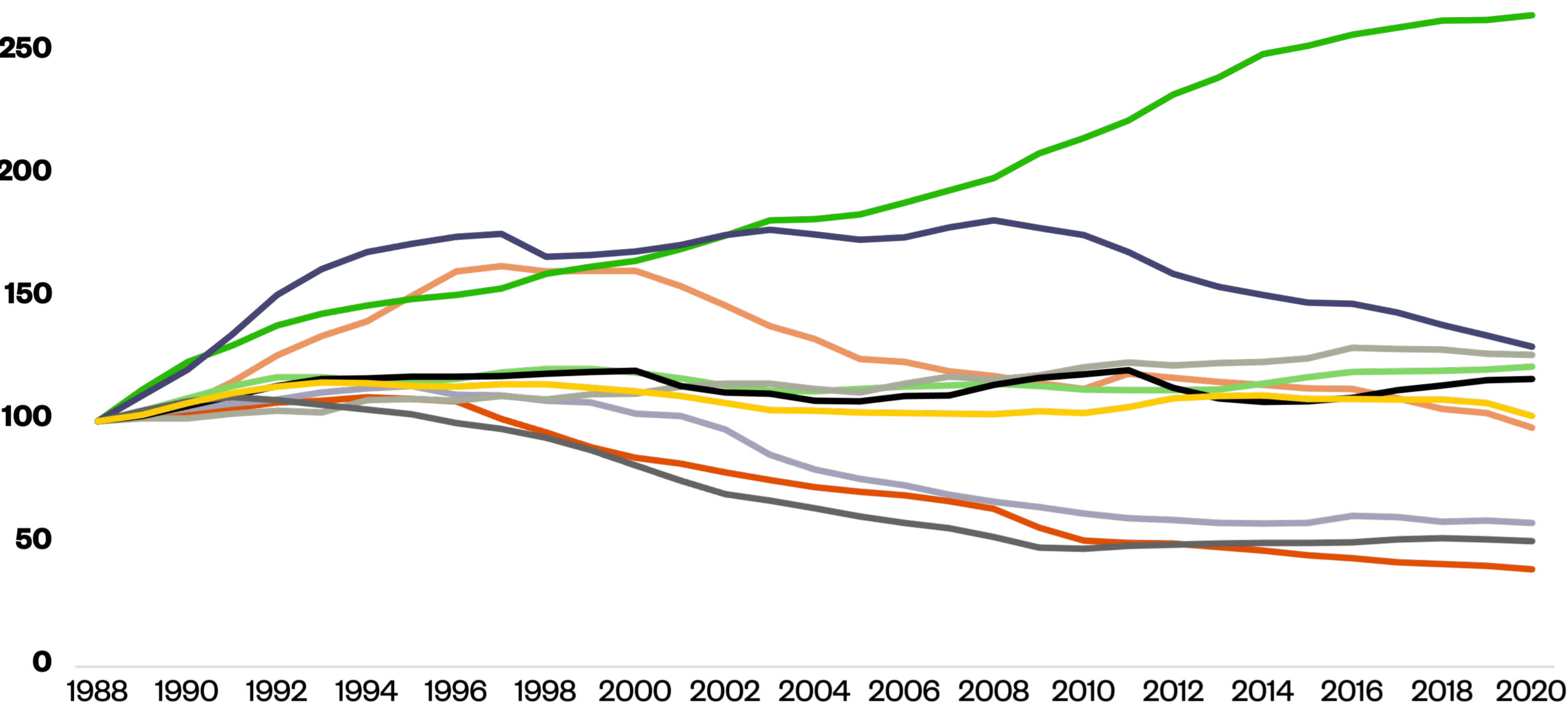




Graph II

Inflation of clothes and shoes

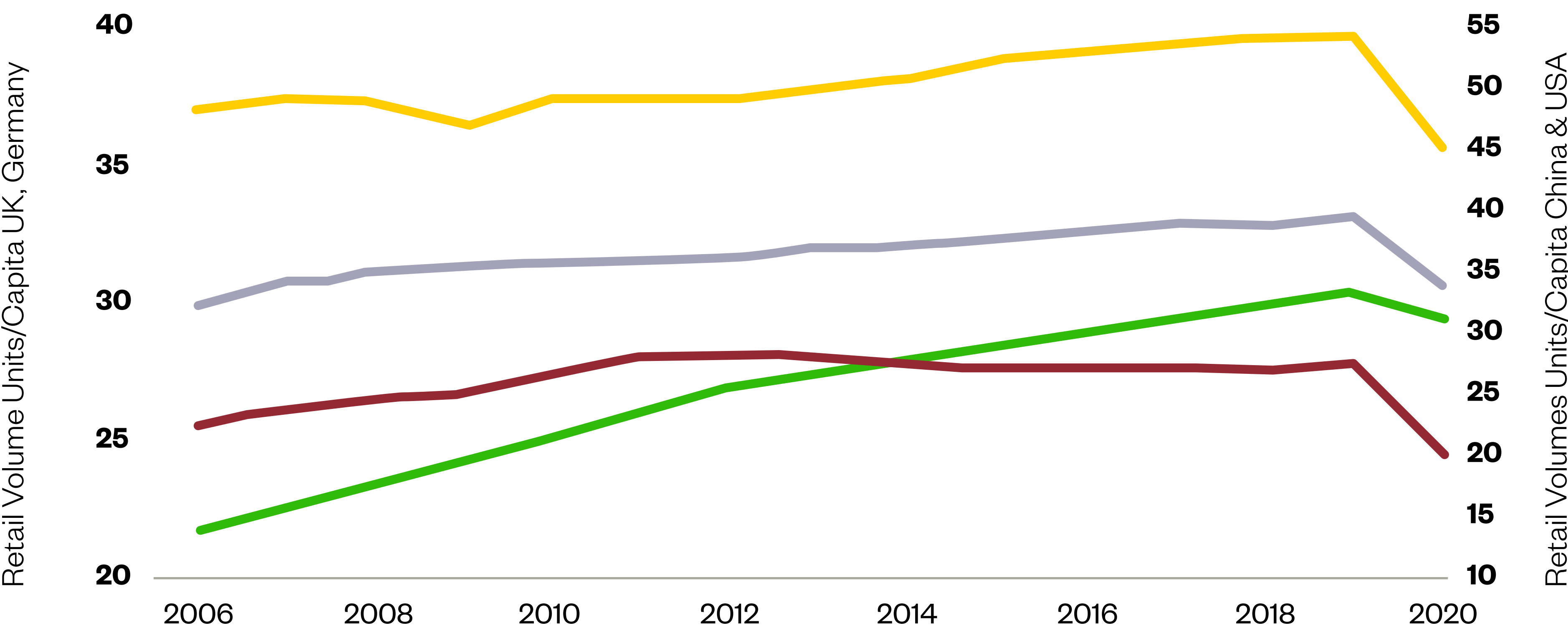
- Ireland
- Israel
- Japan
- Korea
- Norway
- Portugal
- Sweden
- Switzerland
- United Kingdom
- United States



Graph III

Number of items per capita

- Germany
- United Kingdom
- China
- United States

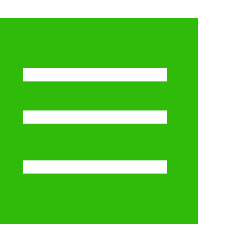


Reducing consumption, however, is no trivial matter for consumers and corporations. How to tell millions of people who, perhaps for the first time in their lives, are managing to have a fuller wardrobe, that now they have to buy less and reuse items? How to change from diversity and quantity – keeping up with the latest fashion trends – to promote longer lasting items in smaller quantities, while the market says the opposite? How can you help bring about this change in behavior through your campaigns and sales teams that are paid by commissions? How to reconcile this reduction with the fact that corporations naturally seek to grow over time? Reversing this trend and curbing the increase in the consumption of items is far from simple.

Graph II  
OCDE and BLS

Graph III  
UBS Global Research: Q-Series: A \$2.5trn industry at risk





3.1.2.3

# ESG Challenges for the Fashion Industry

When we look at the fashion supply chain from an ESG perspective, it is possible to find very sensitive points that challenge the players. The industry accounts for approximately 8% of the carbon footprint of the planet. A few initiatives with less impact have already gained market share, such as the cultivation of BCI cotton (Better Cotton Initiative), which has several improvements when compared to conventional cotton. Others are not scalable and related to isolated initiatives of certain brands, such as design optimization, or more effective actions towards inspection of the production chain and consumer awareness.



Graph IV

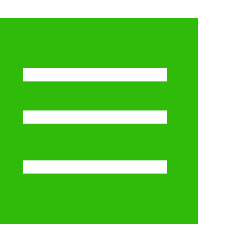
**Sensitive points in the production chain of the Clothing and Footwear sector**

Ambiental	Social	Governança
<div><div>— Emissions</div><div>— Energy use</div><div>— Water withdrawal and treatment</div><div>— Use of environmentally harmful chemicals</div><div>— Other impact on the environment</div></div>	<div><div>— Human rights and community relations</div><div>— Sales system and transparency in the industry</div><div>— Labor practices throughout the chain – working conditions and transactional security</div><div>— Occupational health and safety especially at the beginning of the chain</div></div>	<div><div>— Ethical issues in the supply chain</div><div>— Product development – from design to production and supply chain</div><div>— Transparency</div><div>— Leadership engagement with problems in the production chain</div></div>

Matters regarding the use of water and energy efficiency are present practically throughout the entire chain with more or less impact, depending on the stage of production or use. Issues related to safety, working conditions and decent remuneration also have a high impact, mainly, but not exclusively, in manufacturing. We will see below the impacts and most critical points of each of the seven stages presented in item 2.2.

**Table I**  
Prepared in compliance with SASB - Sustainability Accounting Standards Board criteria in addition to proprietary analysis





# 3.1.2.3.

## Environmental Challenges

The clothing and footwear industry has a relevant impact on the environment. It generates approximately 92 million tons of waste per year<sup>16</sup>, which represents 5% of the total<sup>17</sup>. The equivalent of a truckload of textile waste is incinerated or disposed of in landfills per second around the world<sup>18</sup>. Waste generation occurs throughout the chain to a greater or lesser extent depending on the raw material used and the production system adopted.

There is a strong impact on energy and water contamination. The fashion industry uses 79 billion cubic meters of water per year<sup>19</sup>. Approximately 20% of industrial pollution that goes into the water comes from the dyeing, treatment and finishing of textiles<sup>20</sup>. Decisions that help to increase or reduce this impact can be made at any stage in the process.

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<sup>16</sup> Pulse of the Fashion Industry 2017 with data from 2015

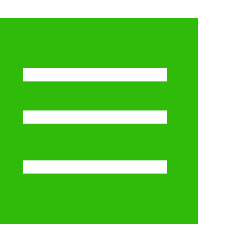
<sup>17</sup> Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. 2018 with data from 2016 of the World Bank. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050.

<sup>18</sup> Ellen MacArthur Foundation

<sup>19</sup> Pulse of the Fashion Industry 2017 with data from 2015

<sup>20</sup> World Bank





## 3.1.1.2.3.4.5.6 Design

The definition of the intensity of the environmental impact in the chain starts with the design. In this stage, the material is chosen. The shape and cutting lines of the piece are defined, a decision that will imply in more or less utilization of the fabric and how much will go to waste. In the design, there is also the decision of how much this piece can or cannot be recycled. The choice of raw material and the decision on whether there will be a mixture of fabrics and accessories implies whether recycling is easy or not. The more the materials are mixed, the more labor intensive the recycling process will be. The degree to which the design is closer to basic pieces or items that are more in line with the latest fashion trends also influences the intensity of the environmental impact.

## 3.1.2.3.4.5.6 Raw Material

Divided into two groups: natural and synthetic.

Raw materials require a thorough review of their cultivation and sourcing process.

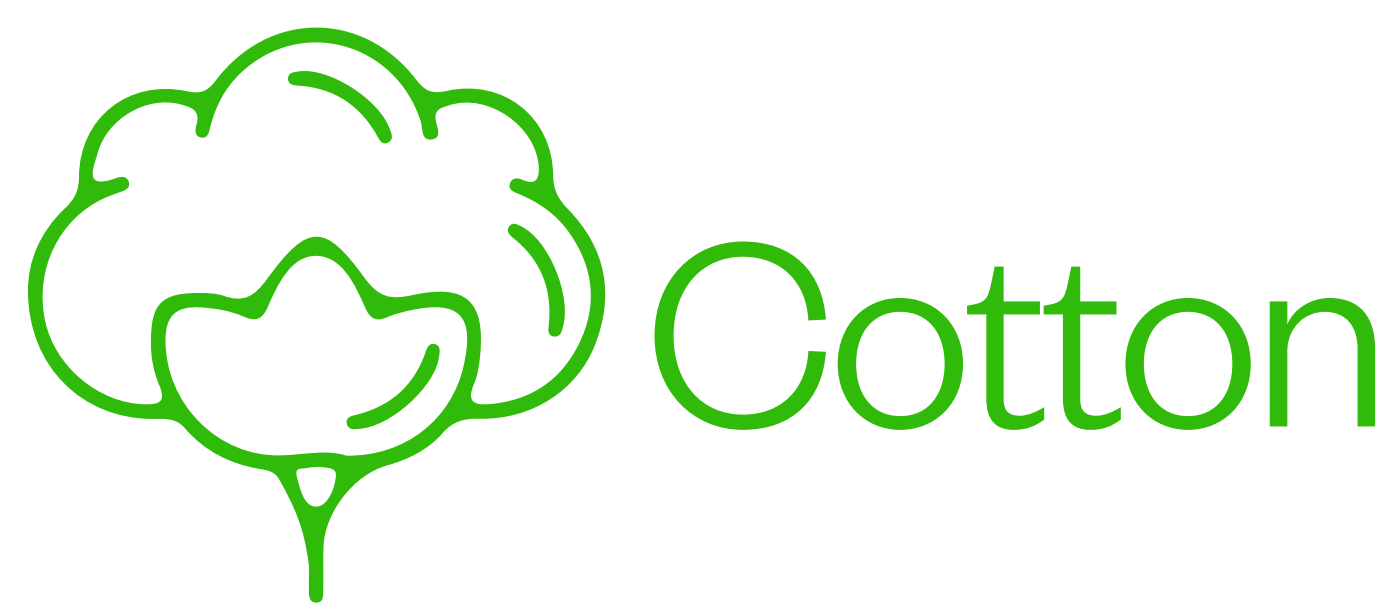
In the group of natural materials, which are mainly cotton and leather, the use of water and chemical residues are the most complex elements of the chain.

