Dirty Fashion Disrupted

Leaders and laggards revealed

The purpose of this report is to shed light on industry-specific issues related to the environmental and food security impacts of the use of wild-caught fish as feed inputs in the aquaculture industry.

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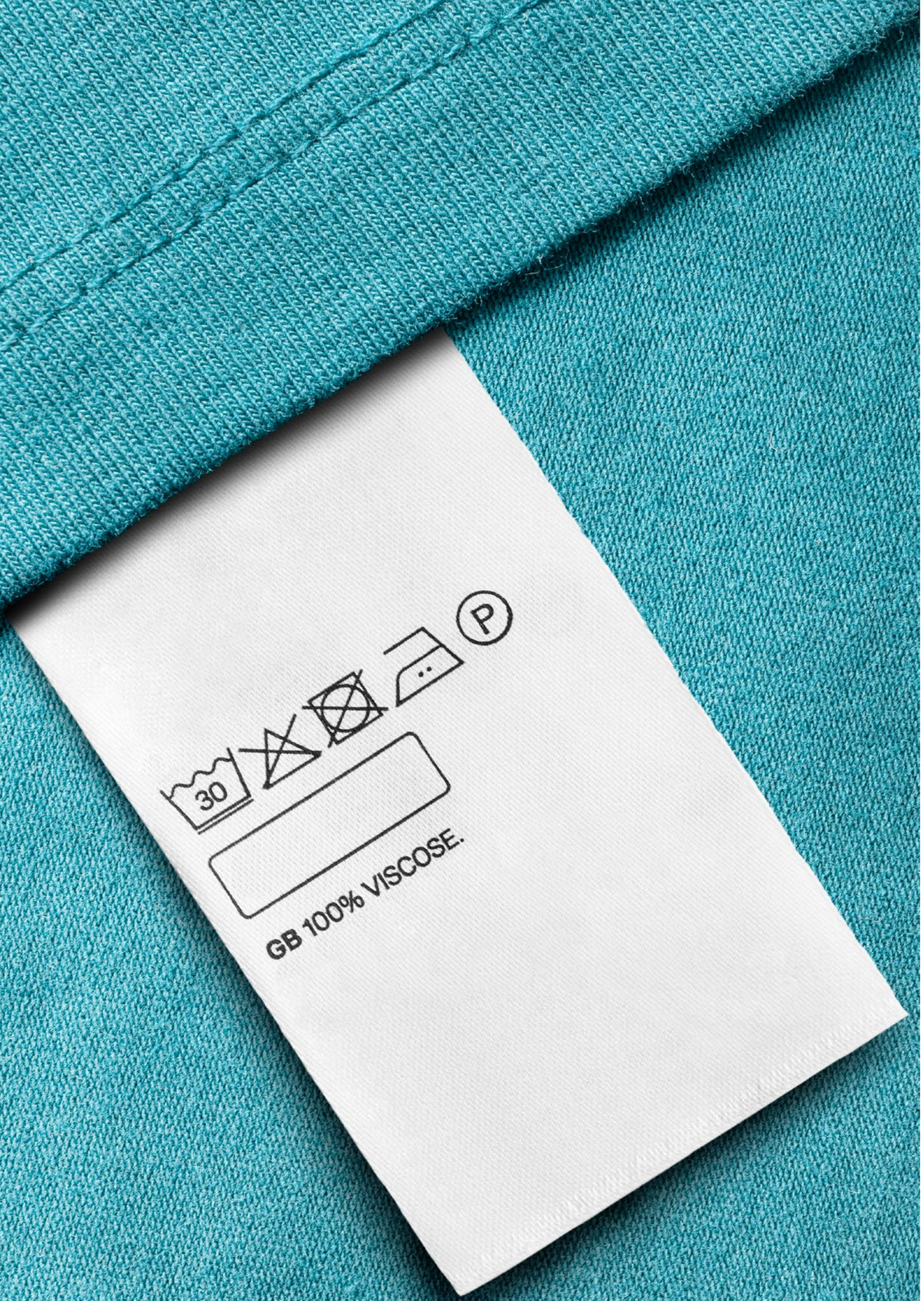
Design: Pietro Bruni - helloo.org

Contents



1. Executive Summary

One year on from *Dirty Fashion: On track for transformation*,[1] this report assesses where global clothing companies and viscose producers stand in the transition towards responsible viscose. Through detailed scrutiny of 91 brands' and retailers' transparency and sourcing policies, and producers' responsible production plans, we examine progress to date and gaps in existing commitments and pledges.

When our Dirty Fashion campaign launched in 2017, there was little knowledge of the environmental and social impacts of viscose production within the clothing industry. To the extent that brands and retailers were aware of sustainability problems in the viscose supply chain, they were mostly focused on the sourcing of timber for use in the production of wood-based dissolving pulp, which is the starting material for most viscose. In partnership with the NGO Canopy, many had pledged to stop sourcing pulp from ancient and endangered forests. Through 'Detox' commitments with Greenpeace and other initiatives, such as the ZDHC Foundation's Programme on hazardous chemicals, some had also taken action to curb pollution from wet processing by committing to phase out the use of toxic substances in textiles dyeing and finishing.

However, almost without exception, brands and retailers had neglected to address a key part of the production chain causing significant pollution and taking a heavy toll on the health and livelihoods of communities living in the shadow of viscose factories.

In June 2017, all this changed when we published *Dirty Fashion: How pollution in the global textiles supply chain is making viscose toxic*.[2] Following on-the-ground investigations in India, Indonesia and China, we revealed how companies supplying viscose to the international market were dumping untreated wastewater in lakes and waterways, ruining lives and livelihoods. Toxic run-off into rivers next to factories was destroying subsistence agriculture and had been linked to higher incidence of serious diseases in local populations. Communities living near some of the plants spoke of a lack of access to clean drinking water and sickening smells that were making life unbearable.

Some clothing companies reacted swiftly to our findings, expressing shock at the scale of the damage we had uncovered and pledging to take steps to tackle it. In the weeks and months following the publication of our report, many of them voiced their concern to us but seemed uncertain about how to drive the transition towards more responsible production.

As a result of this, in February 2018, we produced the *Roadmap towards responsible viscose and modal fibre manufacturing*,[3] which defined key principles and guidelines for cleaning up manufacturing. In parallel to the Roadmap, we published a follow-up to our first report, *Dirty Fashion revisited: Spotlight on a polluting viscose giant,*[4] which confirmed our earlier findings of pollution in the viscose supply chain but focused specifically on the world's biggest producer, the Aditya Birla Group (ABG).

With New Look and Morrisons coming on board with the Roadmap this year, ten major brands and retailers – Inditex, ASOS, H&M, Tesco, Marks & Spencer (M&S), Esprit, C&A, Next, New Look and Morrisons – have now made a public pledge to integrate its requirements into their sustainability policies. With this commitment, some of the world's biggest clothing brands and retailers are sending a strong signal to viscose manufacturers that they expect the industry to move to more responsible viscose production by 2023-25.

The report finds that that the fashion industry is waking up to the realisation that it needs to take responsibility for what happens in viscose supply chains and be transparent about where and how clothes are manufactured. 2019 has seen the highest level of engagement from brands and retailers than ever before on this issue, while manufacturers are increasingly making strides towards responsible viscose production.

Key findings:

High consumer expectations:

- Consumers expect brands to be responsible and transparent, both in terms of how workers are treated and when it comes to environmental impacts in their supply chains.
- Findings from an opinion poll published by the Changing Markets Foundation and the Clean Clothes Campaign in January 20195 show that three-quarters of the public (72%) think clothing brands should be responsible for what happens during the manufacturing process. Over half (56%) would be put off from buying from brands associated with pollution from production.
- Consumers also expect more transparency from clothing companies. The survey results show that fewer than one in five (17%) feel informed about the fashion industry's environmental and social impacts. Four in five (79%) think it is important that clothing brands provide information on their environmental commitments and seven in ten (68%) believe brands should have to provide information on their viscose manufacturers and how their production affects the environment.

Brands and retailers: clear progress on engagement, policies and transparency.

- The issue of responsible viscose production is now firmly on the agenda of the fashion industry and brands and retailers continue to make progress towards responsible viscose sourcing.
- There has been a notable improvement in engagement on the part of clothing brands and retailers. Of the 91 brands that we contacted this year, almost two-thirds (54) engaged with some kind of response to our questions, compared to roughly a third out of the 53 brands contacted last year.
- There has been a strong increase in the number of brands which either already have a viscose fibre sourcing policy in place or communicated plans to introduce one. However, where they exist, viscose manufacturing policies are often piecemeal or vague, addressing only a portion of the supply chain through "sustainable" collections or offering lofty promises of more responsible viscose without evidence of concrete action.
- Several brands have shown marked improvement when it comes to transparency. Four Changing Markets Roadmap signatories now publicly list the companies, down to factory names, supplying them with viscose.

- However, more than a quarter (27) of the brands we contacted have no viscose-specific policy of any kind. Some of these have little in place on environmental or supply chain strategies at all, which demonstrates an astonishing lack of commitment to responsible production and shows that they are completely out of step with industry trends and consumer expectations.
- Among the lowest-ranked companies, luxury brands Versace, Prada, Dior, Armani and Dolce & Gabbana rub shoulders with low-cost retailers Boohoo, Walmart, Matalan, Forever 21 and TK Maxx, proving that this problem is not confined to the cheaper end of the market.
- There is a clear divide between US and European brands. Not one US company made it to the top 'Frontrunner' category, which is dominated by European firms, while only one US brand (Victoria's Secret) made it to the second 'Could do better' category.

Producers:

We highlight promising developments on the part of a number of producers supplying viscose to the global market as well as the brands that buy from them. These include:

- ENKA's advanced approach on transparency: going a step further than other viscose producers, ENKA has disclosed consumption and emissions data on its website, demonstrating how its environmental performance compares with EU BAT values.
- Lenzing's requirement that all of its manufacturing sites comply with the Group Environmental Standard (which is aligned with EU BAT) by 2022.
- Aditya Birla Group's announcement that it has set a target for all of its manufacturing sites to be compliant with EU BAT and verified by the end of 2022. However, this commitment does not cover sulphur emissions to air.
- Lenzing and ABG have also made some steps beyond closed-loop viscose production, by investing in expansion of their lyocell capacities and embracing circular technologies using pre-consumer waste to produce lyocell and viscose.
- Two Chinese viscose fibre producers have already achieved pollution limits in line with EU BAT: Lenzing's Nanjing plant and Aditya Birla Group's Jingwei Fibres Company Limited (BJFCL).

However, the report expresses concern about the progress made by Chinese viscose producers which are part of the Collaboration for Sustainable Development of Viscose (CV) initiative's roadmap. Changing Markets analysis has previously highlighted the CV roadmap's lack of ambition, given that it only obliges its members to achieve the lower levels of the so called Clean Production Standard – a standard based on the Chinese government's recommendations – rather than making viscose producers align with EU BAT, which is the approach supported by several leading fashion brands and retailers. Analysis of new information for this report indicates that the CV initiative's upcoming five-year Roadmap to 2025 does not appear to include significant improvements on the existing objectives.

Finally, the report highlights the limitations of self-regulation, noting that the global nature of the textile industry requires an approach to tackling environmental and social violations in its supply chains that goes beyond national borders and voluntary industry-led initiatives. Despite the significant progress made by the front-runners, the fact that the majority of brands and retailers still only pay lip service to responsible viscose manufacturing or ignore it completely points to the fact that governments need to introduce legislation that will focus the entire industry's attention on delivering fashion that is better both for the environment and for people.

Viscose fibre

2. The problem: challenges and opportunities in viscose supply chains

When historians look back at the first decades of the 21st century, they may well identify 2019 as a year of global awakening – to the heavy toll human actions are exacting on our planet's finite resources, and to the terrible social and environmental consequences of rampant consumerism and irresponsible production.

While pretty much every part of the economy is implicated in the systemic ecological and climate emergency we face, some sectors have come into particularly sharp focus over recent years. The fashion industry is one such sector. With its multi-trillion-euro turnover, and an annual carbon footprint approximately equivalent to the combined carbon emissions of all 28 current members of the European Union,[6] people have begun to question the fashion industry's value to society, and many are calling time on business as usual.

Events such as Extinction Rebellion's 'funeral march' at London Fashion Week7 this year, and the widespread public outrage at Burberry's decision to burn tens of millions of pounds' worth of its own stock to protect its brand, reflect a growing sense that the clothing industry has to change its course. And, while fast fashion continues to appeal to some, there is strong evidence that its popularity is on the wane, as shoppers start to turn their backs on throwaway consumption.

Some clothing brands and retailers have begun to take notice. The most progressive among them understand that sustainability is not just a buzzword but must lead to a fundamental shift in the way companies operate. In a globalised society, consumers will increasingly judge firms on their ability to ensure high environmental and social standards are enforced throughout their supply chains. This means companies will have to become much more proactive in defining and upholding responsible practices at every stage of production. They will have to prove they are not just paying lip service to sustainability and ensure genuine transparency by opening their supply chains up to external scrutiny. The first part of this report examines this trend, analysing the findings of a major poll Changing Markets Foundation and the Clean Clothes Campaign conducted in early 2019. It shows that the public has high expectations of clothing companies, and that brands and retailers can no longer turn a blind eye to unethical and polluting practices in their viscose supply chain.

Against this backdrop, the report also examines progress in efforts to clean up global viscose production, specifically the transformation of cellulose (mainly wood-based) pulp into viscose fibre and yarn. A growing number of industry players are now working together to stop sourcing wood pulp from ancient and endangered forests through their partnership with the CanopyStyle initiative. By signing up to 'Detox' commitments with Greenpeace, a large group of clothing brands and retailers has also demonstrated serious intent to address impacts from the discharge of toxic chemicals at the wet processing stage of textiles production. However, taken

Dirty Fashion Disrupted: Leaders and laggards revealed

in isolation, these undertakings do not prove a company is sourcing responsibly produced viscose. Since the publication of our first *Dirty fashion* report in June 2017, a steadily increasing number of brands and retailers has taken this message to heart, and there is now a common understanding that tackling pollution from the manufacturing of viscose fibre is a vital additional step towards putting the industry on a more sustainable footing.

BOX 1: **What is viscose and how is it produced?**

Viscose and other cellulosic fibres are the third most commonly used fibres in the world (after synthetics and cotton).8 Market concentration in the global viscose fibre industry is relatively high. The top three producers are Lenzing AG (based in Austria), Aditya Birla Group (India) and Tangshan Sanyou Chemical Industries Co., Ltd (China), whose revenue market share equated to 19.01%, 18.48% and 9.04% respectively in 2018.9 The industry's compound annual growth rate is 4.87% from 2018–24.[10]

As a biodegradable fibre, viscose has the potential to be a sustainable alternative to oil-derived synthetics and water-hungry cotton. However, to fulfil this potential, production methods and sourcing practices must change.

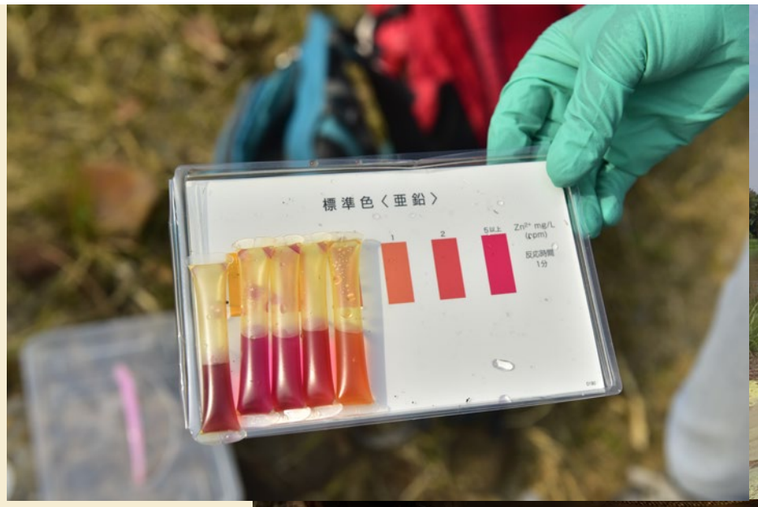
In 2017 and early 2018, the Changing Markets Foundation worked with local NGOs and investigative reporters to carry out on-the-ground investigations in the top three viscose-producing countries: India, Indonesia and China. In all three countries, we found clear evidence of viscose producers dumping untreated wastewater, contaminating local lakes and waterways, and impacting on the lives and livelihoods of local people.

Viscose production relies on a number of highly toxic and corrosive chemicals. With careful chemical management, viscose can be produced in a responsible way, maintaining chemicals in a closed-loop system and reducing discharges to the environment. However, many manufacturers are yet to adopt best practices. At the heart of viscose production is carbon disulphide (CS2), a toxic and endocrine-disrupting chemical. CS2 has been linked to numerous serious health conditions – most notoriously insanity in factory workers, but also a wide range of illnesses, ranging from kidney disease and Parkinson's-like symptoms to heart attack and stroke.[11] The chemical can be present in both water and air, as a result of pollution from viscose factories, and can impact health at very low concentrations.[12]

During the spinning process, hydrogen sulphide (H2S) is also generated as a by-product. H2S is a highly toxic gas that can cause irritation of the eyes, function impairment and neurobehavioural changes.[13] Its presence can be recognised by the distinctive odour of rotten eggs. During our investigations, people we spoke to frequently complained of the foul smells emitted by nearby viscose plants.

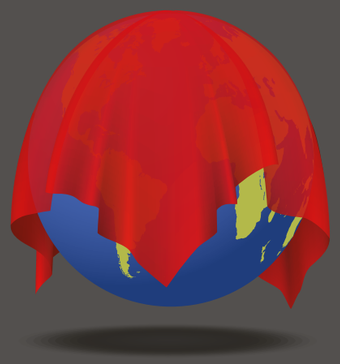
Sodium hydroxide (NaOH; also known as caustic soda) and sulphuric acid (H2SO4) are also used in the production of viscose. NaOH can be highly toxic if absorbed through inhalation, ingestion or skin contact, and is known to cause corrosion, skin burns and eye damage to workers who handle it frequently and without protection. H2SO4 is a highly corrosive, clear, colourless oily liquid. It can result in adverse health effects from inhalation, such as a burning sensation and shortness of breath. Evidence suggests that occupational exposure to sulphuric acid mists, in combination with other acid mists, can be carcinogenic.[14]

Without proper chemical management and treatment, these toxic chemicals find their way into the air and waterways surrounding viscose factories, affecting the delicate natural balance of ecosystems and water bodies, and harming the health of factory workers and local communities. But better production methods do exist, in which viscose is produced in a closed-loop system, limiting emissions to water and air.



Our investigations in Asia during 2017 and 2018 demonstrated the devastating impacts of irresponsible viscose production on environment, people's health and livelihoods

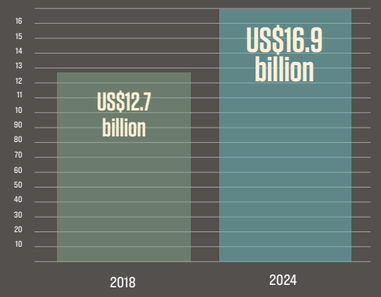
THE GLOBAL VISCOSE INDUSTRY – KEY FACTS



COMPOUND ANNUAL GROWTH RATECAGR)

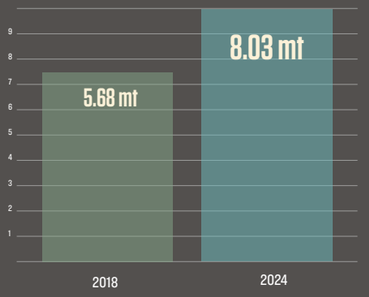
+ 4.96%

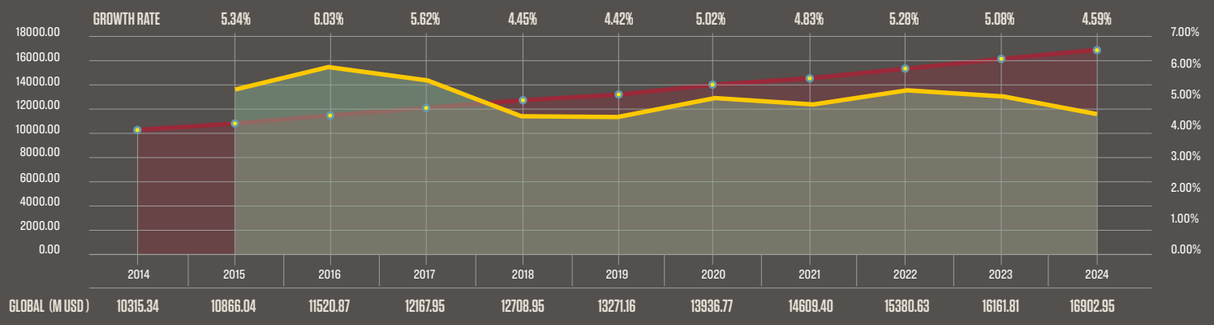
GLOBAL REVENUE



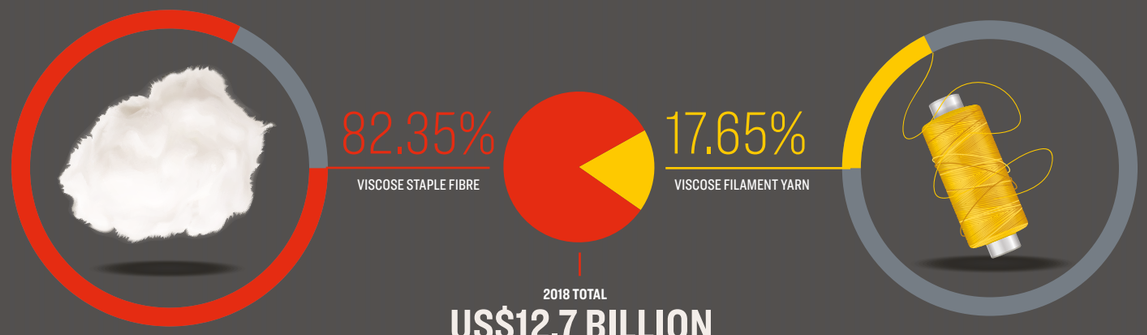
GLOBAL VOLUME
(MILLIONS OF TONNES)

+ 2.35 mt

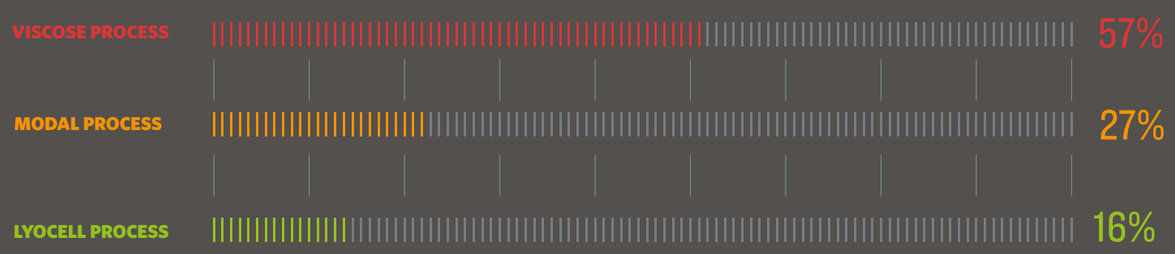




VISCOSE STAPLE FIBRE MAKES UP THE MAJORITY OF VISCOSE FIBRE PRODUCTION, WITH VISCOSE FILAMENT YARN REPRESENTING A SMALLER SHARE.