Before analyzing the main materials, it is important to mention that each type of raw material generates products with very different characteristics, so it is not possible to compare these types directly. Cotton, for example, offers softness and comfort; polyester provides elasticity to garments and has a competitive price; and leather is resistant and ideal for shoes, boots, and is also used in coats and jackets. However, it is important that brands and consumers keep in mind the impacts of each material, so that they make conscious decisions and can look for alternatives within each category.





## Next, we will learn processing details of the main materials of the industry



Cotton accounts for 23% of the fibers produced worldwide<sup>21</sup>. Almost a quarter of this material already complies with the BCI (Better Cotton Initiative) standard, an international non-profit organization that operates in 23 countries and brings together various players in the sector with the aim of promoting more sustainable practices, helping producers during the cultivation. In Brazil, the certification issued by Abrapa (the Brazilian Association of Cotton Producers) has requirements similar to those of the BCI standard, as well as the CmiA (Cotton made in Africa) issued in that continent. With Abrapa's cotton, we are the country with the largest production of Better Cotton in the world, with 2.17 million tons produced in the 2018-2019 crop, around 40% of the global production of BCI cotton or 8.5% of the total cotton (including the traditional production and more sustainable forms of production).

Conventional cotton uses approximately 6% of all pesticides in the world. These pesticides are absorbed by the soil and end up in the rivers because of the natural waste transport system. Depending on the agricultural process, the deforestation to establish a monoculture can have a strong impact on the ecosystem.

There is also organic cotton, which accounts for 1% of the market and, despite being the best virgin option, is not yet scalable.

### The BCI production process:

- Minimizes the harmful impact of crop protection practices  
E.g.: Via integrated pest management
- Promotes the efficient use of water  
E.g.: Via humidity monitoring
- Takes care of soil health
- Conserves natural habitats and increases biodiversity
- Preserves and takes care of fiber quality
- Promotes decent working conditions
- Operates efficient management systems.

<sup>21</sup> Textile Exchange





By drawing a parallel between the different types of cotton, it is noted that the common variety generates much more impact than BCI and organic. Regarding the latter, although the organic product has environmental advantages when compared to BCI, it is important to consider the economic issue mentioned above. In terms of scale, BCI is able to achieve much greater efficiency than organic, for example, by being able to use genetically modified seeds and less harmful pesticides. When compared to conventional cotton, BCI manages to reach prices that are very close and, in some cases, even more attractive.

The rational use of water in cotton production is a global concern. Countries like India, Pakistan and Turkey are subject to severe water stress. In these countries, respectively, 80.2%, 76.3% and 61.7% of the territory is under severe water stress. In Brazil, this percentage is only 0.3%<sup>22</sup>.

Cotton planting, especially the conventional type, uses high amounts of chemicals. This crop is responsible for using 4% of the world's nitrogen and phosphorus fertilizers. Despite covering only 2.5% of arable land, its production disproportionately uses 16% of insecticides and 4% of herbicides, totaling 6% (in value) of pesticides on the planet.<sup>23</sup>

<sup>22</sup> *Valuing Our Clothes*, by WRAP.

<sup>23</sup> *Pan UK, A review of pesticide use in global cotton production (2017)* and the Ellen MacArthur Foundation.

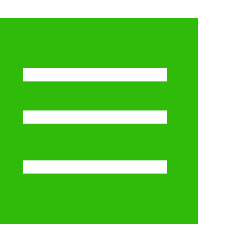
<sup>24</sup> Kirchain, R., Olivetti, E., Miller, T., & Greene, S. (2015)



Natural leather, even though it is a by-product of cattle (it represents between 5% and 10% of the value of the animal), has a considerable impact on the environment, especially during the raw material and processing stages. Cattle raising is responsible for strong methane gas emissions, which have a significant impact on climate change. The extraction and treatment of leather uses large quantities of water and generates highly toxic residues, mainly due to the use of chromium to tan the material, as we will see in processing. The leather chain alone has the highest level of environmental impact. Half of the leather produced is destined for the shoe industry, and 64% of the leather is of bovine origin <sup>24</sup>.

It is important to emphasize that when the impacts of leather on the clothing supply chain are processed, the values must be calculated considering only the impacts associated with the fashion industry, among the various markets associated with the animal. Cattle raising prioritizes the meat industry and its process includes an ethical debate regarding animal welfare and the growth of vegetarianism and veganism. In addition to bovine leather, the sector – mainly shoes – uses alternative skins and hides





from other animals, including fish. These are materials that would initially be discarded because they have little use for other segments.

## Polyester

Derived from petroleum, polyester and synthetic rubber go through an extraction process that consumes high amounts of energy and water (graph V). There is a high impact of polyester also on water contamination, resulting from the washing process of clothes. Polyester accounts for 52% of the fibers produced<sup>25</sup> and should reach 65% in 2030<sup>26</sup>.

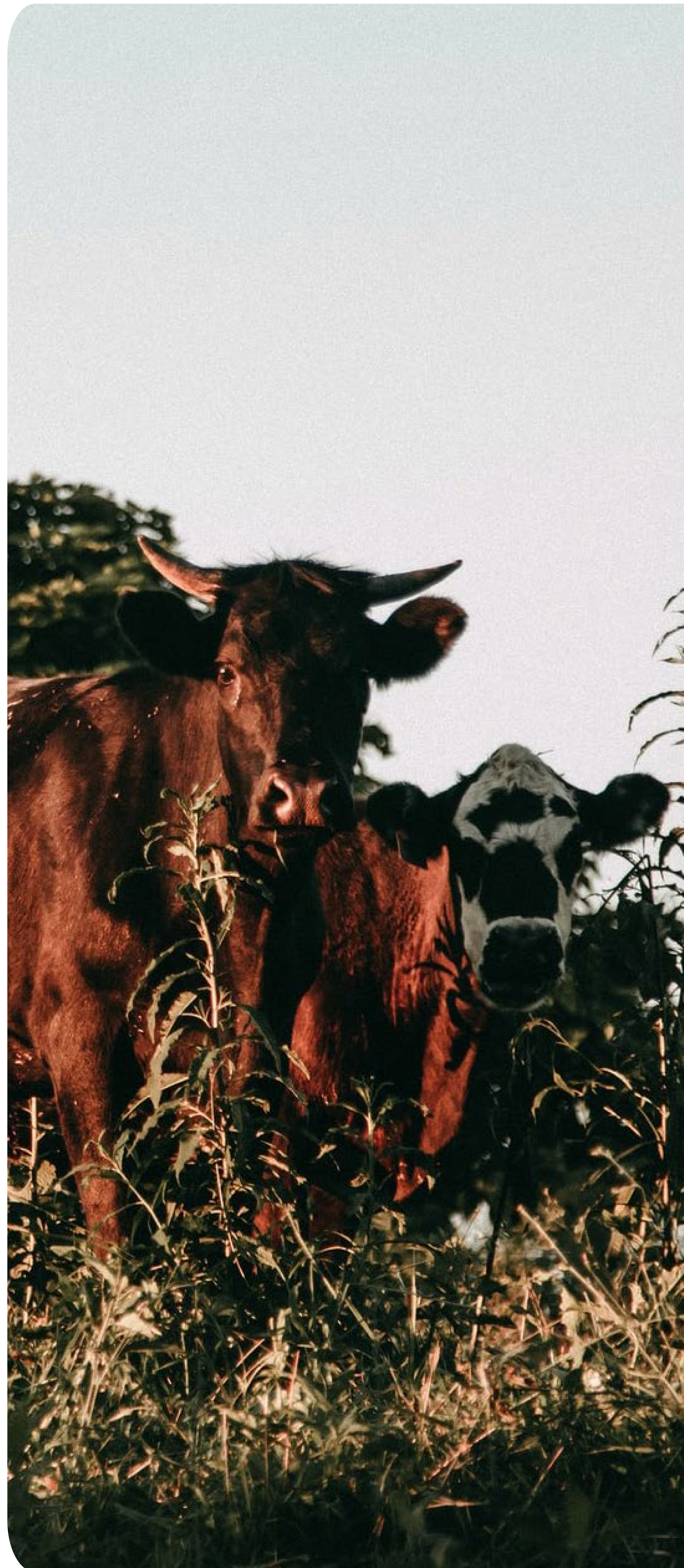
## Rubber

Primarily present in the soles of shoes, emissions from rubber extraction are concentrated in the raw material and molding stages. Styrene-butadiene rubber (SDR) is the most common synthetic rubber. It is the one found in car tires and has the same origin as polyester – petroleum.

<sup>25</sup> Textile Exchange

<sup>26</sup> Jacobs, M. (2020)

**Photo** [Ryan Graybill](#) (Unsplash)

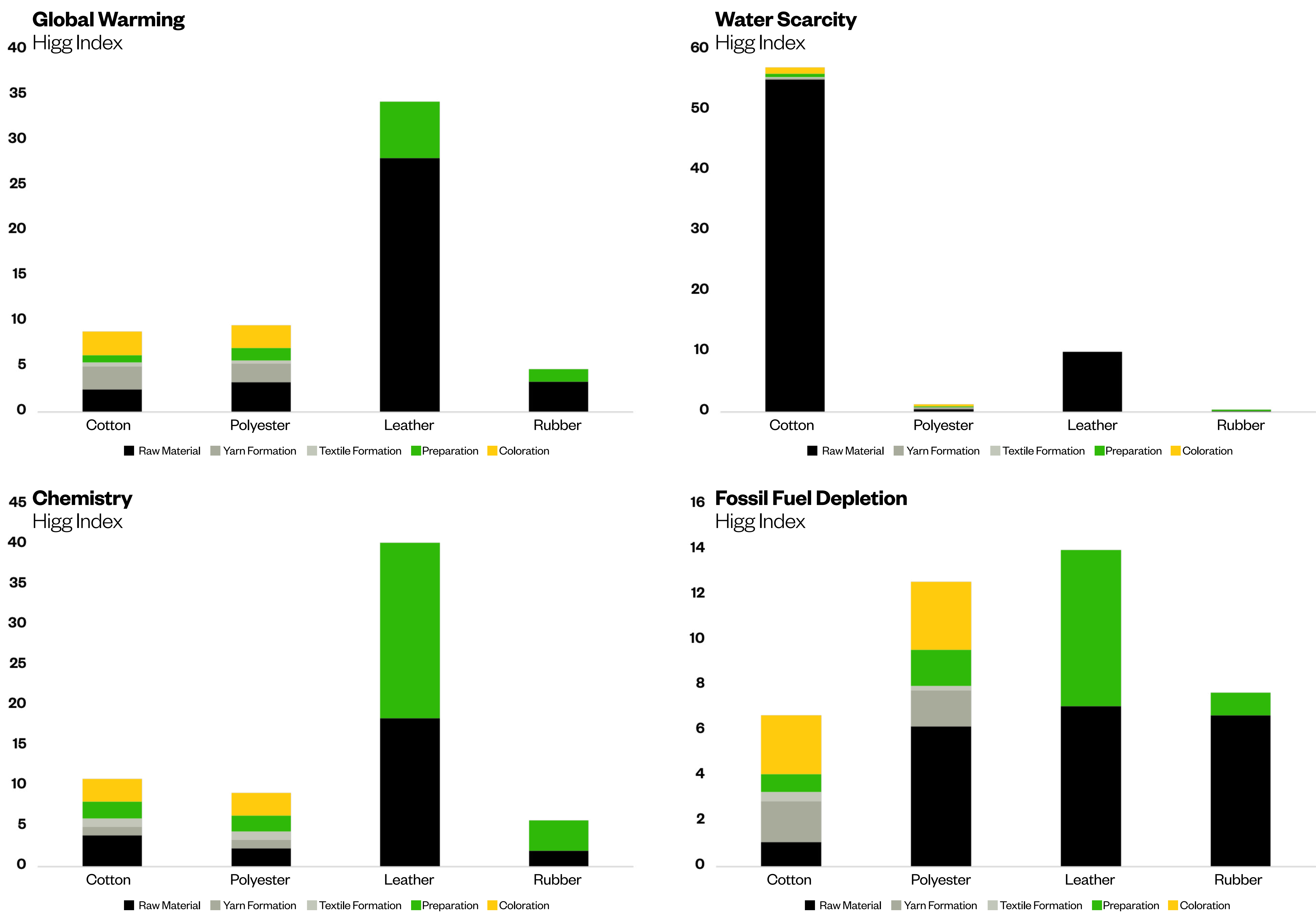




Graph V

## Higg Materials Sustainability Index

Various impacts of the main raw materials in the clothing and footwear industry

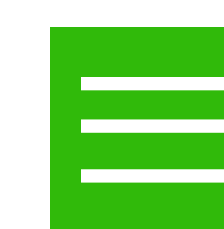


Considering the total impact of the general production process of the two main raw materials, cotton is worse for water usage, while polyester is not good for the depletion of fossil fuels.

It is worth mentioning that the Higg Materials Sustainability Index (Higg MSI) that generated the comparative charts does not include the use and after use of the items. It is an indicator of cradle-to-gate environmental impacts, that is, from extraction/agriculture to when the material is finished, a scope in which most environmental impacts are concentrated, as we will comment later.

Graph V  
Sustainable Apparel Coalition





# Higg Materials Sustainability Index (Higg MSI)

The Higg MSI is a cradle-to-gate assessment tool for leading materials in the footwear and apparel industry. It is based on lifecycle analysis. Nike originally developed the Higg MSI. The Sustainable Apparel Coalition (SAC) adopted it in 2012.

The index generally gives better marks to synthetic materials, and does not incorporate issues such as biodegradability and the release of microplastics in washing, elements that considerably increase the environmental impacts of these materials.

Despite that, the Higg MSI is very important in the industry, as a tool to assess materials in a standardized way up to the manufacturing stage.

SAC has also recently launched (June 2021) the new Higg Product Module, which considers the impacts of product durability, utilization stage, and overproduction waste.