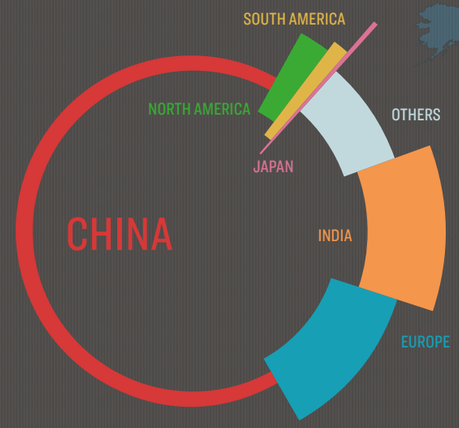


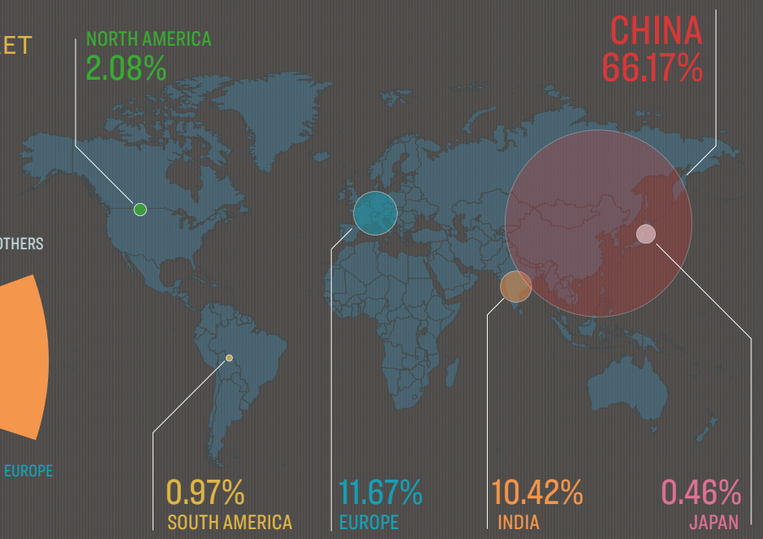
THE VISCOSE PROCESS IS THE DOMINANT PRODUCTION METHOD, REPRESENTING MORE THAN 57% OF THE GLOBAL VISCOSE MARKET IN 2018; MODAL AND LYOCELL REPRESENT AROUND 27% AND 16% RESPECTIVELY.



Source: Maia Research (2019) Global Viscose Fiber Industry Market Research

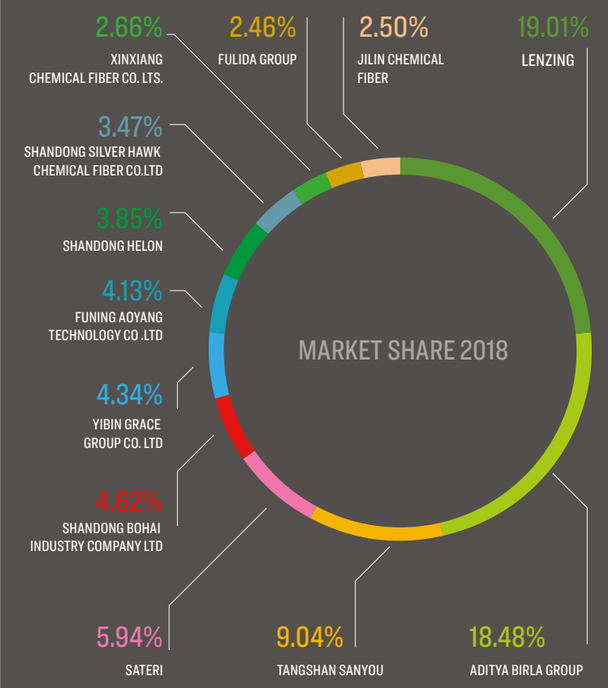
GLOBAL VISCOSE FIBRE MARKET SHARE BY REGION, 2018



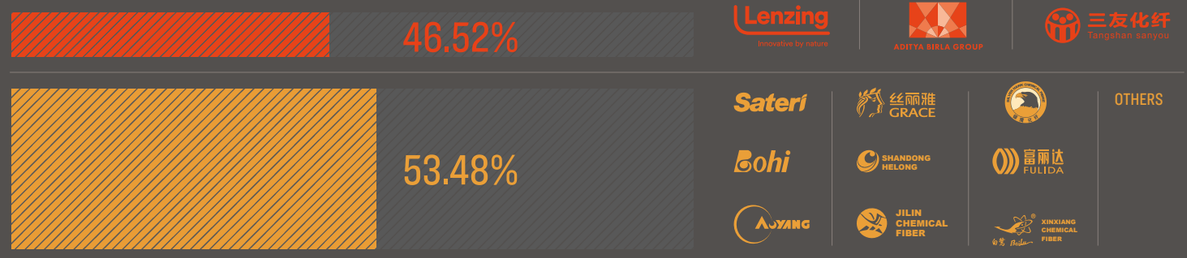


MAJOR PLAYERS IN VISCOSE FIBRE PRODUCTION BASED ON MARKET SHARE, 2018

MANUFACTURING BASE			
Lenzing	ASIA PACIFIC, EUROPE, NORTH AMERICA	ADITYA BIRLA GROUP	ASIA PACIFIC
三友化纤 Tangshan sanyou	ASIA PACIFIC	Sateri	ASIA PACIFIC
Bohi	ASIA PACIFIC	丝丽雅 GRACE	ASIA PACIFIC
AOYANG	ASIA PACIFIC	SHANDONG HELONG	ASIA PACIFIC
SHANDONG SILVER HAWK CHEMICAL FIBER Co LTS	ASIA PACIFIC	XINXIANG CHEMICAL FIBER	ASIA PACIFIC
富丽达 FULIDA	ASIA PACIFIC	JILIN CHEMICAL FIBER	ASIA PACIFIC



THE TOP THREE COMPANIES ACCOUNTED FOR 46.52% OF MARKET SHARE IN 2018



(iStock)

3. High consumer expectations on transparency and environmental performance in clothing production

When it comes to sustainability in the fashion industry, consumer mindsets are changing. Repeated scandals and controversy relating to environmental pollution and worker conditions in clothing supply chains are leading to growing realisation of the impacts of garment manufacturing, which the public can no longer brush aside.

People expect brands to be responsible and transparent, in terms of both how workers are treated and the environmental impacts of their supply chains. This is reflected in findings from an opinion poll, published by the Changing Markets Foundation and the Clean Clothes Campaign in January 2019, looking at public perceptions on environmental and labour issues within the fashion industry (see Infographic 2).[15] These findings are the result of a comprehensive survey, conducted by Ipsos MORI,[A] in which over 7,000 interviews were carried out in seven countries – the UK, France, Germany, Italy, Poland, Spain and the United States.

The survey results show that close to three-quarters of the public (72%) across all countries think clothing brands should be responsible for what happens during the manufacturing process. Over half (56%) would be put off from buying from brands associated with pollution from production.

Consumers also expect more transparency in clothing companies' supply chains, in terms of their impacts on people and the environment. The survey results show that fewer than 1 in 5 (17%) surveyed feel informed about the fashion industry's environmental and social impacts, while 4 in 5 (79%) think it is important that clothing brands provide information on their environmental commitments, and 7 in 10 (68%) believe brands should have to provide information on their viscose manufacturers and how their production affects the environment. Only one in five (21%) would believe a brand if it said it was difficult to know who their suppliers of viscose were. The majority of the public (70%) across all countries feels that the names and locations of factories used in the clothing supply chain should be disclosed.

Although people want more information about the clothes they buy, most are sceptical about the credibility of information that brands communicate. Fewer than one in five (19%) consider information provided by clothing brands themselves to be the most trustworthy source of information about how sustainable they are.

The survey highlights that public expectations of clothing companies are rising, and that brands and retailers can no longer turn a blind eye to unethical and polluting practices in their viscose supply chain. The poll responses demonstrate that, in light of growing awareness among consumers, sustainability and transparency are no longer optional extras for global fashion brands, but rather a 'must' for doing business.

A The Changing Markets Foundation commissioned Ipsos MORI to undertake a consumer poll of adults aged 16–75 in seven countries; the UK, France, Germany, Italy, Poland, Spain and the US. A total of 7,701 interviews were carried out – over 1,000 in each country.

WHAT DO CONSUMERS EXPECT FROM CLOTHING COMPANIES?

Findings from a major consumer poll conducted by Ipsos MORI in 2019.

7,000 people were surveyed in 7 countries:

the UK, France, Germany, Italy, Poland, Spain and the United Sates.

7,000 INTERVIEWS

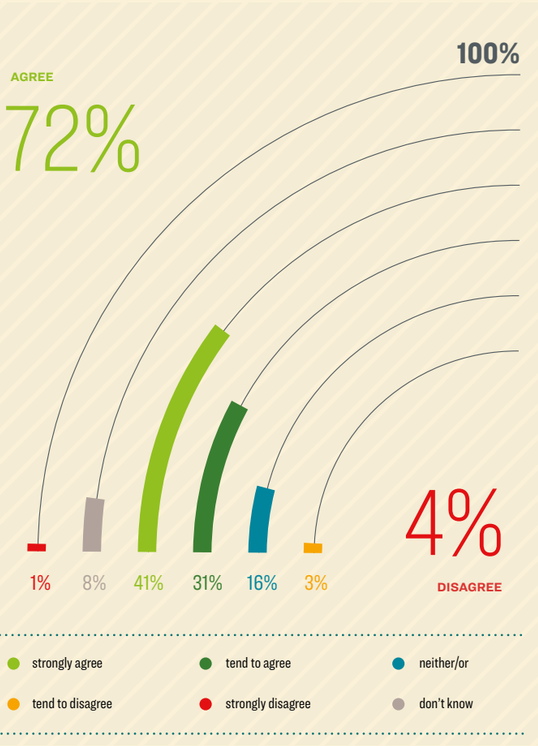
SEVEN COUNTRIES

UNITED STATES · UNITED KINGDOM · FRANCE · ITALY · GERMANY · POLAND · SPAIN

THE MAJORITY OF THE PUBLIC THINK CLOTHING BRANDS SHOULD BE RESPONSIBLE FOR WHAT HAPPENS DURING THE MANUFACTURING PROCESS AND WOULD BE PUT OFF FROM BUYING FROM BRANDS ASSOCIATED WITH POLLUTION.

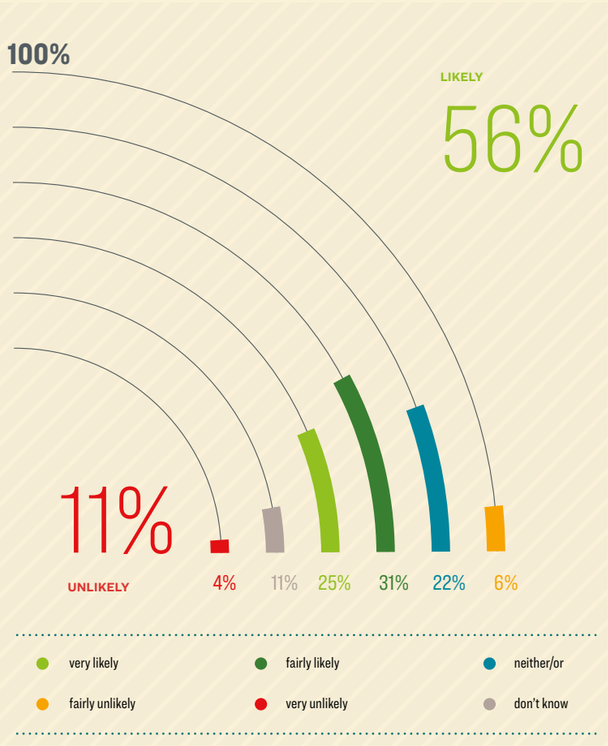
To what extent do you agree or disagree with the following statements?

Clothing brands should be responsible for what happens in their manufacturing processes and should take measures to ensure that the clothes are manufactured in an enviromentally friendly way



How likely or unlikely would the following things be to put you off buying clothing from a brand that you currently buy from?

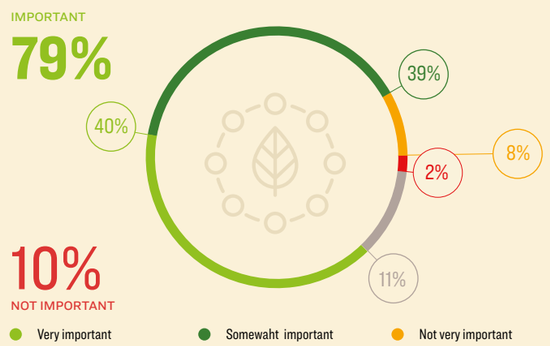
If the clothing brand was associated with enviromental pollution in its manufacturing processes



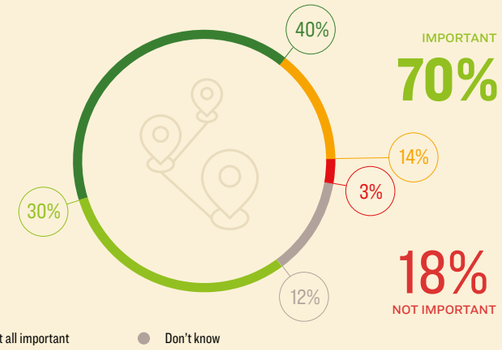
CONSUMERS EXPECT BRANDS TO BE TRANSPARENT ABOUT THEIR VISCOSE SUPPLY CHAIN, THEIR COMMITMENTS AND THE IMPACTS OF PRODUCTION ON PEOPLE AND THE ENVIRONMENT.

How important, or not, do you think it is that clothing brands should provide information on the following?

Their environmental commitments and measures they are taking to help minimise pollution in their supply chain

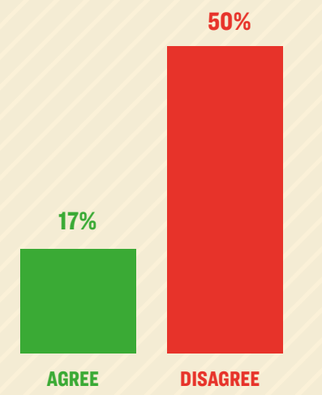


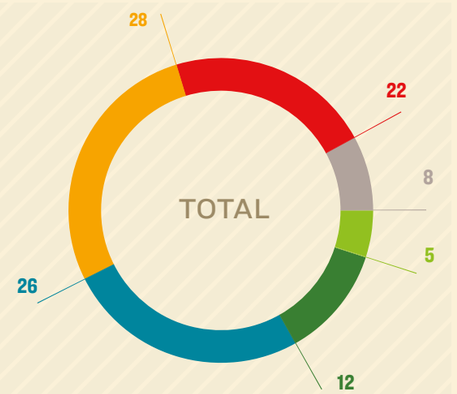
The names and location of the factories they use throughout their supply chain



To what extent do you agree or disagree with the following statement ?

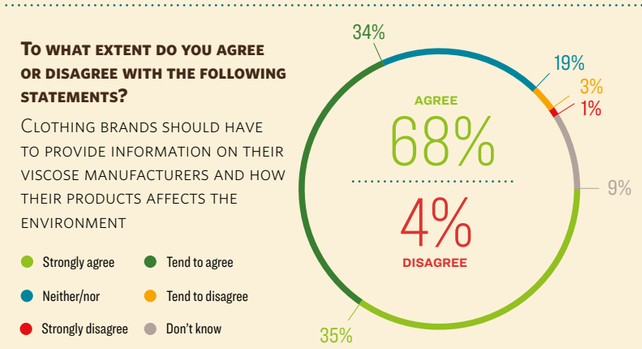
The fashion industry informs consumers about the environmental and social impacts of the manufacturing of their clothes





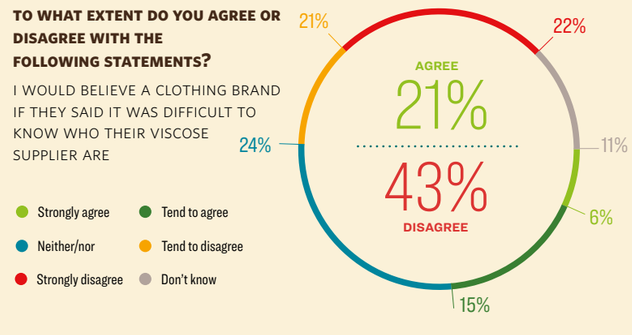
To what extent do you agree or disagree with the following statements?

Clothing brands should have to provide information on their viscose manufacturers and how their products affects the environment

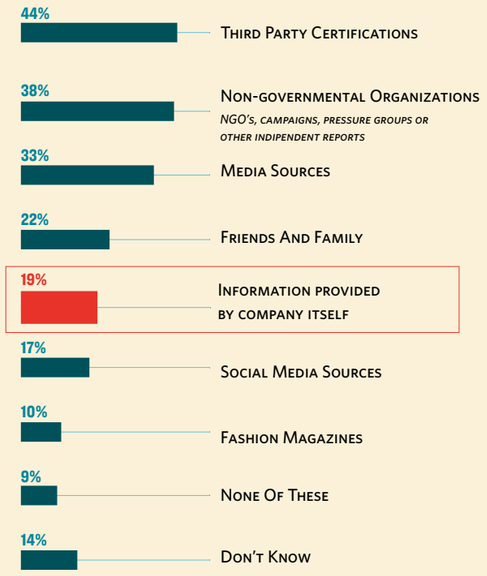


To what extent do you agree or disagree with the following statements?

I would believe a clothing brand if they said it was difficult to know who their viscose supplier are



Which sources of information, if any, would you trust if you wanted to find out how sustainale a clothing brand is



4. Rising to the challenge: Roadmap towards responsible viscose manufacturing

Bags of semi-processed viscose scattered around a village adjacent to PT Indo Bharat Rayon and PT South Pacific Viscose factories, West Java, Indonesia

In February 2018, the Changing Markets Foundation launched a *Roadmap towards responsible viscose and modal fibre manufacturing* to address the environmental and social problems in viscose fibre manufacturing and provide a blueprint for responsible production. The *Roadmap* was developed due to the absence of an ambitious and comprehensive framework for addressing these challenges; it provides guidance for brands, retailers and producers willing to move towards closed-loop viscose manufacturing. **We define 'closed-loop production' as a process whereby chemical inputs are captured and reused, instead of being released into the environment. More specifically, closed-loop production ensures that emission controls and chemical recovery rates are in line with EU Best Available Techniques (BAT)** (See Box 2)**.**

The *Roadmap* is designed to give retailers and brands ownership to drive the transformation, by engaging with their suppliers to reach ambitious environmental and social targets that go beyond the existing regulatory framework. More specifically, committed brands are expected to use their leverage with manufacturers to drive the transition to closed-loop production, in line with EU BAT.

The *Roadmap* is a complementary strategy to efforts many brands are already undertaking on responsible viscose sourcing (e.g. the CanopyStyle initiative[16]) and responsible chemical management

H&M INDITEX asos discover fashion online
TESCO C&A next
ESPRIT New Look M&S EST. 1884
MORRISONS

(e.g. through the Greenpeace Detox commitment17 or membership of the Zero Discharge of Hazardous Chemicals (ZDHC) programme[18]). It is not a certification scheme but rather a blueprint for responsible viscose manufacturing, which provides a list of principles that retailers and brands should integrate into their own responsible sourcing policies. To come on board with this transformation, brands need to engage with their viscose suppliers and ensure they:

- are in possession of all requisite environmental permits;
- comply with relevant national and local environmental regulations;
- implement plans for appropriate chemical-management systems, including wastewater treatment and measures to prevent emissions to air;
- commit to moving towards closed-loop production, in line with EU BAT (see Box 2);
- protect workers and local residents from exposure to dangerous chemicals;
- set energy efficiency and greenhouse gas (GHG) emissions reduction goals; and
- remediate damage to the environment surrounding factories as a result of irresponsible production methods.

Brands and retailers are required to be transparent about their progress towards these objectives, and to ensure regular and independent monitoring and verification of how suppliers are addressing the risks and moving towards a closed-loop system.

With New Look and Morrisons coming on board this year, ten major brands and retailers – ASOS, C&A, Esprit, H&M, Inditex, Marks & Spencer (M&S), Morrisons, New Look, Next and Tesco – have now made a public pledge to integrate the *Roadmap*'s requirements into their sustainability policies. With this commitment, clothing brands and retailers are sending a clear message to viscose manufacturers that they expect the industry to move to more responsible viscose production by 2023–25.

BOX 2: **Best Available Techniques (BAT) for the Production of Polymers**

The EU's BAT Reference Document (or BREF) on Polymers was published in 2007 under the auspices of the European Commission. It defines the most effective techniques for achieving environmentally responsible production of polymeric materials, such as synthetics and cellulose-based fibres, including viscose.[19]

The BREF is the result of an exchange of information, carried out from 2003–05, between EU Member States, the EU viscose industry and NGOs. It is based on operating data that EU industry players supplied at the time, meaning the values and techniques set out in the BREF reflect what the best performers in the industry were already achieving over a decade ago. In the EU, conclusions on BAT are also used as the main reference when Member State authorities issue operating permits and grant licences.[20]

In the Changing Markets Foundation's *Roadmap*, we identified EU BAT on viscose – as described in the BREF on Polymers – as the most comprehensive and ambitious standard; it sets limits on chemicals usually discharged from the viscose-manufacturing process, and addresses pollution to both air and water (see Table 1).