## Other materials

Viscose, linen and silk are examples of other fibers used by the clothing industry, but with less representation in the sector, which is why they are not shown in the table.

here is worth mentioning MMCF category (man-made cellulosic fibers), of which viscose represents 79%<sup>27</sup>. We see interesting alternatives for cellulose fibers in the better fibers class, such as TENCEL™ Lyocell, made by Lenzing, which has properties that are very similar to cotton, but uses a fifth of the planted area, 80% less water and is produced without pesticides or insecticides. There is also TENCEL™ X REFIBRA™, which combines up to 30% of recycled cotton to wood pulp to produce new virgin TENCEL™ Lyocell fibers, helping solve the problem of solid waste<sup>28</sup>.

Another example is Suzano, that recently announced a joint venture with Finnish company Spinnova, which marks its debut in the textile sector. The goal is to manufacture more sustainable fabrics based on cellulose.

<sup>27</sup> Textile Exchange

<sup>28</sup> Data from the [Reformation website](#) (Accessed: 7 June 2021)





# Reformation

## Case Study

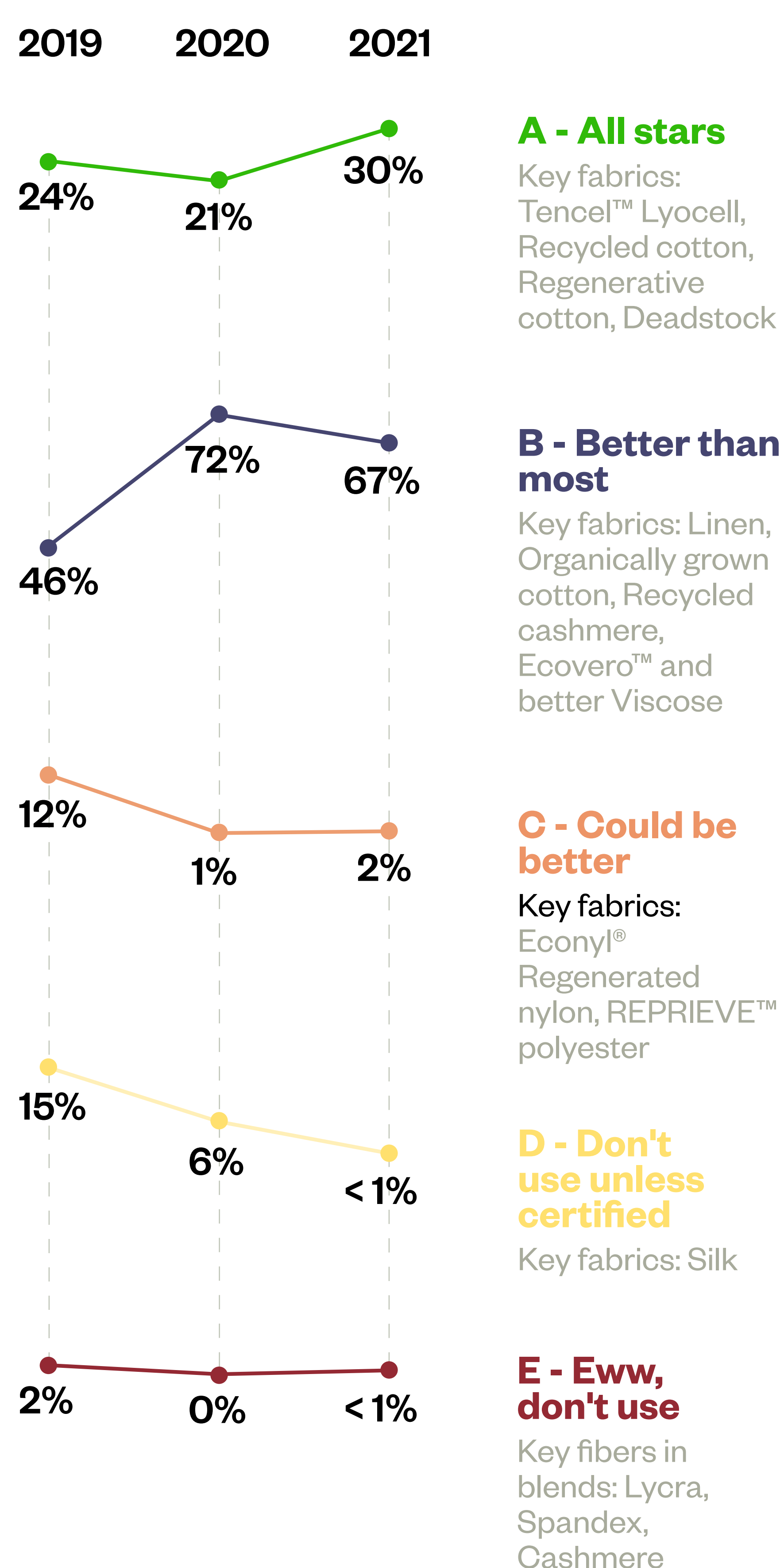
Reformation is a reference in sustainability in the fashion industry. The company publishes a scale of the most used materials in the sector, ranging from A to E, explaining the reasons for the classification. It aims to use 100% A/B materials by 2023.

The company also calculates the environmental footprint and how much it saves compared to traditional clothing purchased in the United States, showing this data for products sold on its website, as in the example below. This type of transparency not only helps the consumer education process, but also allows for more conscious choices and favors the image of the brand.

Graph VI

## Reformation: Fiber Standards

97% of our fabrics meet out A/B ratings



Graph VI  
Reformation Sustainability  
Report 2021 (Accessed: 3  
March 2021)

## Example of the positive impact of a Reformation product:

### Sustainability impact

15.0 lbs. of carbon dioxide savings  
253.0 gal. of water savings  
0.0 lbs. of waste savings

Sustainability made in Los Angeles





## 3.1.3.4.5.6 Processing

The processing of fibers and their transformation into fabric have a wide-ranging environmental impact depending on the raw material. In addition to the rational use of water, energy efficiency is a challenge in the entire production process. The dyeing process of both natural and synthetic raw materials also has a high impact on water resources. Between 17% and 20% of water pollution from industrial activities originates from textile treatment, dyeing and finishing processes, as mentioned above.

In the case of cotton, the greatest emissions are concentrated in fabric processing. This stage uses a large quantity of chemical products, mainly in the dyeing process. There are initiatives, even in Brazil, for the production of colored cotton using seeds with or without genetic modification, but they are at an early stage and need improvement.

The extraction and treatment of leather employs large amounts of water and generates highly toxic waste due to the chemical products used in the cleaning and softening process and, like cotton, in processing, especially in the tanning phase. Today most leather is produced with chromium tanning using Chromium (III), which can oxidize and become Chromium (IV), a toxic compound.

Tanning wastewater may cause various health disorders, including skin problems. An alternative to this process is vegetable tanning, but there are doubts about its economic feasibility and quality when compared to chromium tanning.

Derived from petroleum, polyester tends to have more impact at the extraction stage with regard to climate change. The raw





product is transformed into polymers that are processed into yarns, then quenched with cold air. Water usage is relatively low at this stage and the fiber maintains its quality when recycled.

Finally, synthetic rubber, which is also derived from petroleum, has less impact throughout its processing than polyester. In manufacturing, it uses a process called molding that also avoids waste.

## 3.1.4.5.6 Manufacturing & Transportation

In addition to concentrating water usage in the raw material phase, especially with cotton, the textile industry is heavily dependent on this resource in the washing, dyeing and finishing stages. As an example of the harmful effects of this industry, the Citarum River, in Indonesia, was regarded by environmental NGOs as the most polluted river in the world, largely due to the dumping of waste from textile factories on its banks. In the clothing supply chain manufacturing process, approximately 2,400 substances<sup>29</sup> are used. Chemicals are used in dye preparation, the dye itself and the finishing process.

Another sensitive point at this stage is the waste of fabrics and other materials. To change this into a more conscious utilization also depends on the design, as we saw earlier.

<sup>29</sup> Swedish Chemicals  
Agency (KEMI)





Manufacturing is a stage where there is a great use of long-distance transport as much of the production is concentrated in Asia. Even so, when calculating the impacts of the chain, transportation is not considered a relevant factor, as it is mostly done by sea.

In the case of rubber, waste control can take place in two different ways depending on the production process. In molding, in which the product is placed hot in molds and later is cooled to solidify, possible leftover material is controlled more accurately. In the cutting process, in which solid blocks are cut in a way that is similar to what is done with fabric, the design plays a fundamental role in avoiding leftovers, whose reprocessing is not always considered economically feasible. Companies like Alpargatas, the owner of the Havaianas brand, have invested heavily in reducing waste.

Photo

[Cameron Venti](#) (Unsplash)







## 3.1.5.6 Retail

Like transport, the retail stage is among those with the lowest environmental impact. In this sense, the rational use of energy in stores and the use of packaging (avoiding excess) are the most important issues. On the other hand, it is a very important element in environmental and social matters because of the decisions made and the direct communication with consumers.

Both physical and digital stores may refuse to sell brands or products that do not comply with sustainable practices. This decision has a great impact if made by large store chains. Retail can have a strong influence on consumers in relation to their habits, as we will see in the Governance topic. Stores are also important points in the complex reverse logistics process in favor of recycling or the correct disposal of used items.

With the pandemic, the e-commerce sector considerably increased its share (see [chapter 2](#)) in total sales. Therefore, understanding its impacts has become more relevant. The use of packaging, for example, is a topic that has to be considered. It is possible to find cases in which clothes produced in a sustainable manner are sent to consumers with excess packaging, increasing the total impact of the product.





# Patagonia

## Case Study

Founded in 1973 by sportsman Yvon Chouinard, the outdoor clothing brand Patagonia has harnessed its reputation on more sustainable practices. It is considered a benchmark in sustainability in the industry, offering repair and buy-back programs to promote a circular economy. It has several initiatives to ensure that everything is being done to minimize the negative impacts of its activities to generate positive impacts.

### Environmental Aspects

### Circularity

### Social Aspects

### Economic Aspects

Yvon Chouinard started in the field of equipment for outdoor practices. Five years after it was founded, Chouinard Equipment (the predecessor of Patagonia) had become the largest supplier of climbing equipment in the USA.

However, he also became an environmental villain because his equipment, specifically the pitons<sup>30</sup>, was damaging the rocks. So Chouinard and his partner decided to sell less pitons, which was a high risk for the business. As an alternative, they introduced aluminum chocks that could be wedged by hand instead of sticking in and out of cracks. When they launched the new product, they included a text in the catalog about how to use the new equipment, defending the concept of clean climbing. With this new strategy, the company became even more successful.

With its debut in the apparel business, Patagonia kept its innovative DNA, investing in new materials while creating content and educating its consumers.

As it grew, the company expanded its social perspective. Since 1986, it has donated at least 1% of the sales to local NGOs that fight to save or restore natural habitats.

<sup>30</sup> Pitons are small metal blades with a ring at the end that are fixed with a hammer in cracks in the rocks to provide support and safety for climbers

In 2002, the brand founded the 1% For the Planet global movement to encourage other organizations to practice philanthropy and show how Patagonia incorporates this initiative into its balance sheet.

Regarding materials, the brand searched for raw materials with less impact and started using organic cotton in all the items. Patagonia began experimenting with recycled cotton. Today, up to 64% of the collection uses recycled material. In addition to organic cotton, Patagonia works with other alternative materials such as TENOCEL™, recycled polyester, ECONYL etc. It is one of the pioneer brands in Organic Regenerative Certification. There is transparency in the origin of materials, in the production process, and in the possibility of recycling, considering the complete life cycle of the pieces.

## Patagonia has four medium-term goals:

- **2025:** To be 100% carbon neutral across the entire supply chain.
- **2025:** To have 100% recycled, reclaimed or renewable resources in all products.
- **2025:** To have packaging that is 100% reusable, easily recyclable, or that can be incorporated into home composting systems.
- **2030:** To source 100% Regenerative Organic Certified (ROC) cotton and hemp.





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### Environmental Aspects

### Circularity

### Social Aspects

### Economic Aspects

Patagonia believes that the best way to produce sustainable clothing is to make the items with the highest quality possible. That way they last longer and can be repaired.

**In the words of Yvon Chouinard, “the best jacket for our planet is the one that already exists”.**

In 2012, the brand started a campaign called Worn Wear, with the purpose of extending the life of clothing and equipment through repair, recycling, and the creation of a resale business area in its online store for used items.

Patagonia receives used items in decent condition, which are exchanged for credit (up to \$100) for new purchases. The products are repaired and resold on the Worn Wear website since 2017. For items in poor condition, the company developed the ReCrafted line in 2019, in which they are disassembled and transformed into new quality pieces (upcycled). Finally, the company created the Seconds collection for items that arrive in Patagonia's warehouses with a defect.

The company has more than 70 repair centers around the world, allowing them to repair 100,000 items a year free of charge, as well as mobile stations that travel throughout North America and offer this service at affordable prices for items of any brand<sup>31</sup>. For those who want to make their own repairs, the brand partnered with iFixit and published free repair guides for Patagonia products on its website.

By sharing stories on social media of other people who wore Patagonian clothes and then fixed them, the brand intends to inspire more customers to do the same: repair instead of buying new clothes or wasting clothes that are still in use.

<sup>31</sup> *"Patagonia's Worn Wear Collection Is Saving the Planet"*  
The Manual (Accessed: 3 July 2021)





# Patagonia

## Case Study

Founded in 1973 by sportsman Yvon Chouinard, the outdoor clothing brand Patagonia has harnessed its reputation on more sustainable practices. It is considered a benchmark in sustainability in the industry, offering repair and buy-back programs to promote a circular economy. It has several initiatives to ensure that everything is being done to minimize the negative impacts of its activities to generate positive impacts.

### Environmental Aspects

### Circularity

### Social Aspects

### Economic Aspects

**Patagonia has been making Fair Trade Certified clothes since 2014. The fair trade concept is all about better distribution of earnings throughout the chain and better working conditions. Currently, 82% of the line is certified. The premium paid for the Fair Trade Certified sewn label goes to factory workers who democratically decide how the funds will be used** (cash bonuses, community projects, etc.).

Patagonia is a founding and accredited member of the Fair Labor Association (FLA), a non-profit organization created to make apparel companies operate with responsible labor practices. Working with FLA allowed the company to map and better analyze wage data for outsourced factories. On its website, Patagonia highlights that in 2019, 35% (11 out of 31) of its clothing assembly plants were paying their workers a living wage, on average, as defined by the Global Living Wage Coalition (GLWC), and that they were still trying to understand the extent to which this data was affected by Covid.



# Patagonia

## Case Study

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### Environmental Aspects

### Circularity

### Social Aspects

### Economic Aspects

Patagonia's initiatives make its products very attractive and the company has positive results in a constant growth process. This growth is not based on increasing customer consumption. Its strategy focuses on attracting new customers by offering good quality ethically produced products.

As an example of this business strategy, in the 2011 Black Friday edition of The New York Times, Patagonia published an ad telling viewers not to buy their jacket. The initiative drew attention because it went against the market trend of encouraging sales during the event. After the campaign, sales rose 30%, alongside the work to raise awareness about an increasingly pressing problem, which is the excessive consumption of clothing.

The campaigns of the company usually use a storytelling format, encouraging consumer engagement through the dissemination of information about social and environmental issues. At the same time, the brand manages to raise awareness and add value to its products, becoming more attractive to the consumers, who increasingly seek authenticity and purpose.

# DON'T BUY THIS JACKET



**Patagonia ad on the Black Friday edition of The New York Times (2011)**





## 3.1.6 Use and End of Use (disposal)

The environmental impact of the utilization and disposal of garments bring relevant numbers to the chain, although not too visible because of its fragmentation. In this stage, we have the washing process of the pieces – mainly synthetic – and the disposal in landfills, dumping grounds, or the burning of increasing volumes of clothes and shoes that are no longer used. More than half the pieces (57%) end up in landfills, while about a quarter is incinerated<sup>32</sup>. In landfills, the items continue to emit greenhouse gases and occupy land. Incineration, when carried out effectively (co-processing), can become a source of energy<sup>33</sup>. Currently, most clothing incineration processes involve energy recovery, but as it destroys the product, it does not comply with the principles of circular economy<sup>34</sup>.

**The volume of textile waste is equivalent to one truckload of clothes going to landfills or burned per second.** Due to technological and reverse logistics issues, as we will see below, the clothing industry still has a lot of difficulty to properly dispose of and treat its waste. Only isolated initiatives are found, most of which are still not scalable and at an early stage.

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<sup>32</sup> *Pulse of the Fashion Industry 2017*

<sup>33</sup> Jacobs, M. (2020)

<sup>34</sup> Ellen MacArthur Foundation





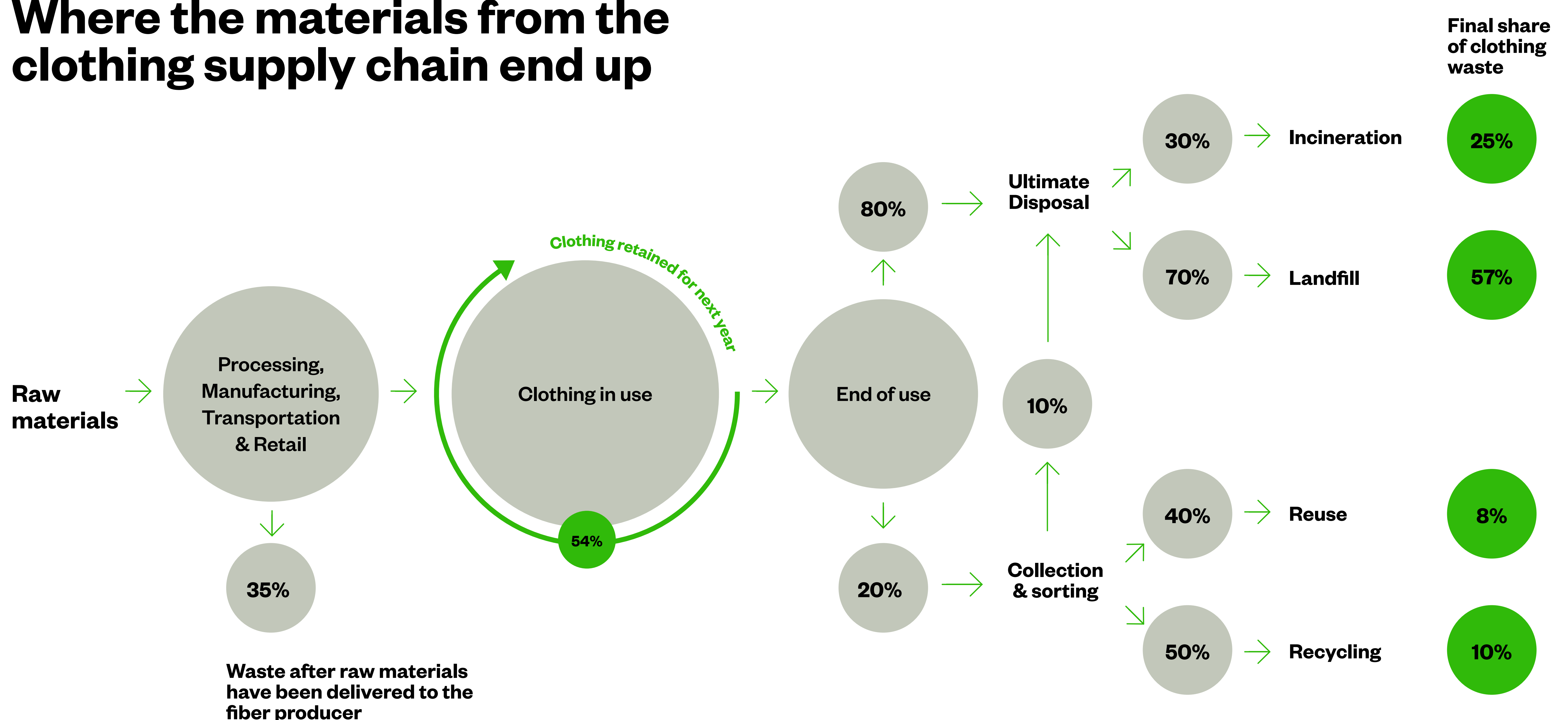
## Disposal

A significant bottleneck for the correct disposal of waste from the apparel industry is reverse logistics. In addition to the logistical difficulty itself, large-scale recycling, especially of mixed fabrics, is still regarded as economically unfeasible. Another relevant element in this stage of the production chain is the excessive number of discarded items, which is a consequence of the increased consumption of pieces per capita globally.

Wasting and discarding materials happen before the items reach consumers. Up to 35% of the material used to produce a garment is discarded and becomes waste in the chain, as shown in the graph below. This process can be mitigated with initiatives such as industrial upcycling, which would imply that leftover materials are reintroduced in the production. There are already successful initiatives in this regard, like the Startup Reverse Resources.

Graph VII

### Where the materials from the clothing supply chain end up



Graph VII  
Pulse of the Fashion  
Industry 2017





As shown in the graph, 82% of textile waste from finished clothes are burned or end up in landfills. Only 10% of the after-use market goes into recycling with a focus mainly on downcycling, a process in which products are recycled into lower value items (such as turning used clothing into mattress pads, floor cloth, or insulation compounds). Less than 1% gives rise to new pieces of clothing, according to data from the Ellen MacArthur Foundation. The transformation of garments into products with the same added value depends on several logistical, economic, and technical factors. The remaining 8% are reused.

Polyester fiber is the one that most manages to maintain its properties in recycling, especially in chemical recycling, whose process has more scalability today. Even so, only 14% of polyester is recycled<sup>35</sup>. In the case of cotton, mechanical recycling reduces the length and, consequently, the quality of the fiber. For this reason, it is necessary to mix recycled cotton with virgin cotton to generate a quality product. Chemical recycling cannot generate a new cotton shirt, but it can generate a new piece from cellulose fibers.

Items with mixed materials are hard to recycle because the technology to separate these materials is still limited. Technological limitations are aggravated by the disposable culture, especially in developed countries, a behavior that can now be found in developing countries as well, like we mentioned above.

## The washing

There is strong environmental impact when clothing items are in the hands of consumers. In the washing process, in addition to the chemical products poured into the water, there is the transport of microplastics. If in the recycling process, polyester is the raw material that achieves the best result, the opposite occurs during washing. Polyester is responsible for releasing millions of tons of these fragments, which end up going up the food chain and can cause health problems even for humans, although there is still no consensus on the long-term effects of these small particles on our health.

Microplastics are particles ranging from five millimeters in size to invisible residue – also called nanoplastics – and are very difficult to detect. They are transported in different ways and reach the oceans, where they account for up to 31% of all the plastic found. The volume of microplastics released into the water by washing clothes per year is equivalent to

<sup>35</sup> Fonte: *Textile Exchange*





50 billion plastic bottles. Thus, clothes are responsible for 35% of the disposal<sup>36</sup> of these particles in a primary source<sup>37</sup>.

## General Picture

The quantitative indicators presented below came from a study that is considered a reference in the industry: the 2018 Measuring Fashion report by Quantis. It uses the life cycle analysis or LCA, a methodology that analyzes the environmental impact associated with the stages of a product. Although the report leaves out a few indicators, such as the impact of usage of the pieces due to high variance, the document is an important guide and one of the most complete studies in the sector.

The studies used in the preparation of this letter showed high variation on the percentage of impact in the consumption and post-use stages, but there is a consensus that the impacts are more concentrated in the initial stages of the process. In relation to greenhouse gas emissions in the apparel

sector, for example, the article Jacobs, Matthew. 2020 shows that 85% occur before the use and after use stage, while in Levi's<sup>®</sup> LCA study for its 501<sup>®</sup> jeans this number is 60%<sup>38</sup>.

When we look at the environmental impact of the production chain as a whole, we can notice that water usage is highest in the raw material stage, but in a broader context, it is not the stage with the greatest impact. Production, which comprises the processing of yarn, fabric, and the manufacture of the pieces, is where we find the most significant impact. In particular, charcoal and natural gas are used as energy sources in the dyeing and finishing processes, which represent 60 and 70% of emissions in the initial stage of production. This happens because a great deal of the initial production process happens in countries that make extensive use of these energy matrices. The table below shows the impact in four pillars: emissions, water use, human health, and impact on the ecosystem.

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<sup>36</sup> Boucher, J. and Friot, D. (2017) and Ellen MacArthur Foundation

<sup>37</sup> Microplastics are divided into two sources of origin: primary and secondary. Primary sources are those in which the residue already enters the environment in the form of microplastic, as a result of the washing process. Secondary sources are those in which microplastic is generated from the wear of larger items like plastic bottles.

<sup>38</sup> Jacobs, Matthew. 2020, and THE LIFE CYCLE OF JEANS Understanding the environmental impact of a pair of Levi's<sup>®</sup> 501<sup>®</sup> jeans



Graph VIII

Impact by production stage  
(clothing)

Production Stage	Raw Material	Yarn Preparation	Fabric Production	Dyeing and Finishing	Assembly	Transport
GHG emissions	15%	28%	12%	36%	7%	1%
Water use	31%	23%	11%	27%	8%	0%
Human health <sup>39</sup>	21%	26%	11%	32%	7%	1%
Ecosystem <sup>40</sup>	30%	21%	9%	30%	9%	1%

Graph IX

Qualitative comparison between materials  
(clothing and shoes)

Natural Material			Synthetic Material		
	Pros	Cons		Pros	Cons
Cotton	Biodegradable	High use of water and chemicals, fibers lose quality in recycling	Polyester	Less water use, recyclable fibers without loss of quality	Not biodegradable, releases micro fibers throughout life cycle
Leather	High durability	High use of water, energy and chemicals	Synthetic Rubber	Difficult to replace properties, overall lower impact	Not biodegradable, releases chemical residue when decomposed

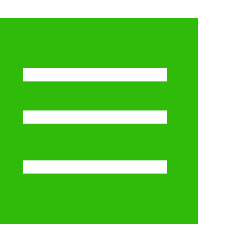
<sup>39</sup> To measure the impact on human health, the unit Disability Adjusted Life-Years (DALYs) is used, which expresses the number of years lost due to health problems, disability, or premature death

<sup>40</sup> Contributions to the extinction of species through the removal of forests, contamination of areas and related factors are considered impact on the ecosystem. The unit used here is the Potentially Disappeared Fraction (PDF) of land per square meter per year (PDF \* m² \* y).

Graph VIII  
Measuring Fashion 2018 by Quantis

Graph IX  
Based on market studies and proprietary analysis





When comparing raw materials, leather is by far the most harmful material to the environment. In addition, there is an ethical debate regarding their production system that rarely pays attention to animal welfare. Traditional cotton also has a clear impact on the use of water and chemicals. Polyester, on the other hand, is responsible for a high percentage of emissions in the sector, using non-renewable resources. The release of microplastics by polyester during washing is also a high impact factor, even though it is difficult to be incorporated in the life cycle analysis. Finally, synthetic rubber is one of the materials with the least impact. Despite being sourced from non-renewable material, it can be recycled.

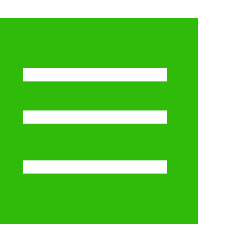
It is worth emphasizing that each material has its usefulness and suitability for the design. For this reason, it is not always possible to make choices between different materials when designing a garment. The experts' recommendation is that decisions be made based on what is most sustainable within each class. If the garment is intended to be made of cotton, the most sustainable cotton must be chosen. If the design is for leather, the most sustainable origin and processing leather should be used, since many efforts have been made to improve production processes.

## The Shoe Industry

**Shoes consume 26% of the materials available to the fashion industry, accounting for 16 to 32% of the environmental impact. This value varies depending on the indicator used. In the Quantis report, shoes are divided into 3 groups: synthetics (57%), leather (25%) and textile-based shoes (18%).**

Regarding the environmental impact, synthetic shoes are the biggest responsible for emissions, water use and human health impacts, in part because they represent the majority of shoes produced. Regarding the ecosystem, leather shoes are responsible for 82% of the total impact of the footwear sector, even with their smaller market share compared to shoes made from synthetic materials. It is noteworthy that, even though it is considered a by-product of the meat industry, leather production presents a problem similar to that of cotton in relation to deforestation and its consequences.