	Standard	Air pollution	Water pollution			Energy	Solid waste
Viscose staple fibre	EU BAT	Sulphur to air (kg/t) expressed as an annual average	Zinc to water (g/kg)	Chemical oxygen demand (g/t)	Sulphate (kg of SO42-/tonne)	Direct energy (GJ/t)	Hazardous waste (kg/t)
		12–20	0.01–0.05	3,000–5,000	200–300	20–30	0.2–2.0

Table 1. *EU BAT emissions standards for viscose staple fibre production*

Source: *European Commission (2007) Reference Document on Best Available Techniques in the Production of Polymers.*

EU BAT have a wider international impact beyond the EU; according to the European Commission, BAT were developed '*so that non-EU countries can also reap the benefits of this ambitious work*'.[21] Since 2016, Austrian producer Lenzing has achieved EU BAT at two of its viscose fibre plants,22 one of which is based outside of the EU (Nanjing, China). According to Aditya Birla Group data, Birla Jingwei Fibres Company Limited (BJFCL) in China is also compliant with EU BAT norms. Both Lenzing and Aditya Birla – two of the world's biggest viscose producers – have committed to achieving production in line with EU BAT at all their viscose plants by 2023–25. That means the BAT serve as a benchmark for responsible viscose production worldwide.

EU BAT only cover viscose staple fibre (VSF) manufacturing – not viscose filament yarn (VFY), which represents a much smaller percentage of production (around 17%).[23] The Changing Markets Foundation has identified some of the ambitious standards relevant to VFY in the *Roadmap*.

5. The role of brands

5.1. Are brands genuinely embracing sustainability?

Increasing evidence of the impacts of garment manufacturing on our planet has prompted some clothing brands and retailers to increase their sustainability efforts. In the past decade or so, a plethora of initiatives, pacts, certification schemes, alliances and innovation platforms have been formed with the promise of leading the fashion industry towards a more sustainable future.

A growing number of brands have their own in-house strategies for, and commitments to, more sustainable fibre use. These range from general claims about the use of 'sustainably sourced', 'organic' or 'recycled' materials in their collections to the rollout of separate 'sustainable' collections. A recent McKinsey survey of apparel company executives showed that sustainable sourcing is among chief sourcing officials' top priorities.[24] Some brands have made very far-reaching pledges, such as high-street chain Zara's announcement that all its collections will be made from 100% sustainable fabrics by 2025.25

While, in principle, these initiatives are commendable, many companies provide little or no detail regarding what counts as 'sustainable' or 'organic', what share of their overall collection is covered or how their objectives are implemented, tracked and transparently reported on. Key questions here include:

- To what extent are corporate sustainability commitments followed through on?
- Is progress recorded to ensure companies are taking meaningful action, rather than merely paying lip service to sustainability?

5.2. Commitments vs. actions

While brands' commitments make headlines, and are widely interpreted as proof that the sector is moving to clean up its act, the evidence indicates that, in many cases, they are failing to translate into concrete action or results. For example, a Labour Behind the Label investigation in 2018 found that H&M had backtracked on its commitment to ensure workers in its supply chain were paid a fair living wage,[26] while a Sheffield Political Economy Research Institute report in May 2019 showed other global fashion brands were also failing to deliver on living-wage commitments.[27]

A recent study by the Global Fashion Agenda, Boston Consulting Group and Sustainable Apparel Coalition indicates that fashion companies' sustainability efforts have slowed down, and that fashion companies are not implementing sustainable solutions fast enough to address the negative environmental and social impacts of the rapidly growing industry. According to the study, this year's progress came from two segments: medium- and

(iStock)

large-size players ($0.1–10 billion in revenue) in the entry-price segment, and small-size players (<$0.1 billion in revenue) in the mid-price segment. While luxury brands generally rank higher, they have made slower progress.[28]

Although sustainability is rising up the corporate agenda, the report warns that the speed of measurable progress over the past year has decreased by one-third. Concerningly, it finds that 40% of all fashion companies have not even begun to take sustainability seriously by setting targets and rethinking their supply chain. The report concludes that, '*[as] a result, if the industry does not implement changes at a faster rate, it will not be able to achieve the United Nations Sustainable Development Goals or meet the Paris Agreement*'.[29]

5.3. Commitments vs. responsibility and accountability

Another worrying finding shows that, even where clothing companies claim to implement their commitments and monitor and verify the impacts on the ground, the auditing system is systematically flawed. A recent Clean Clothes Campaign report raises concerns that the multi-billion-euro social-auditing industry is operating as a corporate social responsibility tool to protect brand reputation and profits while aggravating risks to garment workers. According to the findings, corporate-controlled social auditing is defective and does not protect workers, as has been demonstrated by several tragedies in factories that auditors have pronounced safe – including the devastating collapse of the Rana Plaza building in Bangladesh in April 2013, which killed 1,134 people, and the July 2017 boiler explosion in the Multifabs factory in Bangladesh, which killed or injured dozens of workers.[30] These problems are not restricted to social auditing; they are characteristic of monitoring and verification in general. In many cases, auditors do not have the skills, knowledge or incentives to adequately detect negative impacts, but nevertheless issue reports that reassure companies about their suppliers' safety and environmental performance.

BOX 3: What does good auditing look like?

To ensure transformation takes place, brands should regularly monitor and verify how policies and commitments are being actioned by their suppliers. This process should be:

1. **independent**, through third parties with no conflict of interests;
2. **regular**, providing periodic review to brands on how suppliers' practices align with commitments; and
3. **transparent** about how brands are fixing the problems and how suppliers are addressing and mitigating the identified risks.

Independent auditing should cover not only chemical management, emissions to water and air, workers' health and safety at production sites but also the potential impacts on local communities. The auditor should also provide recommendations for improvement and remediation. It is key that the auditing documents and final report are made publicly available to allow for public monitoring of remediation efforts.

Clothing companies should further refer to the social-auditing guidelines set out in the Clean Clothes Campaign's recent *Fig leaf for fashion* report.[31]

5.4. Commitments vs. transparency

Transparency remains elusive across much of the textile and clothing sector, making it impossible to meaningfully track brands' progress towards social and environmental commitments, even where these are robust. Fashion Revolution's 2019 *Fashion transparency index* notes:

> *Despite some progress over the past six years [since the Index began], the fashion industry still operates in an opaque manner and the lack of information about where our clothes and accessories are made and who made them is a huge barrier to change. Human rights abuses, gender inequality and environmental degradation remain rife and we know that exploitation thrives in hidden places.*[32]

At its worst, lack of transparency creates a lack of accountability and allows irresponsible practices to continue unchecked. The continued drive for low-cost fast fashion encourages companies to cut corners, and enables brands and other multinational companies to escape scrutiny for problems further back in their supply chain. Earlier this year – following a deadly explosion at Jiangsu Tianjiyai Chemical Co. in March 2019, which killed at least 70 people – the Director of the Beijing-based Institute of Public & Environmental Affairs (IPE) said he was shocked to find that some chemical giants supplying textile dyes did not even know the names of their intermediate suppliers, and pointed to a link between the tragedy and the continued drive for low-cost fashion.33

In the wake of various clothing companies' commitments to source '100% sustainable fibres', the authors of a 2019 article in *Sourcing Journal* discuss the 'transparency paradox', which refers to the phenomenon of '*apparel brands wanting to achieve a 100% sustainable fibres target, but having limited to no visibility on their textile fibre suppliers*'. The absence of deep transparency across all stages of the textile supply chain throws up a challenge for companies, which will be unable to demonstrate achieving their target,34 and may face regulatory and consumer backlash as a result.

This point was illustrated earlier this year, when the Norwegian Consumer Authority's (CA) examination of H&M's Conscious Collection, which H&M claims is more sustainable than the rest of its products. The CA found that H&M is:

> 'misleading' consumers by failing to provide adequate detail about why their garments are less polluting than other garments and that without more information, it is unclear to the consumer whether H&M is in fact engaging in sustainable manufacturing and sourcing, or simply painting itself as more sustainable than it really is to sell more products.[35]

Any company that genuinely embraces responsible production should see transparency as a key requirement. It provides an opportunity for competitive differentiation,[36] and will be key to building a circular textile economy.[37]

Consumers will increasingly call on brands to deliver greater transparency. According to Futerra and the Consumer Goods Forum, the second half of the 20th century saw huge changes in consumer expectations regarding transparency, driven by three factors: mass education, mass media and massive scandals.[38] Research by Label Insight shows that:

> *78% of consumers trust transparent brands more. […] Yet many businesses are still geared towards secrecy, protecting commercial information and hoarding of contacts, data and insight internally. Which might be a reasonable strategy, except that consumers are seeking out their own transparency channels. 74% of shoppers now turn to the internet for answers when they don't find the information they're lovoking for from the manufacturer. Consumer reviews, activist websites and even random tweets are filling the information void left by companies.*[39]

Simply put, transparency is not an optional extra – and, as the 21st century marches on, companies that fail to take it seriously will feel the impact on their bottom line.

BOX 4: What does real transparency look like?

Transparency should apply to all stages of a company's supply chain; that is, not simply to Tier 1 and Tier 2 suppliers, but right back to the supply of raw materials.

Transparency means:

- Transparency in corporate policies, which should contain specific, measurable, attainable and time-bound targets for improvement;
- Transparency about product origin (including source of raw materials);
- Transparency about environmental (including water and air pollution, and CO2 emissions) and social impacts of production;
- Transparency about how workers are treated throughout the supply chain, and about worker grievances;
- Transparency about how environmental and social impacts, as well as worker grievances, are dealt with;
- Transparency about product composition, full life-cycle impacts (including, where applicable, from use), biodegradability and potential breakdown products; and
- Transparency about auditing outcomes, including full disclosure of report findings and recommendations.

Companies should not muddy the waters by conflating *traceability* with transparency. Traceability is usually used to refer to companies having internal visibility over their own supply chains; however, it does not necessarily mean this information is available in the public domain.

These findings demonstrate that, while the winds of change are starting to blow in the fashion industry, clothing brands have a long way to go to ensure responsible production in their supply chain – of which transparency is a vital part. Brands and retailers need to put sustainability at the core of their business model, not make it an optional add-on. In other words, companies need to integrate environmental and social considerations into every business decision, and make them an integral part of their supplier relationships.

5.5. Where do brands stand on viscose?

Over the past two and a half years, the Changing Markets Foundation, in partnership with other international NGOs, has engaged with clothing brands to gather information about their viscose supply chains.

In 2019, the Changing Markets Foundation – along with Fashion Revolution, Ethical Consumer, the Clean Clothes Campaign and WeMove.eu – reached out to over 90 global clothing brands and retailers, asking them for their most recent information on how they source viscose, and inviting them to commit to the *Roadmap*'s principles. These included 39 brands that Changing Markets had not previously asked to provide such information.