# 3.2.3. Social Challenges

For a long time, the clothing supply chain has a challenge regarding human capital, and more specifically, job security, remuneration and labor rights. Several brands have already had their names associated with modern slave labor due to flagrant practices of this type in suppliers and other agents in their production chains. The concentration of social challenges is mainly in the manufacturing and processing stages, considering that part of this process is often outsourced (or even further outsourced by these outsourced companies). It is common for brands to use manufacturing services around the world.

These services are heavily concentrated in Asia, and in many countries they are difficult to monitor. According to the ILO - International Labor Organization - in countries such as Bangladesh, India and Cambodia, informal activity exceeds 80%, and these countries are relevant in the manufacturing process<sup>41</sup>. In the raw material stage, labor problems are also encountered, especially those of agricultural origin.

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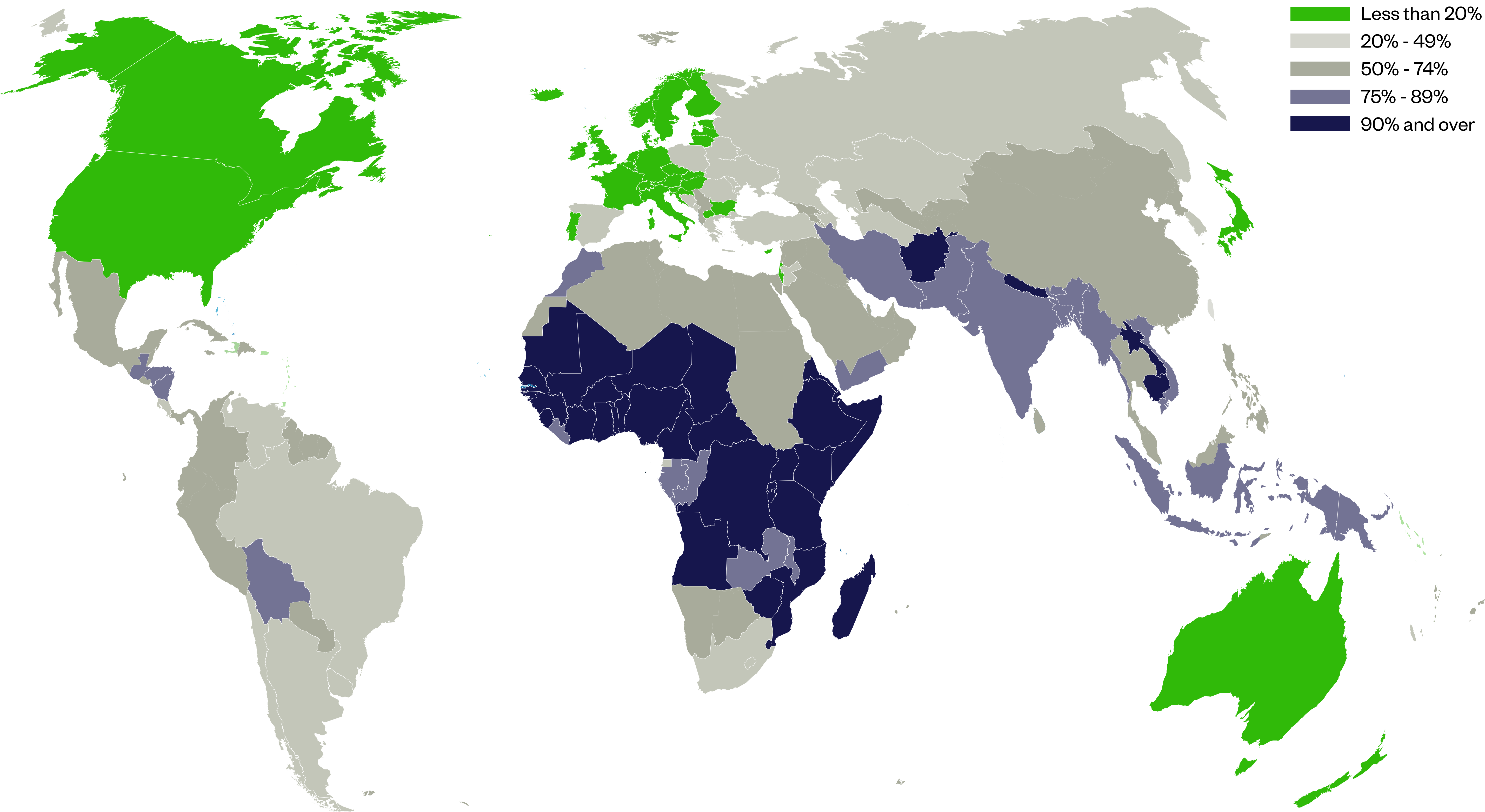
<sup>41</sup> Women and men in the informal economy: a statistical picture, ILO 2018





Graph X

Share of informal employment in total employment (2016)



These are countries with weak or virtually non-existent labor legislation, and many places do not allow audits by the brands. In addition to the impediment to inspection, the geographic extension, the fragmentation of the chain and the short terms of production cycles make effective actions with these suppliers difficult.

About 80% of the garment industry's manufacturing workforce is made up of women. They are involved in sewing, embroidery, printing, accessories and trimming processes. In contrast, female representation in leadership positions is extremely low.

Graph X  
2018 ILO study *Women and men in the informal economy: a statistical picture with data from 2016*

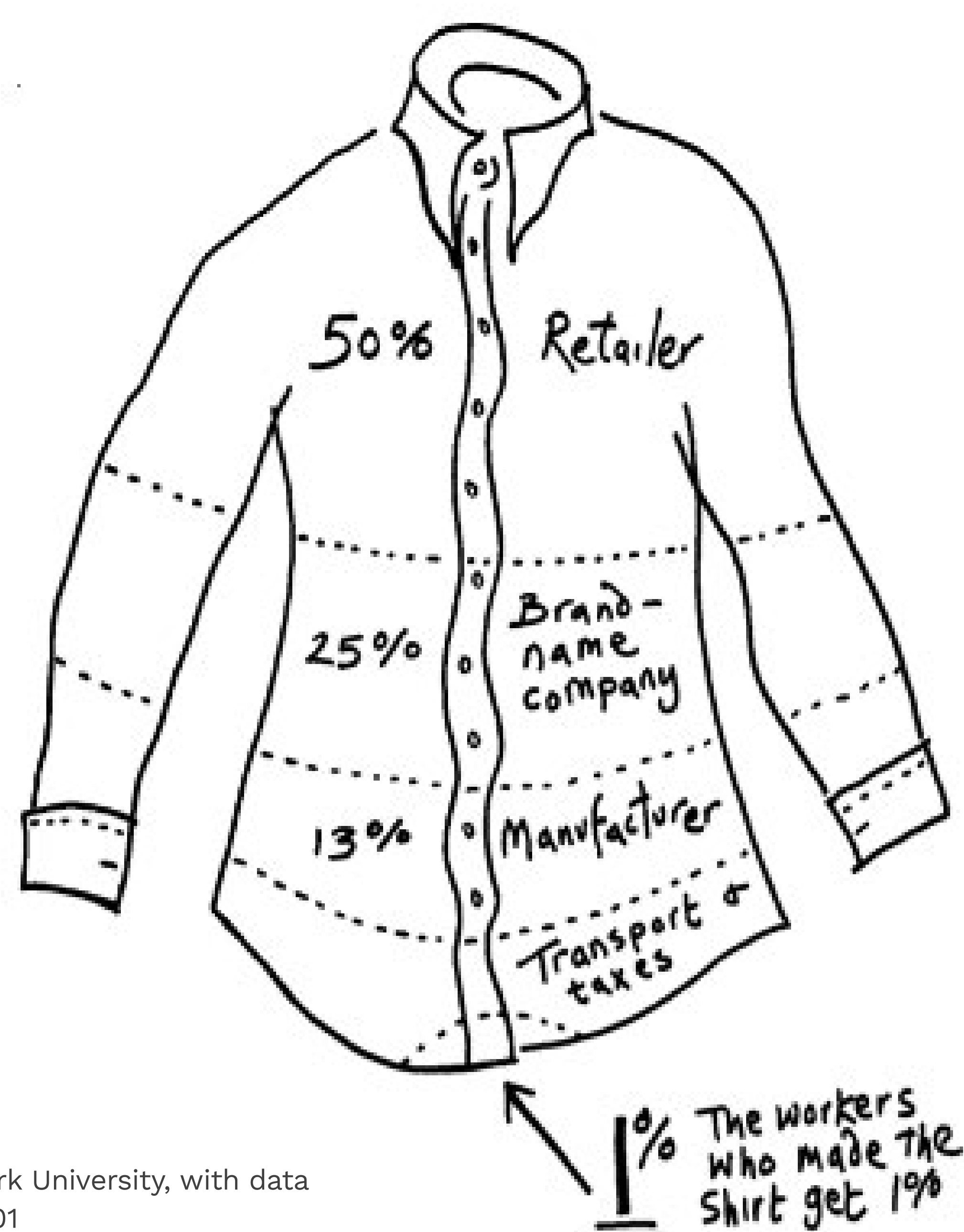


In addition to ILO reports, reports of labor issues in the clothing chain periodically feature in the traditional media. In recent years, these accusations have gained space on social media. The need for a policy with more transparency and direct communication between brands and the public are elements to be considered in the structure of corporate governance.

As shown in the graph, the distribution of values within the chain reinforces the problem of low wages. It is estimated that only 1% of the value of a shirt reaches the hands of the worker who makes it. The percentages in the distribution of the chain generate one of the biggest criticisms made to brands. Most of the discussion about living wage costs focuses on the additional cost per item that would be paid by final consumers, which is directly affected by the division of earnings in the chain and the mark-ups between production phases. With this compounding price escalation structure, the imbalance in remuneration will hardly be resolved.

Graph XI

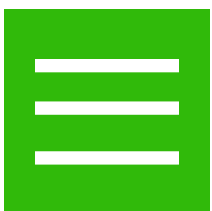
## T-Shirt Price Breakdown



Graph XI

Garment Industry Supply Chains – York University, with data from Textile Outlook International 2001

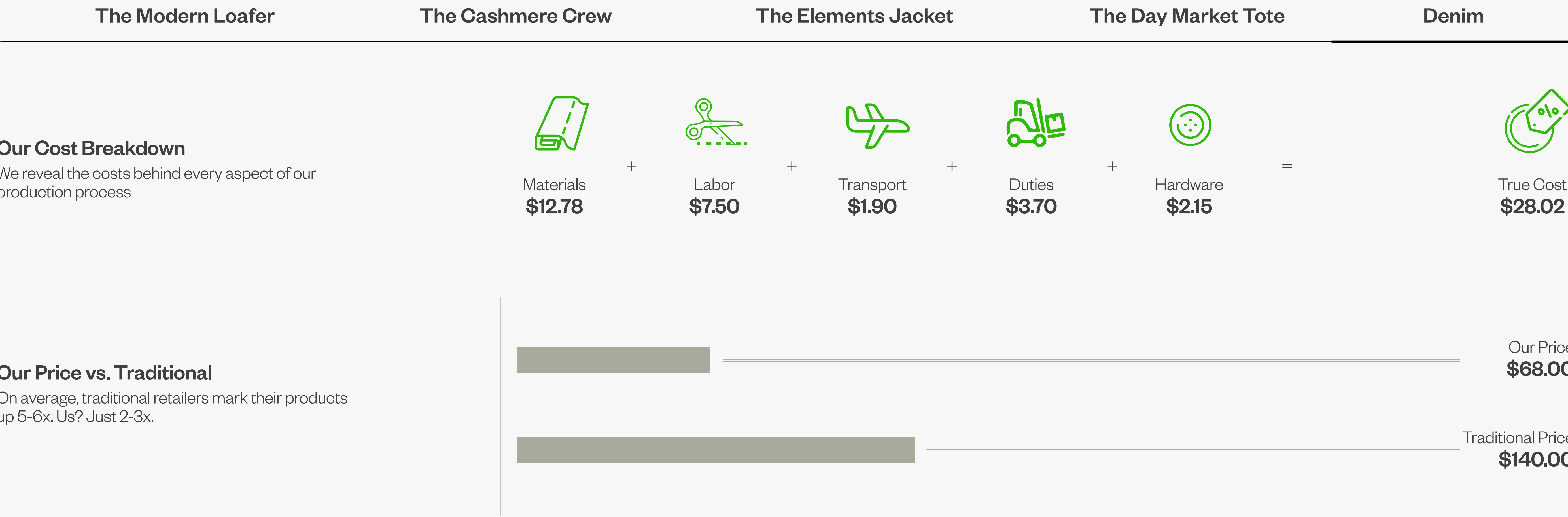




# Everlane

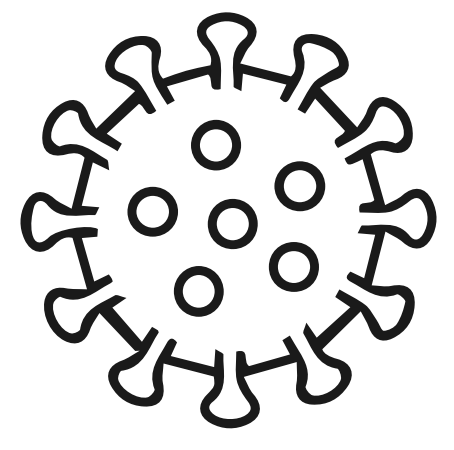
## Case Study

Everlane is another reference for the industry. In addition to ambitious environmental goals, such as the one launched in 2018 with the purpose of eliminating all virgin plastic from the supply chain by 2021, the brand sets an example in practices such as: transparency in the cost structure, in the mark-up of its products (see figure), and in the relationship it develops with suppliers. On its website, the company publishes detailed information about its suppliers, materials used and how the supply process took place, as well as images of the supplier.



Graph XI  
Everlane (Accessed: 3 July 2021)





## Pandemic

Since the beginning of the pandemic, sensitive labor relations and the economic impact on the weakest links of the chain have worsened with the drop in sales. The sector is already aware of the need to review inequalities in this process, while consumer demand for products that respect the environment and fair trade rules is growing, especially in younger generations.

The 21st century consumer tends to question, for example, how the clothes he or she is buying can be so cheap, which calls for a new look at the governance of companies in the sector. Remembering that the distrust generated by very cheap prices does not mean that more expensive pieces are automatically included in more sustainable practices.

The crisis resulting from the pandemic drew even more attention to the sector's imbalances, such as the brands' lack of long-term alignment with their supply chain. In the first few months, several retailers canceled orders, including those that had already been manufactured, leaving many suppliers fragile. When the economy reopened, the sector was out of stock. The brands that sat down with their suppliers to negotiate on reasonable terms strengthened their relationships with the entities in the chain.





# 3.3

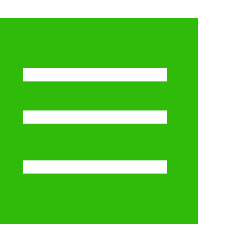
## Governance Challenges

Analyzing and reviewing aspects of the business model and corporate practices in order to reduce social and environmental impacts without compromising the financial health of brands is a major challenge for the apparel industry. If, on the one hand, consumer awareness is growing, on the other, the demand for low-cost products with a fast production cycle is still high, which is illustrated by the recent phenomenon of the Chinese Shein in younger generations. There are several possibilities to consider as we will see in [chapter 4](#).

Governance issues encompass internal processes and extend to the relationship with suppliers as well as with consumers. The demand for transparency grows in a scenario where the public is increasingly empowered to question - and even compromise - a brand's reputation through social media. The monitoring (social listening) of this relationship and the constant feedback to the consumer, regardless of the matter being discussed, are important elements in the business strategy and brand management.

These aspects go far beyond advertising and the relationship with influencers. Looking at these issues cannot be left in the hands of a single department. It needs to be linked to the Executive Board and be part of the





company's culture as a whole. If the brand's design team is not engaged, for example, the work of the Sustainability area will be much more limited.

It is possible to highlight initiatives by major brands looking at ESG values as business drivers, such as the examples mentioned here. Among them, Patagonia, which placed sustainability as a pillar of all stages of its chain or of consolidated brands, and Nike, which, in addition to reviewing the weight of social and environmental issues in its business model, created a structured index of measurement and verification.

## Nike reviews processes and increases the weight of sustainability in the chain

Among the companies that are seeking to increasingly implement ESG practices in their businesses is Nike, which has already suffered from several problems throughout its chain, mainly in social aspects. Working on the pull model for improving its chain, in 2009 Nike launched the Rewire project, which, among other initiatives, adapted its audits to give equal weight to its suppliers' sustainability, cost, quality, and punctuality.

They were divided into five categories: gold, silver, bronze, yellow, and red. Those who fit the first three levels are classified as priority in ordering

and scheduling. And they receive support from the company to improve their practices and optimize the management of resources and waste. Those classified as red or yellow have six months to adapt to Nike's rules if they want to remain its suppliers.

The company also created a tool to measure impact such as water use and influence on climate change. This tool was donated to the Sustainable Apparel Coalition in 2012, and has become the Higg Materials Sustainability Index (Higg MSI), discussed here.





On social issues, several brands have already considered changing their policy with suppliers, especially in the manufacturing stage, nationalizing the supply chain, which is also a strategy of shortening the production lead time and mitigating risks, as we saw in the pandemic. Local production has several benefits, such as stimulating job creation in the country where it operates and facilitating inspection. If, on the one hand, these measures could make the process more efficient and sustainable, both socially and in terms of transport, on the other, the global impact of changes like this on the economy of several countries could be devastating, especially in Asia.

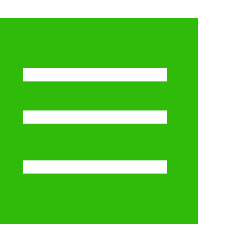
Asian countries are responsible for just over 60% of ready-made clothing exports, with China as the main producer, followed by Vietnam. Regarding the representativeness of this market in the countries' economy, approximately 75% of Bangladesh's exports and 45% of Cambodia's exports come from activities related to the finishing of garments and shoes (with a weight of around 10% and 35% in their respective GDPs)<sup>42</sup>. Relocating the chain can have very strong social impacts on the economy of these countries, even if wages and working conditions are far below the level of dignity. Aware of this impact, some companies tried, even during the pandemic, to maintain a minimum order demand. The intention was to maintain the financial health of its suppliers, but this was not the behavior of the market as a whole. In Southeast Asia, workers received 38% less wages during the pandemic<sup>43</sup>.

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<sup>42</sup> UN Comtrade, World Bank, WTO and World Footwear Yearbook 2019

<sup>43</sup> *Un(der)paid in the Pandemic*, Clean Clothes Campaign





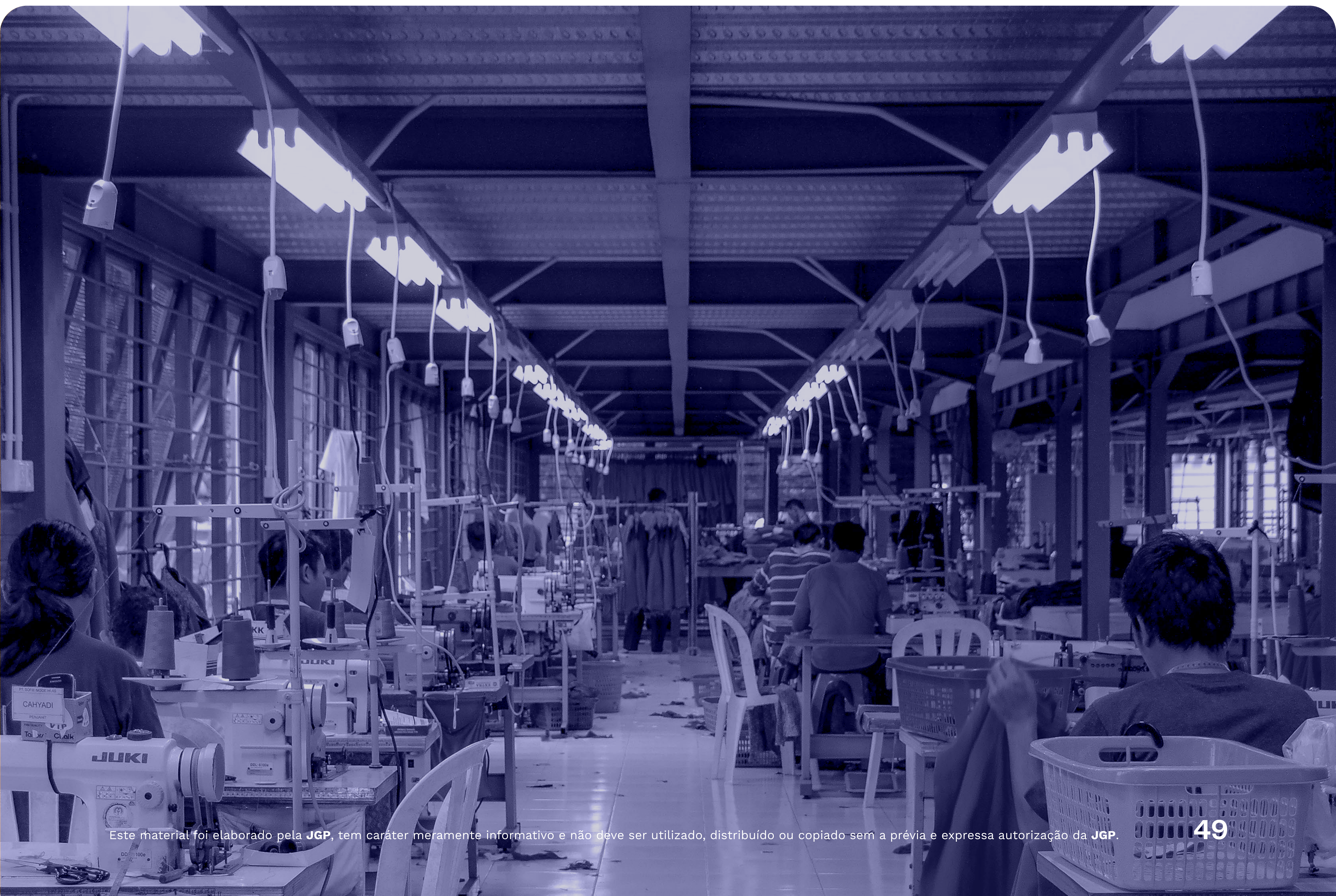
For retail, the biggest challenge in relation to Governance is in the relationship with suppliers, customers, and employees and perhaps even in its business model, as we will see in [chapter 4](#).

Changing the consumer's perception may be the key element to drive the main changes in the chain, which today applies a business model that has often been worn out and unsustainable. For publicly traded companies, the demand from shareholders and the interest of investors in other types of structuring, as we will see in [chapter 4](#), can be encouraging elements for the revision of the system.

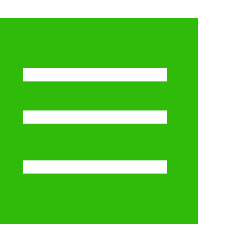
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**Photo**

Rio Lecatompessy (Unsplash)







## 4.1.2

# Fashion Industry Perspectives

According to the Circle Economy's Circularity Gap Report 2019 (a group dedicated to study the circular economy supported by the UN), released in the Davos Forum last year, only 9% of the global economy managed to join the circular economy process. In approximate numbers, we are talking about almost 90 million tons of material with potential for use being wasted.

While fashion seeks to find solutions to enter the circular economy on a large scale using its traditional structure, new business models have emerged with a focus on the reuse.





## Cradle to Cradle Line (C2C)

### C&A

In 2017, C&A was the first retailer to have a gold level product with C2C (cradle to cradle) certification. To receive the certification, products are evaluated for their use of chemicals, reuse of materials, emissions, water management, and social justice. The lowest score achieved among these items will determine the overall level of certification<sup>44</sup>.

In the C2C model, materials fall into "biological" and "technical" cycles. The biological at the end of use can be discarded in the soil, serving as food for small animals without causing damage, while the ones in the technical cycle do not release toxic substances and can be recycled without losing quality. Each material follows its own cycle within the so-called regenerative economy.



## High performance circular design

### Adidas

In 2019, Adidas launched a 100% recyclable high-performance shoe with programmed reverse logistics: the Futurecraft.Looped. According to brand reports, the material can be reused several times without a drop in quality.

To arrive at this product, the company needed to innovate in its manufacturing process, such as eliminating the use of any type of glue, working only with sewing and modeling processes, and using only one type of material. After being used and returned to Adidas, and going through an industrial washing process, the shoes are melted and molded with minimal use of virgin material.

<sup>44</sup> <https://www.c2ccertified.org/get-certified/product-certification> (Accessed: 3 July 2021)

Images: ©C&A and ©Adidas



The sale of used items still faces some resistance from the population, despite the new perspective of consumers in the 21st century. The clothing rental itself is more focused on models for special occasions, such as graduations or weddings. But there are signs that this culture may change.

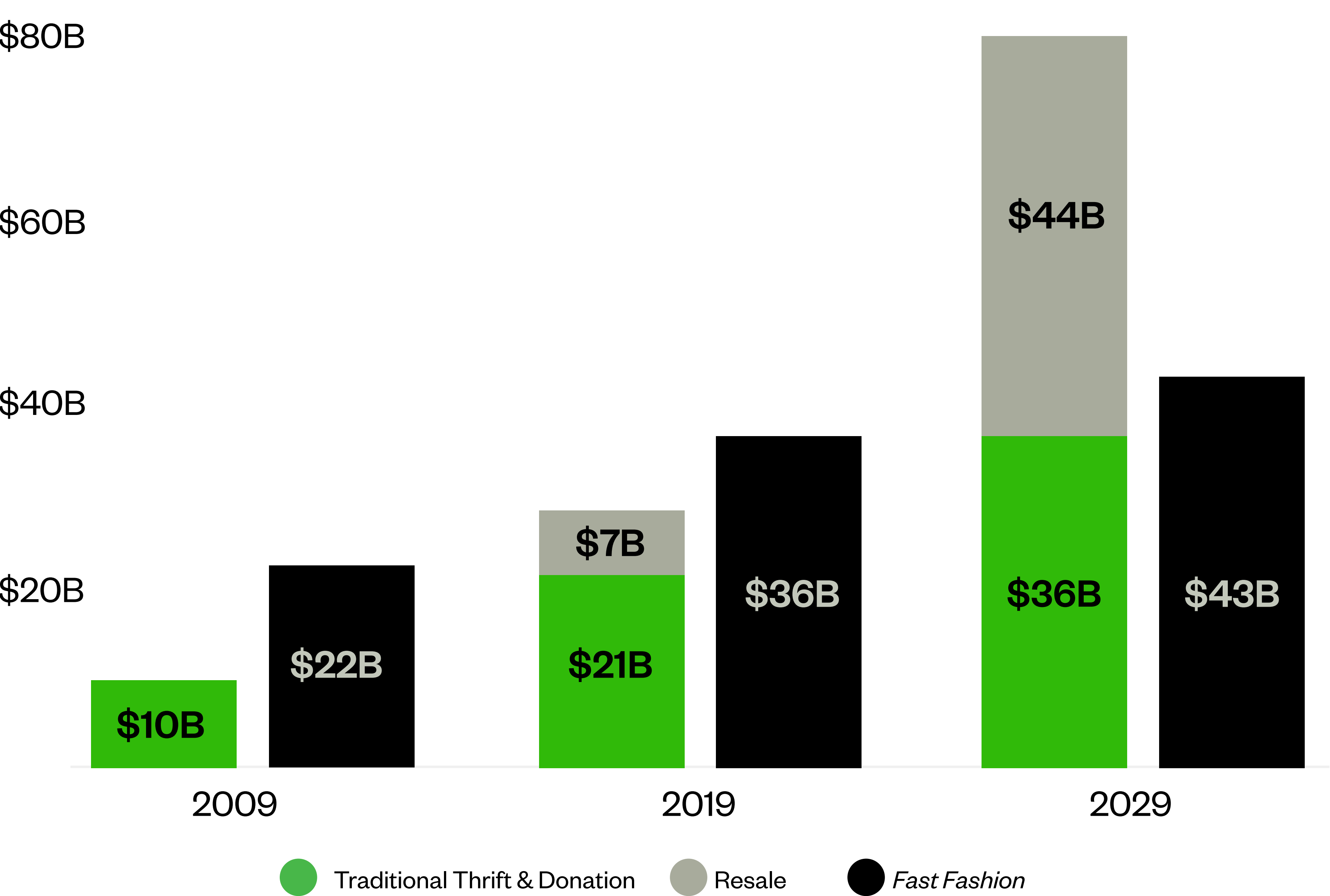
Expectations are positive for the next decade. The resale of used pieces should surpass fast fashion (graphic) according to the ThredUp Resale Report 2020, which also points to other relevant changes until the end of the decade. Companies in the retail sector, such as Enjoei in Brazil and Poshmark in the United States, have been attracting the interest of investors amid these greater circularity trends.