Changing Markets wrote to 91 clothing companies (via both email and post) in August 2019, asking them how much viscose they use, the details of any policies they have to address the environmental impacts of their viscose supply chain, the names and factories of their viscose suppliers, and any plans to disclose these suppliers publicly in the future.

While Changing Markets reached out to a far larger group of brands in 2019 than in 2018, the response rate was significantly higher than last year: Almost two-thirds (54) of the 91 brands contacted responded in some way to our questions, compared to roughly one-third of the 53 brands contacted last year.

Their responses are summarised in the table provided as an annex to this report (see poster *Where do brands stand on viscose?)* and on the *dirtyfashion.info* microsite. The table also presents information publicly available on each company's website, including for brands that did not respond to our letter. Based on this information, the table separates brands into four categories. To rate highly, companies needed to provide real and measurable signs of progress, in line with the Changing Markets *Roadmap*.

The results show that many brands and retailers are increasingly making progress towards responsible viscose supply. This year saw not only a higher rate of engagement than in previous years but also a strong increase in the number of brands that either already have a viscose fibre-sourcing policy in place, or had plans to introduce one. However, where they exist, viscose-manufacturing policies are often piecemeal or vague, addressing only a portion of the supply chain (through 'sustainable' collections) or offering lofty promises of more responsible viscose without evidence of concrete action. Meanwhile, a large number of brands still fails to even recognise the need to address the impacts of viscose fibre manufacture in their supply chains, or to signal any effort to move towards a more responsible supply.

Many brands have shown a marked increase in transparency on their viscose supply chain. On their websites, four Changing Markets *Roadmap* signatories now publicly list the companies – down to the factory names – that provide them with viscose fibre. At the time of writing, the remaining signatories (apart from Inditex), as well as several other brands, have disclosed the name of at least several of their viscose suppliers on their websites. However, the vast majority of brands are lagging a long way behind the frontrunners on transparency.

Interestingly, a clear divide appeared this year between US and European brands. Not one US company made it to the top 'Frontrunner' category, which European firms dominated, and only one US brand (Victoria's Secret) made it to the second-best 'Could do better' category. Meanwhile, almost half of the bottom 'Red-zone' brands are US-based. Among these lowest-ranked companies, luxury brands Versace, Prada, Dior, Armani and Dolce & Gabbana rub shoulders with Boohoo, Walmart, Matalan, Forever 21 and TK Maxx.

There are reassuring signs that our call for the viscose industry to clean up its act has been heeded, and grounds for optimism that industry transformation remains on track. The fact that more and more brands are putting policies in place to address the impacts of viscose production and raw-material sourcing sends a clear message to producers: They must pursue or develop plans to improve viscose-manufacturing processes if they are to remain competitive on the global market.

However, the majority of brands still do not have robust policies in place, or the desired level of transparency. This highlights the need for government regulations – both to level the playing field and to ensure industry laggards, such as most luxury brands, take action.

BOX 5: **Methodology for brands' categorisation**

In 2019, 91 brands were contacted with a letter by email and post, from which almost two-thirds (54 brands) provided responses. These responses were then reviewed, along with research into the viscose policies and supply chain disclosures available on each company's website. Companies were then assessed using the following main criteria: transparency, policy/commitments and meaningful engagement.

A company was rated lower on transparency if no information about where its viscose comes from was communicated to Changing Markets or is disclosed publicly. It was rated higher if it provided a full supplier list, including names of viscose suppliers and locations of factories on its website.

A company was rated lower on policy/commitments if no information about its viscose sourcing practices was communicated to Changing Markets or is accessible on its website. It was assessed based on the level of engagement, meaning it was rated higher if it engaged meaningfully with our questions on its viscose supply chain and set out a viable strategy towards responsible viscose sourcing.

To rate highly overall, companies needed to real and measurable signs of progress in line with the Changing Markets Roadmap towards responsible viscose & modal fibre manufacturing.

It is important to note that this table is not a ranking, but rather a categorisation of brands based on their responses to our letters and their publicly available viscose policies and disclosures. The 'Frontrunners' category consists solely of brands that signed up to the Changing Markets' Roadmap. They are listed according to the level of transparency they provide on their viscose supply chain. The companies in other categories are listed alphabetically.

5.5.1. Frontrunners

The 'Frontrunners' category consists of the ten brands that have signed up to the Changing Markets' *Roadmap*. These are listed in Table according to the level of transparency they publicly provide on their viscose supply chain.

Two new companies – New Look and Morrisons – have signed up to the *Roadmap* this year. They join the eight firms – ASOS, C&A, Esprit, H&M, Inditex, M&S, Next and Tesco – that signed up in 2018.

All the *Roadmap* signatories now have clear policies to address the environmental impacts of viscose production in their supply chain, although Next has yet to make its policy public. In particular, new signatory New Look has already published a detailed policy to account for the impacts of viscose fibre manufacturing.

The signatories vary more widely in the public disclosure of viscose suppliers on their websites, which showed a marked change this year. Esprit now discloses detailed information on all its viscose suppliers on its website, while ASOS, M&S and Tesco have all begun publishing the names of the factories providing the vast majority of their viscose.

Other signatories publicly disclose the names of their suppliers, but with less detail. C&A's website discloses its only three suppliers, but does not specify any factory names; nor does it outline plans to disclose these in the future. H&M, Morrisons, New Look and Next all provide the names of some or most of their suppliers, and say they plan to increase their disclosure level.

Inditex is the only *Roadmap* signatory that does not yet disclose its viscose suppliers on its website; however, the company said it will publicly disclose its four key viscose fibre producers after the publication of the Canopy *Hot button* report at the end of November 2019.

A number of signatories – including ASOS, Esprit, H&M, Next and Tesco – also mentioned the development of a Brand Man-made cellulosic fibres (MMCF) roundtable group, in which companies committed to the Changing Markets *Roadmap* together ask viscose manufacturers to disclose environmental information through a self-assessment questionnaire.

5.5.2. Could do better

Several other brands showed evidence of meaningful efforts to make their viscose supply chain more responsible.

This group includes several brands that previously failed to engage with us on their viscose fibre manufacturing, and did poorly in our report last year. Gucci was placed in the red zone in 2018, for example, but has improved its rank this year due to its parent group Kering's inclusion of viscose pulp sourcing and fibre manufacture in its 2025 sustainability strategy, and disclosure of the majority of its suppliers for the first time to Changing Markets.

Several brands newly contacted this year also reached this category. For example, German fashion retailer Bonprix said it is developing a plan to increase both its use of sustainable viscose and transparency in its viscose-production supply chain.

Some brands showed serious movement towards a more responsible and informed viscose supply chain via their pledges to move towards certain suppliers. Monsoon, for example, communicated that its next Spring/Summer collection will have over 500 options made from Lenzing Ecovero, representing over 60% of its range. Similarly, Lidl has committed to its own-brand textiles using only Lenzing Ecovero and EU Ecolabel-certified viscose by 2020, which accounted for 76% of viscose use in 2018. Tchibo said 78% of the cellulosic fibres used for its apparel and home textiles in 2018 came from Lenzing or Birla (LivaEco).

While these brands show encouraging signs of progress, they still need to disclose far more detail regarding their full viscose supply chain, and/or provide hard commitments and deadlines for improving their supply chains and transitioning to closed-loop production by 2023–25 at the latest.

5.5.3. Trailing behind

This category, which this year represents close to half of all companies contacted, was assigned to brands and retailers that have indicated some movement towards more responsible viscose sourcing. However, many either fail to address viscose fibre manufacturing completely (concentrating only on pulp sourcing, which is outside the scope of this report) or address it too vaguely to be meaningful.

In a welcome sign, several brands communicated plans to develop policies addressing viscose fibre manufacturing. Sainsbury's said it is currently developing a viscose-sourcing policy for its Tu clothing brand, which it said would be in line with the Changing Markets *Roadmap*. However, it did not give a timeline for either publishing this policy or disclosing its viscose suppliers. Mango likewise said it is currently developing a cellulose sourcing strategy, but gave no further information on this.

Another important caveat is that it is by no means certain that all upcoming viscose policies will fully encompass responsible viscose fibre manufacturing. Vero Moda's parent group, Bestseller, told us it is currently working on a MMCF Roadmap that will address '*many*' elements of the Changing Markets *Roadmap* – but did not say what it plans to leave out. Bestseller's response also appears somewhat misaligned with the aim, in its sustainability strategy,[40] to be '*circular by design*'.

Similarly, Fast Retailing, the parent company of Japanese brand Uniqlo, said it will have full traceability on its viscose suppliers by 2020, and may set targets for more environmentally friendly alternatives to cellulose fabrics, but gave no indication of plans to disclose suppliers.

Others said they already have internal policies addressing their viscose fibre supply chain, but fail to make any meaningful commitments on their websites. UK retailer Missguided, for example, said it has incorporated the requirements of the Changing Markets *Roadmap* into its (non-public) environment standards for its supply base, but its website does not even mention the need to source viscose more responsibly. Similarly, Hermès said it has a clear set of expectations regarding social and environmental standards for viscose suppliers and that it has kept a 'black list' of suppliers since 2017, based on the findings from Changing Markets' first *Dirty fashion* report. However, Changing Markets has never published a 'black list', or ranked viscose producers, and none of Hermès' stated commitments are publicly available. Such assurances from brands are misleading, and cannot be regarded as genuine commitments towards responsible viscose.

Mango communicated that it is currently developing a cellulose sourcing strategy but gave no further information on this.

In some cases, brands also gave inaccurate or confused information. Arcadia, the parent group of many well-known British high-street brands, such as Miss Selfridge and Topshop, said it already discloses its viscose fibre producers – but its public supplier list does not, in fact, include these.

5.5.4. In the red zone

The 26 worst-performing brands assigned to the bottom category this year are those with no viscose-specific policy of any kind.

Among the lowest-ranked companies, luxury brands Versace, Prada, Dior, Armani and Dolce & Gabbana rub shoulders with Boohoo, Walmart, Matalan, Forever 21 and TK Maxx. (iStock)

Most of these brands did not engage with Changing Markets in 2019, although a few did provide responses without outlining any policies covering viscose. For example, Amazon responded by outlining a range of sustainability initiatives, but did not indicate if or how these related to sourcing viscose more responsibly.

As was the case last year, the lack of policies from many luxury brands – including Armani, Dior, Dolce & Gabbana, Fendi, Prada and Versace – landed them squarely in the red zone.

Some brands – such as fast-fashion retailers Forever 21 and Boohoo, and luxury brand Dolce & Gabbana – have little in the way of environmental or supply-chain strategies at all, let alone a responsible sourcing strategy covering viscose.

Other brands have environmental policies of some kind outlined on their websites, but with no indication that these policies cover their viscose supply chains. For example, Debenhams has both a timber-sourcing policy and a supply-chain mapping programme to review the environmental impact of manufacturing, but neither mentions viscose.

Similarly, Gildan Activewear's social and sustainable compliance guidebook outlines plans to '*eliminate all substances and waste products*' known or suspected of being harmful to human health or environmental systems, but does not indicate whether this includes viscose fibre suppliers.

BOX 6: **Fast fashion: Too much for the planet to bear**

In common with many other sectors of the global economy, the growth of the fashion industry is placing unbearable strain on our planet's finite resources, as production booms and consumption outpaces population rise in many parts of the world.