Graph XII

**Estimates and Projections for the Fashion Industry**

**Resale Expected to be bigger than fast Fashion by 2029**

Total secondhand market projected to grow to almost twice the size of fast fashion by 2029



Graph XII  
ThredUp Resale Report 2020 and WRAP Textiles Market  
Situation Report 2019



Meet the closet of the future

- Secondhand**  
(thredUP, Plato's Closet)
- Rental**  
(Rent the Runway, Le Tate)
- Subscription**  
(Stitch Fix, Trunk Club)
- Amazon Fashion**
- Direct to Consumer**  
(Everlane, Allbirds)
- Off-Price**  
(Marshalls, TJ Maxx)
- Fast Fashion**  
(Zara, H&M)
- Mid-Priced**  
(Gap, J. Crew)
- Value Chains**  
(Target, Walmart)
- Dept. Stores**  
(Macy's, Nordstrom)
- Other**  
(Costco, QVC)

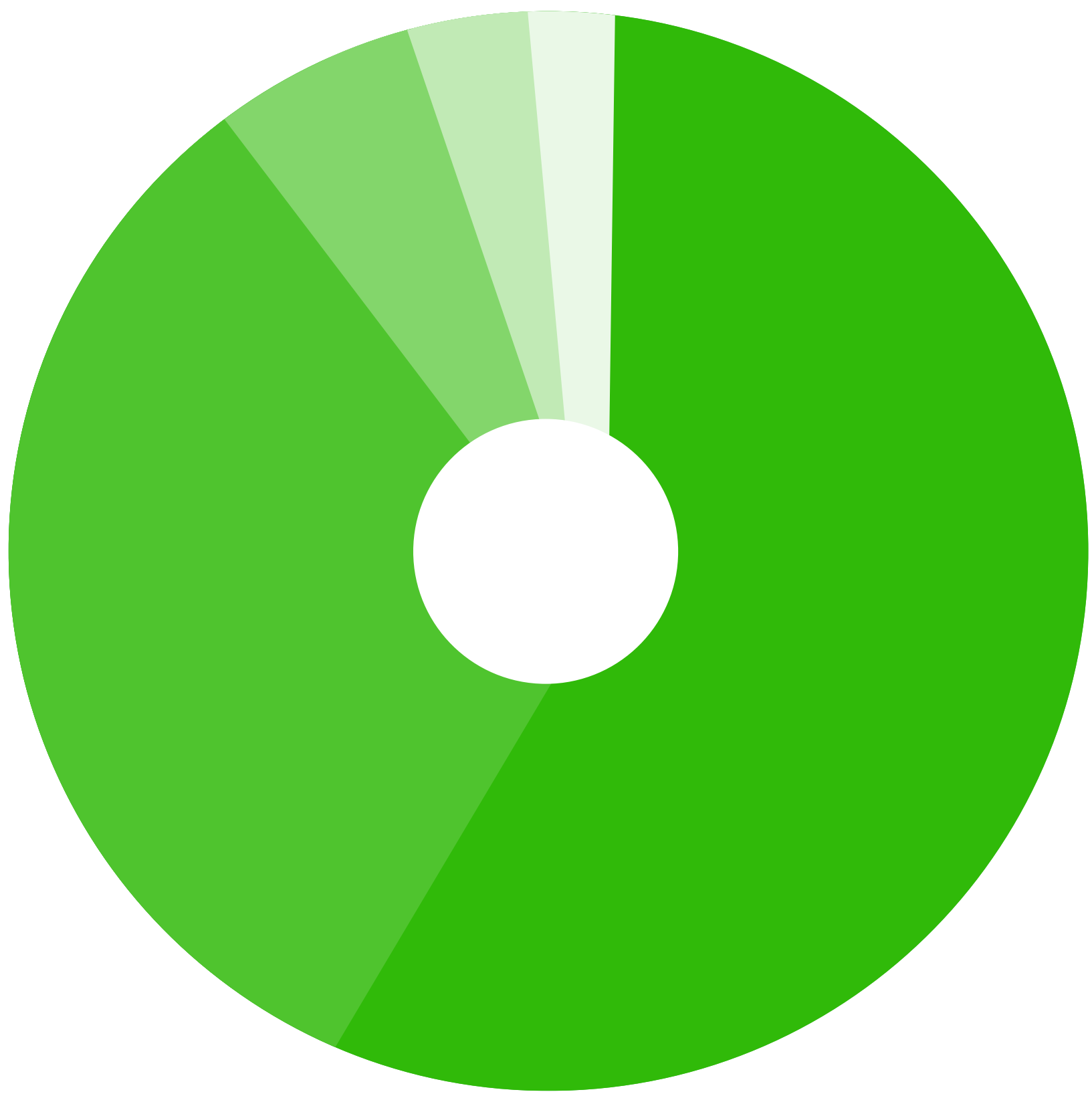


**Secondhand** expected to claim the second largest share of market after off-price.

The top 3 fastest growing sectors are **secondhand**, **rental**, and **subscription**.

**Mid-priced specialty** and **value chains** expected to lose market share.

The fate of UK used textiles collected for re-use and recycling



Exported	60%
Re-use-sold through charity shops	31%
Waste	5%
Recycling	3%
Re-use-sold through second-hand commercial outlets	2%

It is important to consider that the behavior regarding the use and sale of used clothing varies according to culture. In the United States and the United Kingdom, the used clothing export market is relevant. Out of the used items collected in the UK, 60% are exported and 31% are sold at local bazaars and charity events. The percentage sold in

Graph XII  
ThredUp Resale Report 2020 and WRAP Textiles Market Situation Report 2019





outlets is 2%, while 3% is recycled and only 5% is thrown in the trash<sup>45</sup>. The biggest obstacles to this growth are in emerging countries, as shown in [chapters 2](#) and [3](#) of this letter. Out of the percentage of clothes exported, the vast majority is destined for Africa.

Second-hand items coming mainly from Europe and the United States represent more than 50% of the clothing shopping market in some places in Africa. This process divides opinions among industry analysts. If, on the one hand, this shipment can lead the local population to have access to quality items that they would hardly be able to buy, on the other hand, the scaled process could harm the development of the local textile industry.

## 4.1.2. Recycling of Pieces

In general terms, post-consumer recycling – the best known type – can be divided into mechanical and chemical. Chemical recycling is less used because it is still underdeveloped and more expensive (it is more advanced for polyester), but the market already envisions other types of initiatives. Reverse Resources, for example, is a platform that works as a marketplace for fabric leftovers.

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<sup>45</sup> Textiles Market Situation Report 2019 by WRAP



Whoever has spare material is connected to whoever can buy it. These leftovers go to internal parts of products such as cushions and the like, fixtures added to clothes, or as items with design based on patchwork, for example.

The table shows the main types of recycling and the biggest challenges and encouraging initiatives of the industry

Graph XIII

**Diversity and challenges of recycling clothes and shoes**

Types of Recycling	Process	Challenges	Encouraging Initiatives
Industrial Recycling	Pieces of fabric are used to make parts of new garments.	It is already used in some scale in the industry, but there is a challenge of mapping the leftovers in the chain.	The startup Reverse Resources created a system to organize this type of recycling.
Yarn Recycling	Used yarn is shredded to make new clothes.	It is only possible for specific clothes and mesh that can be "unknitted".	Italian company Benetton created a sweater that uses only 1 yarn of 450m with Japanese technology.
Fiber Recycling	Clothes are shredded and processed back into fibers.	Can be heavily used for mechanical cotton recycling, but it causes loss of fiber quality.	Companies like 3C Filati are increasing the amount of recycled materials in new fabrics.
Polymer Recycling	Mechanical recycling of polymers is carried out through melting and extrusion of mono-material plastic-based textiles.	Only works for mono-material plastic fibers (few fabrics are pure).	The company Dutch Awearness developed a technology to allow successive recyclings of the same material but not in scale.
	Chemical polymer recycling dissolves textiles with chemicals and can be applied to polyester, cotton and other cellulose fibers.	There are still no consolidated solutions that provide scale for the recycling of mixed fibers.	The H&M Foundation in partnership with the Hong Kong Research Institute for Textiles and Apparel developed a process to separate and recover polycotton into virgin equivalent polyester and a cellulose pulp.
Chemical Monomer Recycling	Polymers such as polyester and nylon can be depolymerized to individual monomers.	Still not economically feasible because separating monomers from dyes and other substances is expensive and uses a lot of energy.	Ioniq developed a process to recycle different types of PET and polyester fabrics that could cost the same as virgin material.

**Graph XII**  
Based on the study *A new textiles economy* by the Ellen MacArthur Foundation in addition to proprietary analysis



Based on initiatives such as the examples given here, the sector begins to find solutions for its gaps. Some brands even design bolder models for part of their business, such as the creation of a subscription model for clothes in which consumers would pay a monthly fee that entitles them to borrow clothes (see summary table of initiatives based on information from the Ellen MacArthur Foundation).

Graph XIV

**Examples of sustainable business models in the apparel sector**

Model	Description	Brands
Subscription Model	Consumers pay a monthly fee to have clothing on loan.	YCloset, Kleiderei, Gwynnie Bee, Le Tote
Rental	Customers rent garments for specific occasions.	Tulerie, Rent the Runway, Rentez-Vous
Less Impact Fashion	Choice of high quality clothing produced with minimal social and environmental impact	Patagonia, The North Face, Reformation, Allbirds, Eileen Fisher, Malwee
Second Hand	Purchase of used clothing	ThredUp, Enjoei, Troc, Plato's Closet, Repassa
Repair and Renovation	DIY clothing repair or as a third-party service and upcycling	Jack Wolfskin, Patagonia, Salewa, iFixit, Clothes Doctor, Junky Styling
Take Back Systems	Brands receive used clothes and in return they grant discounts or incentives that do not promote further consumption	Inditex, Houdini, C&A, H&M

**Graph XIV**  
Based on the study *A new textiles economy* by the Ellen MacArthur Foundation in addition to proprietary analysis





And why are the projections for the second-hand market and recycling so positive in view of such a complex behavioral change scenario, especially in the large consumer segment that are emerging countries?

Because leftover clothing (mostly in the closets of the consumer) can encourage initiatives in this sector of the economy, with the emergence of new businesses of all sizes and in all parts of the world. A survey carried out by the German company Movinga showed that in Europe and the Americas people use only 20% to 40% of the pieces they have in the closet in one year.

In countries like Italy, the United States, and Belgium, more than 80% of the items do not come out of the closet during the year, while in Brazil this number is 76%. It means capital literally stored in the back of the drawer. New business models have increasingly allowed people to monetize these assets, often unnoticed.

Another point that the sector needs to review is the transparency in communication with consumers, showing the origins of the raw material and the production cycles, as mentioned in the Governance item in [chapter 3](#). There are proposals for clothing to have labels as detailed as food product labels, including seals and certifications. Brands such as Patagonia, MUD Jeans, and H&M have already adopted initiatives like this.





# 4.2 New Technologies

In addition to being aware of the need to review the processes and many of the relationships along the chain, the clothing sector is looking at new technologies and new business models. Innovative models are being tested as we have just seen, while others will depend on considerable changes in technology, processes, and habits. One of the possibilities considered is the use of 3D technology in clothing manufacturing. There are already initiatives like Made for You, marketed on Amazon.

This technology brings several elements that contribute to increasing the sustainability of the sector, but it also poses risks, as we will see below.

## **Value added by 3D technology in clothing:**

- Manufacturing of clothes tailored to each consumer
- Production based on demand, avoids unnecessary inventory
- Reduction of waste of fabric and other materials
- Reduced inventory, transportation and delivery time costs

On the other hand, if implemented on a large scale without educating the consumers, what we call instant fashion could become the villain by stimulating the excessive consumption of clothing. It is also necessary to think about the automation of the sector and the consequences for the workers. The use on a large scale without offering alternatives to this





huge unskilled workforce can have very serious economic and social consequences, and compromise some Asian economies.

*Fashion as a Service* is another option that can gain relevance in the market. This model transforms the current business environment, based on the offer of products, into a provision of services along the lines of Uber and Airbnb, replacing the logic of ownership with that of access. Going beyond the predictions, there would be a kind of "universal wardrobe" traceable to the origin and state of each item, which could be requested as needed. The huge logistical challenges have not yet allowed for major advances in this process.

There are studies focused on smart fashion that focuses on the production of clothes that adapt to the environment, with changes in color and texture according to the characteristics of the place, bringing more usefulness to the same piece.

Artificial intelligence and the internet of things are technologies to solve the problem of traceability in these innovative business models.

Regarding new fabric, research is aimed at finding materials with equal or superior quality to traditional ones and lower environmental impact, as shown by the examples explored in the text. Finally, there are also efforts to make recycling more scalable, and to overcome barriers such as mixed fabric recycling and material separation, which would have the potential to unlock circularity in the sector.





# H&M

## Case Study

Unlike brands that focus on sustainable fashion, H&M has been trying to adapt its business model that imposes several obstacles to sustainability, leading more sustainable, responsible, and circular practices in fast fashion.

As one of the largest fashion retailers in the world, the H&M Group has a strong ability to

influence the global industry and encourage the development of new technologies. The Swedish company was founded in 1947 and grew rapidly in the 1990s, helping shape fast fashion itself. Since then, the company has been taking important steps to become more environmentally responsible and act in favor of social issues in the sector.

### Pioneering

H&M seeks to lead the change toward a more sustainable future in the fashion world, with investments in different fronts of innovation and transformative technologies that can be used at scale. Through its innovation laboratory, the brand has promoted the development of new sustainable retail technologies, innovation and technical tools for the fashion industry. In addition to the aforementioned initiatives, the company is exploring 3D technology and artificial intelligence to lower the environmental impact, reducing the amount of materials used.

To prepare for large-scale recycling, the retailer has partnered with Renewcell, which will supply Circulose®, a pulp-dissolving product made 100% of textile waste that generates virgin-quality fibers such as viscose and lyocell, in addition to having launched a collection using the Green Machine, which recycles mixed cotton and polyester fabrics, an industry challenge.

### Circularity

### Social Aspects

- **Made of Air:** tested a new plastic-like material partly made from biowaste, designed to combat climate change (H&M brand).
- **Naia™Renew:** acetate fibre partly made from plastic waste (H&M brand created the world's first collection using this fibre).
- **Texloop RCOT™:** recycled cotton made from textile waste (ARKET and H&M brand).
- **Agraloop Biofibre™:** natural fibre made from low value agricultural waste (H&M brand created the world's first collection using this fibre).
- **Renu polyester™:** recycled polyester fibre made from textile waste (H&M brand).





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### Pioneering

When launching its 2020 sustainability report, the company announced the goal of reaching 30% recycled material by 2025. It also announced that 64.5% of the materials currently used are either from recycled or more sustainable sources. As far as cotton is concerned, this is already 100% more sustainable than the conventional one; 100% of man-made Cellulosic Fibers (MMCF) are sourced from low-risk suppliers (according to the Hot Button Report by Canopy) and 44% of leather products are chrome-free.

With respect to packaging, an increasingly relevant topic especially after the growth of e-commerce, the brand managed to reduce the volume used by 14% compared to 2019. By 2025, it intends to achieve a 25% reduction when compared to 2018.

Regarding the use of chemicals, 100% of fabric and leather suppliers (553 in total) are part of the Zero Discharge of Hazardous Chemicals program, with 99.9% of them regulated for effluents and 88% regulated for the use of chemicals.

Thinking about climate change, the main goals of the company are in scopes 1 and 2, aiming for an absolute reduction of 40% by 2030 (base year 2017), which is consistent with the 2-degree scenario verified by the Science Based Targets Initiative (SBTi). In scope 3

### Circularity

(emissions from the company's activities but from sources that do not belong or are controlled by the company), the goal is to have an absolute reduction of 20% or a reduction per product of 59% by 2030 (same base year). To this end, the company has been working on internal projects for energy efficiency and the use of cleaner energy, with a goal of increasing the consumption of renewable electricity to 100% by 2030 (in 2017 it was 95%), having developed a pilot carbon pricing model internally.

With regard to the circular economy, the company has promoted initiatives that start in the design, then go through the supply chain and reach the consumer experience (end use and correct disposal). In addition to more sustainable materials, H&M explores different fronts, including a pilot project of new guidelines for implementing circular design to be expanded later this year. It also explores models to extend the useful life of items through reuse, resale, and recycling systems. Along these lines, they are experimenting with children's clothing rental under the Arket brand, but the resale part is more advanced in commercial terms. They recently invested in the Swedish brand Sellpy, an online retail platform, and are now expanding this model to 20 countries.

### Social Aspects





# H&M

## Case Study

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### Pioneering

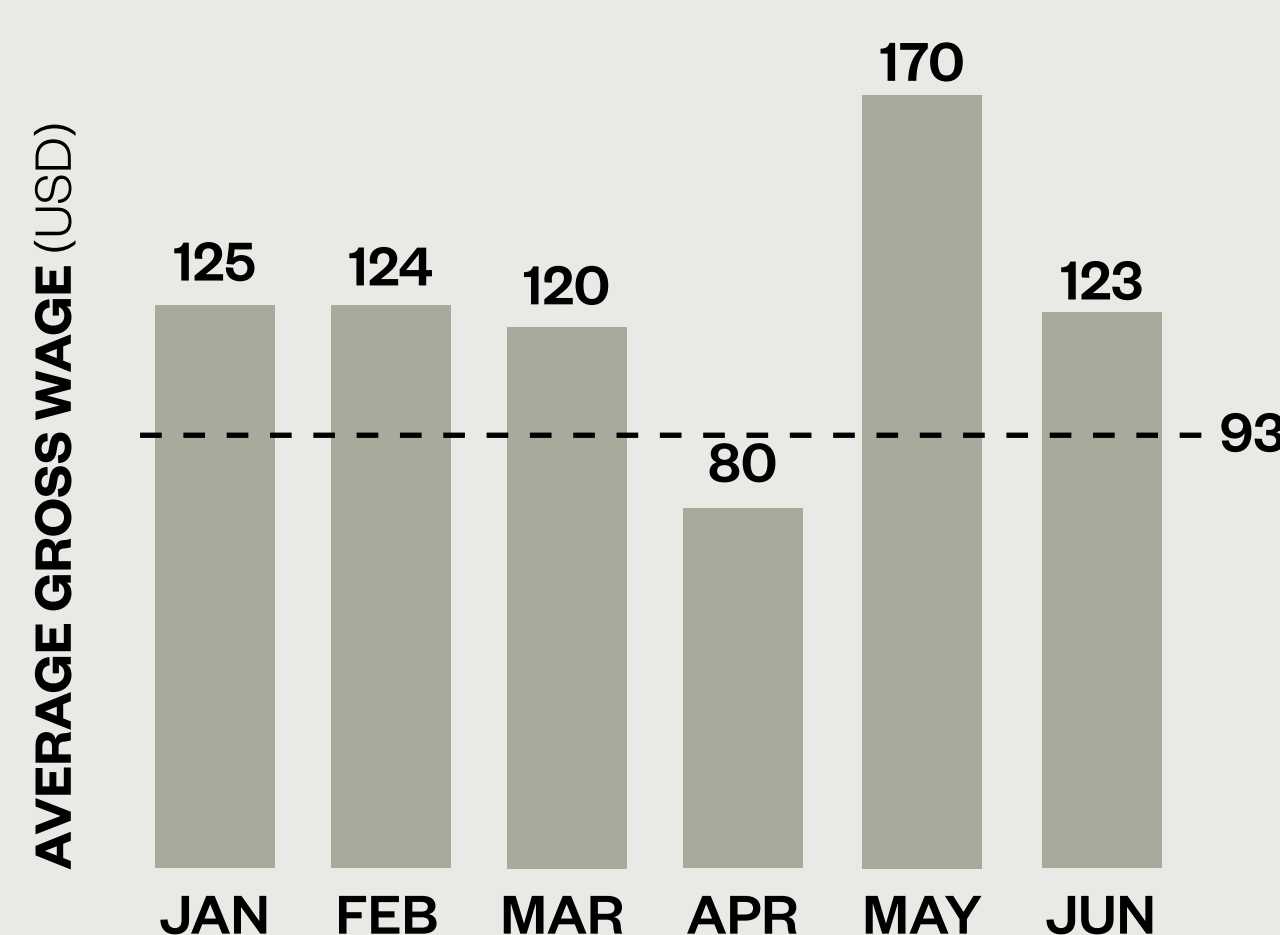
As previously mentioned, despite the fact that the apparel and footwear industry retail has a predominance of female work, when looking at executive positions, this participation drops significantly. In this sense, H&M stands out from other retailers with CEO Helena Helmersson, who previously spent five years in the company's sustainability department. The brand has 47% of women in executive positions, while the average for Brazilian retailers is 11%.

Looking at the chain as a whole, the company monitors wages and follows up on collective agreements and negotiations with unions by suppliers. This even took place during the pandemic. The data were published in the brand's sustainability report (2020).

#### GROSS AVERAGE WAGES (USD)

At supplier factories in Bangladesh for the first 6 months of 2020

--- Minimum wage



#### AVERAGE NUMBER OF WORKERS (THOUSANDS)

At supplier factories in Bangladesh for the first 6 months of 2020, compared to 2019



Graph  
H&M Sustainability Report 2020

### Circularity

### Social Aspects

In the alignment with the chain, the company introduces responsible purchasing practices such as securing financing to support suppliers and their employees. The brand's set of actions led 96% of suppliers to consider H&M a fair partner, according to the company's annual survey.

Regarding the customers, the company has initiatives aimed at educating consumers based on the transparency of the environmental impact of its products as a pillar (they have been working with the Sustainable Apparel Coalition for 10 years to develop a simple way to reveal the impact using a trusted foundation).

Still on transparency, it is possible to see the materials and the origin of some products on the H&M website. The company was ranked first in the Fashion Revolution 2020, and has been contributing to collaborative industry initiatives, for example with SAC, as mentioned.

### PRODUCT BACKGROUND

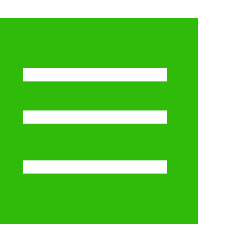
We believe that greater transparency will help lead the change towards a more sustainable future. As a step in this long-term commitment, we're sharing how and where our products are made whenever possible.

#### Materials

Our goal is to use 100% recycled or other sustainably sourced materials by 2030.

- Viscose 100%





# 5. Conclusion

With strong influence around the world and being the export base of some countries, the apparel industry has short, medium and long-term challenges in the sustainability of its operations. There are isolated and successful initiatives in this regard, and technologies are being developed that can completely change the current business model.

Wide-ranging initiatives, with the engagement of at least a few players, are still shy if we look at the size and fragmentation of this industry. An example of this is the BCI cotton crop. Twenty-three countries engage in the practice, and it covers 22% of the global production<sup>46</sup>. It is an important step forward, and many brands already have a significant amount of certified cotton, but there is still a long way to go.

When we look at the fragmentation of the market, it is necessary to remember that one of the challenges is to work on individual consumer habits. As much as this movement is more noticeable in developed countries, in general there is still resistance to paying a premium for sustainable products. This is partly because consumers have little information about their own impact, including their daily interaction with clothes (washing) and the destination given to the items.

The good news is that brands that are adapting and seeking to innovate based on more sustainable values have performed well and have become success stories, like the examples we gave in this letter.

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<sup>46</sup> Textile Exchange





The apparel sector is starting to work on solutions to improve the cultivation, sourcing, and quality of materials, taking into account scalability and longevity, in addition to matters such as reuse and the circular economy. Attention to water usage, energy efficiency, and emissions is urgent.

The technologies that have been developed both in relation to new materials and to the improvement of the production process shed light on several environmental problems, but they need to consider the social impact that certain changes can bring.

Labor practices must be reviewed as the industry is constantly accused of slave labor or working conditions that are analogous to slavery. In addition to the informality, with remuneration far below the minimum wage, little or no healthcare and safety at work, especially in the manufacturing stage but also in the production of materials, there is a large number of unskilled workers who depend on this activity. These workers may take a hit if the resolution of labor issues is exchanged exclusively for technology or process reallocation.

A new look at the distribution of earnings throughout the chain can be a short-term and highly effective measure, both in social matters and in the economy of some populations. This process is very complex, as it requires constant monitoring of the actual distribution of the resources, as well as improvements in working conditions and in the transparency of relationships, since there are several parties in the manufacturing stage (and some in the production) that are reclusive when it comes to providing information and inspection.





The role of retail is crucial to make consumers aware of their choices and to establish strict rules for the supply system. Retail has a relevant role in deciding the quality and origin of what will or will not be taken to consumers. It can become an important center of reverse logistics with collection points, both for large chains and places with a large number of stores such as malls or street stores in certain neighborhoods, which can work in a cooperative manner to collect and transport the items.

There would be two lines of action. In the short term, review labor relations, gradually improve the production process, and start a consistent consumer awareness campaign. In the medium and long term, consolidate new business models and develop highly innovative technologies such as those described in this letter.

We believe that these measures can lead the sector on an increasingly sustainable path. As we explored in this letter, the fashion industry has a relevant impact in our world and is present in everyday life. It is a sector that moves a significant amount of resources and generates millions of jobs, with different levels of specialization and global scope. It has a strong impact on the economy of several countries, with an important share in their respective GDPs. It has a cultural and social impact, often used as a form of expression by people. For an industry with such scope, we believe that its environmental and social impacts are little known and not understood.

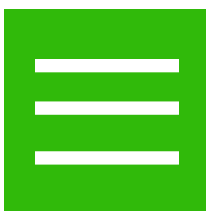




To shed light on this debate and better understand this complex chain was part of the challenge we set ourselves in this document, and it is something that as investors we believe is extremely pertinent. We have no doubt that this debate will be increasingly present in the sector. The need to make this chain more sustainable has brought important innovations (whether in technology or business models), in a process that we believe is just beginning. On the one hand, companies and brands that do not have the capacity to adapt are at serious risk of increasingly disconnecting from their customers and from the new demands that will arise. On the other hand, the most prepared and engaged organizations will be able to benefit from opportunities that will emerge from all of these changes that are coming.







With this in mind, in our study and engagement with companies, we developed a proprietary framework to assess companies in the footwear and apparel sector considering social, environmental, and governance criteria.

Below are the main points evaluated and their respective weights. Please note that the weights may change over time, as companies decide to be more open and publish their information, something that is still limited at the moment.

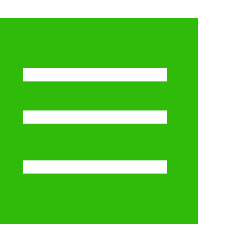
Graph XIV

**JGP Framework**  
Assessment of  
companies in the  
clothing and footwear  
sector

	Weight %
<b>Environmental (40%)</b>	<b>40</b>
Raw Material and Sustainable Materials	14
Circular Economy and Chemistry	10
Use of Resources	8
Climate Change	8
<b>Social (30%)</b>	<b>30</b>
Social Impact of the Production Chain	12
Employees and Diversity	8
Clients	6
Communities	5
<b>Governance (30%)</b>	<b>30</b>
Executive Compensation	3
Board Quality and Independence	3
Policies and Committees	3
Ethics, Integrity and Compliance	3
Rights of Minorities	3
Creditors	3
Transparency	5
Leadership Engagement with Production Chain Challenges	6
Credit Risk Management	2
<b>Score</b>	<b>100</b>

Graph XIV  
By JGP Asset Management  
(Proprietary Analysis)





# 6. About JGP

**We are an independent  
asset manager with over  
two decades of experience  
in Brazil and abroad**

MEET OUR TEAM

The company was founded in 1998 by a group of professionals who had been working together since the early 90's. Since the foundation of JGP, our company has been striving for excellence in asset management, with the objective of combining consistent returns with active risk management.

We believe in the alignment of interests between partners and investors and our assets are managed on a commingled basis. We follow the Partnership model, based on a horizontal hierarchy and a meritocratic environment.







# 7.

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