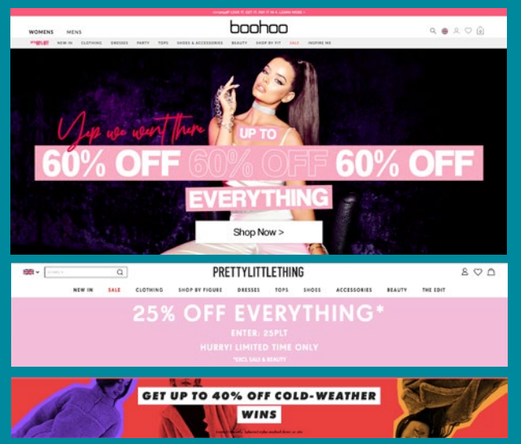
According to the UN, the global fashion industry is worth $2.4 trillion and employs approximately 60 million people worldwide, most of them women.[41] With the world's population expected to exceed 8 billion in the coming decade,[42] and the emergence of 'fast' and 'ultra-fast' fashion, based on a throwaway model of consumption, turbocharging discretionary purchases, the industry's environmental and social impacts are in sharper focus than ever before.

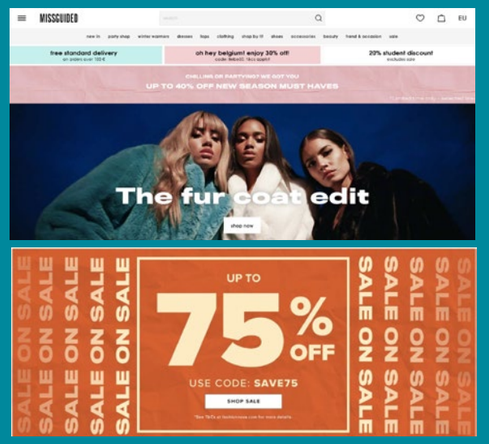
Textile production is a major contributor to climate change and industrial pollution. According to the UN, it is responsible for 20% of global industrial wastewater pollution and 10% of the world's GHG emissions.[43]

The full life-cycle impact of clothing globally is even greater. According to the University of Leeds, the industry has an annual carbon footprint of 3.3 billion tonnes CO_2e (CO2-equivalent),[44] which is close to the combined carbon footprint of all 28 current members of the European Union (3.5 billion tonnes).[45]

Clothing consumption is outpacing population growth in many parts of the world. By 2030, it is expected to rise by 63%, from 62 million tonnes to 102 million tonnes – equivalent to more than 500 billion additional T-shirts.[46]

For the most part, this growth does not reflect an underlying need for clothing, but is fuelled by brands' and retailers' huge advertising and marketing spend. Fashion houses spend billions of dollars a year marketing their products to consumers. For example, luxury group LVMH, which owns the Louis Vuitton and Dior brands, spent €5.6 billion ($6.3 billion) on marketing in 2018 – equivalent to 12% of group revenues.[47] The sector as a whole spends hundreds of billions of dollars globally on advertising its wares to consumers.[48]





Fast fashion is responsible for large amounts of landfill waste. According to Business insider, up to 85% of textiles go to landfill each year and the equivalent of one garbage truck full of clothes is burned or dumped on a landfill site every second. (iStock)

What is 'fast fashion'?

The Cambridge English Dictionary defines 'fast fashion' as 'clothes that are made and sold cheaply, so that people can buy new clothes often'.[49] *While 'fast fashion' itself is only a recent phenomenon, having emerged alongside the globalisation of apparel supply chains and improved logistics in the early 21st century, it is increasingly being supplanted by 'ultra-fast' fashion, which in some cases has brought unethical practices closer to home.50 According to the University of Nottingham's Rights Lab:*

'The emergence of fast fashion pioneers such as Zara and H&M [has] enabled garments to move from design to sale in as little as five to twelve weeks, significantly outpacing the six to twelve-month cycle of traditional retailers. More recently, with the emergence of social media and digital communications a "new breed" of fashion players have emerged: "ultra-fast" online brands including Boohoo, Missguided and Pretty Little Thing, which can bring products from design to sale in as little as one week.'[51]

Where fashion used to cycle through two seasons a year, 50–100 'micro-seasons' has become the new normal.[52] While most high-street shoppers will not follow each and every new trend, the acceleration of the fashion industry's output is clearly reflected in the amount of clothing the typical consumer possesses. For example, in 1930, the average American woman owned nine outfits. Today, she owns 30 outfits – one for every day of the month.[53] With the advent of online retail, shopping has never been easier, and the dopamine hit[54] associated with so-called 'retail therapy' is doubled as purchasers obtain pleasure from both ordering an item and opening it when it arrives.[55]

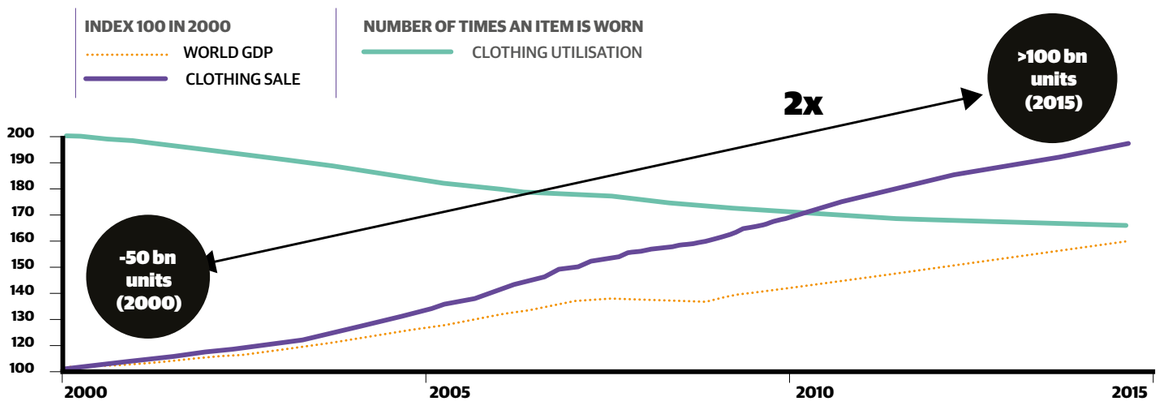


Figure 1. *Growth of clothing sales and decline in clothing utilization since 2000*

Source: *Wu, J.X. and Li, L. (2019) Sustainability initiatives in the fashion industry. IntechOpen, 6 August. [ONLINE] Available at: https://www.intechopen.com/online-first/sustainability-initiatives-in-the-fashion-industry.*

5.6. ZDHC guidelines for responsible viscose production

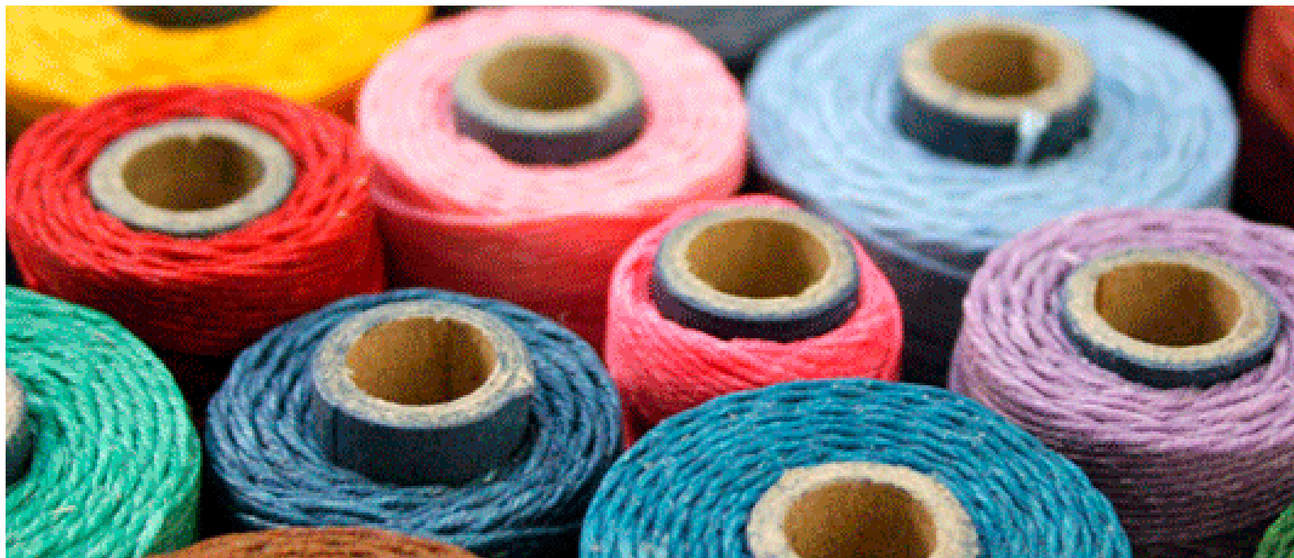
The ZDHC Roadmap to Zero Programme is an industry-led initiative that aims to eliminate hazardous chemicals from the textile, leather and footwear industries by 2020. The initiative has 150 members, 30 of which are brands and retailers (including Adidas, C&A, Esprit, H&M, Inditex and many others).[56] So far, ZDHC's work has largely focused on driving better chemical management and innovation in the dyeing and finishing of textiles, apparel, leather and footwear. However, in 2018, ZDHC announced plans to expand the scope of its work to raw-material production, starting with MMCF – including viscose, modal and lyocell. The aim is to provide a framework of guidelines for wastewater, sludge, waste and air emissions specific to man-made cellulosic fibre production, and to define expectations for achieving closed-loop commitments. The dissolving pulp-production process will be considered at a later stage.

ZDHC hosted its first multi-stakeholder roundtable on the issue in March 2018, gathering together 80% of MMCF producers (including Birla Cellulose, Lenzing Group and the Collaboration for Sustainable Development of Viscose), clothing brands, multi-stakeholder initiatives (such as the Partnership for Sustainable Textiles) and NGOs. In May 2018, Birla Cellulose and the Lenzing Group joined ZDHC as contributors.[57]

The MMCF guidelines will address wastewater, air emissions, chemical recovery and sludge. They will be finalised based on the implementation of pilots, collection of data from viscose suppliers and feedback from key stakeholders, and will take into account international and national regulations. The ZDHC will complete draft wastewater guidelines in November 2019, which will be made available for feedback from key stakeholders, and aims to launch the final guidelines by the end of 2020.

Changing Markets Foundation urges ZDHC to keep the level of ambition in the upcoming guidelines at minimum with EU BAT standards and the principles set out in the Changing Markets Roadmap.

The ZDHC's MMCF draft guidelines are to adopt a three-level approach – 'foundational', 'progressive' and 'aspirational' – to address suppliers' current levels of performance and capacity. However, the danger of a three-level approach is that some companies could remain at the foundational level, and fail to make headway, while still claiming they follow the ZDHC guidelines. For this reason, the ZDHC should introduce a measurable and time-bound requirement for continuous improvement. Members should be required to improve over time, and, as technology progresses, to consistently ramp up ambition towards the highest ('aspirational') level, according to predefined metrics. The ZDHC should also commit to addressing non-compliance by defining a set timeframe for each manufacturer to progress to the next level. Meaningful sanctions and exclusion criteria should be set for cases in which members consistently fail to meet these requirements.



For guidelines on chemical recovery, which will address closed-loop production of viscose fibre, the ZDHC is looking at both the EU BAT and the draft China Chemical Fibers Association (CCFA) standard (Scope and Calculation Methods of KPIs [Key Performance Indicators] for Sustainable Viscose Staple Fiber Production) used by the Collaboration for Sustainable Development of Viscose (CV) initiative. In conversation with the ZDHC, the Changing Markets Foundation expressed concerns about the CCFA, and why this approach is not ambitious enough to put the industry on a path towards meaningful transformation (see Section 6) – even as the basis for the lower level of ambition. We also underlined our position that the EU BAT is currently the most ambitious and comprehensive standard to address pollution in viscose fibre production, and was achieved over a decade ago by an industry frontrunner; thus, it should form the basis for the upcoming guidelines.

The ZDHC has been vested with the responsibility of setting ambitious and forward-looking standards for the industry that create an incentive for genuine sector-wide transformation to responsible viscose production. To live up to this responsibility, the ZDHC must be careful not to water down, but rather to build on, existing achievements – namely:

1. Leading players – including Lenzing and Aditya Birla, which together account for more than 37% of the viscose market58 – have already committed to closed-loop production, in line with EU BAT, by 2023–25.

2. An increasing number of global clothing brands had pledged to only source from viscose producers committed to achieving EU BAT, and to comply with the Changing Markets *Roadmap*.

The ZDHC can play a crucial role by providing consistent measuring and recording of pollution parameters in viscose fibre production, so that manufacturers around the globe can implement the best available technology. The Changing Markets Foundation urges ZDHC to keep the level of ambition in the upcoming guidelines high; specifically, they should be in line – at minimum – with EU BAT standards, and the principles set out in the Changing Markets *Roadmap*.

Dirty Fashion Disrupted: Leaders and laggards revealed

6. Where do viscose manufacturers stand?

Since the publication of our *Dirty fashion* report in 2017, and the *Roadmap towards responsible viscose and modal fibre manufacturing* in 2018, global viscose producers have taken different approaches to addressing their environmental and social impacts. This section aims to analyse the commitments and actions implemented by the majority of the world's leading viscose producers in the transition to responsible viscose – specifically, Lenzing, the Aditya Birla Group (ABG), members of the Chinese CV initiative and ENKA.

Lenzing and ABG, which have continued to engage with the Changing Markets Foundation in their transformation towards closed-loop viscose production, will be assessed based on measures taken at sites investigated in both the *Dirty fashion* and *Dirty fashion revisited* reports: Lenzing's South Pacific Viscose (SPV) plant in Purwakarta (Indonesia), and ABG's units in Nagda (India) and PT Indo Bharat Rayon (IBR) plant in Purwakarta.

Our analysis is based on publicly available documents and information the companies shared as part of an ongoing dialogue with the Changing Markets Foundation. Every section will evaluate each producer's performance on key points of our *Roadmap*.

Viscose fabric (iStock)

6.1. Lenzing

6.1.1. Environmental permits and compliance with relevant national and local regulations

According to Lenzing's code of conduct,[59] the company is committed to operating its sites worldwide in compliance with all applicable local environmental laws, regulations or ordinances. Lenzing states that bypassing any environmental controls or monitoring device is strictly prohibited, and the company '*promptly reports*' environmental incidents or behaviour that might interfere with environmental laws or any of their environmental standards.[60] This responsibility is extended to suppliers, which, in order to do business with Lenzing, are expected to abide by the Global Supplier Code of Conduct and all applicable laws. [61]

In 2018, Lenzing shared with the Changing Markets Foundation an overview of permits for operation of its SPV plant in Purwakarta, Indonesia, which it says are still in place.

6.1.2. Appropriate chemical-management systems, with the ultimate goal of moving towards closed-loop production

In 2018, Lenzing updated its Group Environmental Standard, which is based on EU BAT (see Box 2), as well as the EU Ecolabel. Its production sites in Lenzing (Austria) and Nanjing (China) already meet EU BAT, and have also been awarded the EU Ecolabel certification. The SPV plant in Indonesia does not yet perform in line with EU Ecolabel requirements or EU BAT.

According to the information Lenzing provided, over the next five years, the company intends to invest over €100 million in '*extending its environmental leadership*'. Its global focus areas are expanding sulphur recovery, further improving water management and greening up the energy mix (see section 5.1.4).

To address air and water emissions at Lenzing's sites, the company requires all sites to comply with the Group Environmental Standard (which is aligned with EU BAT) by 2022. As part of the sustainability targets, '*specific*' sulphur emissions[B] must be reduced by 50% by 2022, and group chemical oxygen demand emissions by 20% by 2022 (baseline 2014).[62]

Regarding the SPV plant in Indonesia, which the Changing Markets Foundation investigated (and which featured in the *Dirty fashion* report in 2017), Lenzing claims emissions have been significantly reduced in the past year through continuous improvement measures. As SPV makes by far the largest contribution to the group's sulphur emissions,[63] several improvement efforts focused on this site. The first half of 2019 witnessed a drop in sulphur emissions (carbon disulphide and hydrogen sulphide) from 2018, but the company still has a long way to go to bring the SPV plant in line with EU BAT levels by 2022. To achieve its overall sulphur reduction target by 2022, Lenzing is looking at different measures, including investing in an additional Carbon Disulphide Adsorption Plant (CAP) at SPV[64]

According to Lenzing, sulphur dioxide (SO_2) emissions at SPV meet all legal requirements. The company has implemented technology to reduce SO2 emissions in the flue gas of the power plant's boilers at the site.

Lenzing's SPV site is also slowly making progress in reducing COD emissions to water. A project was launched in 2018 to improve the wastewater situation at the site. This will include upgrading the capacity of one of the two existing Waste Water Treatment Plants (WWTP) in Indonesia by 2022, upgrading the sewage plant to ensure sewage treatment is in line with local requirements, treating utility water streams, and improving current storm-water drainage systems so that all storm water goes through the WWTP.

Apart from viscose production, Lenzing is building a lyocell plant in Thailand, which was approved in June 2019. With an initial investment of €400 million, Lenzing plans to build a 100 kilotonne production line, which it aims to complete by the end of 2021.

6.1.3. Measures to protect workers and local inhabitants from exposure to dangerous chemicals

Lenzing has a policy for safety, health and environment (SHE),[65] and its code of conduct66 states the company is committed to operating its sites worldwide in compliance with all applicable safety, health and legal requirements, and external and internal standards, going beyond compliance with relevant industry standards.

In 2018, the first Institute of Occupational Safety & Health managing and working safely courses were held at Lenzing; these were tailored to the respective site languages, globally, to allow delivery in any country.

The company monitors the safety performance of its sites through the implementation of a standardised computer-based reporting system known as SHEARS (Safety, Health, and Environmental Action and Reporting System). To date, 47,872 reports have been entered into the system (the start date is not specified). Lenzing states that 2018 witnessed the same injury rates compared to previous years (2016 and 2017). No fatal injuries were registered in 2018.[67]

Lenzing states that basic healthcare services are available at all its sites, with the aim of compensating for the deficits in the health systems of the various countries it operates in.[68] Lenzing says it uses medical partners in the areas where its production sites are located to offer its employees diagnosis and therapy services tailored to local needs. The type of medical services available varies between sites, and includes healthcare services for family members at a clinic in the vicinity of the SPV production site in Purwakarta, Indonesia. According to Lenzing, SPV also has its own outpatient clinic, with medical staff, for treatment of acute conditions and injuries on site, as well as its own ambulances to ensure prompt follow-up treatment at specialist medical facilities.

6.1.4. Energy efficiency and GHG emissions reduction goals

One of Lenzing's key focus areas is 'greening up the energy mix', and it has committed to following science-based targets for reducing CO_{2e}missions. In line with this pledge, Lenzing has joined the Science Based Targets Initiative – a collaboration between the Carbon Disclosure Project, the United Nations Global Compact, the World Resources Institute and the World Wide Fund for Nature (WWF), and one of the We Mean Business Coalition commitments – which defines and promotes best practice in science-based target setting.[69]

More specifically, Lenzing has committed to a net-zero CO_2emissions target by 2050, with a milestone of reducing '*specific*' CO_{2e}missions, per metric tonne of sold product, by 50% by 2030 (compared to a 2017 baseline). According to Lenzing, the company will invest over €100 million in mitigating 1.3 million tonnes of CO2 emissions over the coming years, both inside its operational boundaries (scopes 1 and 2) and in its supply chain (scope 3).[70]

Lenzing told Changing Markets it plans to move away from using coal to generate power at some of its sites. At its Nanjing site in China, it is switching from coal-fired to natural gas-fired boilers. [71] Lenzing also indicated it is looking at reducing reliance on coal at its SPV plant in Indonesia.

B Lenzing defines 'specific' emissions as: 'emissions per unit of Lenzing Group production (i.e. pulp and fiber production volumes)'. See: Lenzing (2018) Partner for change: Lenzing Group sustainability report 2018, p.21. [ONLINE] Available at: https://www.lenzing.com/index.php?type=88245&tx_filedownloads_file%5bfileName%5d=fileadmin/content/PDF/04_Nachhaltigkeit/Nachhaltigkeitsberichte/EN/NHB_2018_EN.pdf.

Dirty Fashion Disrupted: Leaders and laggards revealed

6.1.5. Actions to remediate environmental damage in the surrounding environment

According to Lenzing's 2018 sustainability report, '*the leadership teams attach great importance to good relationships with their neighbours, and they are committed to dealing with all complaints fairly and impartially*'.72 As the company reports, clear complaints procedures exist at all sites, with a dedicated community department at SPV site in Purwakarta, Indonesia, and regular information-exchange meetings at all other sites.73 Site managers, senior managers and local SHE managers are accessible to the local community as part of the complaints procedures. All complaints cases are registered, and efforts are made to resolve the issues in each case. They are also reviewed at the monthly Global SHE meetings (attended by representatives of all sites) and referred to in executive summaries distributed to the board. None of these documents are publicly available.

In 2018, complaints were registered at the company's sites in Indonesia (SPV), Austria (Lenzing) and Czech Republic (Paskov). According to Lenzing, appropriate measures were implemented to deal with them, and, as of 31 December 2018, there were no pending legal disputes relating to conflicts between local residents and Lenzing companies or subsidiaries.

6.1.6. Transparency and independent audit

According to Lenzing, many different types of third-party audits are implemented on a regular basis (ISO 9001, ISO 14001, ISO 45001 in transition from Occupational Health and Safety Assessment Series, Clean & Hygiene, FSC and others), as well as internal audits by trained internal auditors. Quality Austria conducts EU Ecolabel verification audits. All audits are managed on internal share point through the company's electronic audit-management system, where findings are registered and corrective actions monitored. Lenzing did not provide information about a third-party audit that would verify compliance in line with EU BAT and the Changing Markets *Roadmap*.

Lenzing has initiated a number of projects to increase transparency in its supply chain, with the aim of tracing its fibres from manufacture to end product. Ecovero, Lenzing's EU Ecolabel-compliant fibre, can be traced from the final product directly back to Lenzing's production sites through a chemical-based fibre-identification system. Lenzing is also exploring digital traceability by partnering with Hong Kong-based company TextileGenesis. Through blockchain technology, Lenzing plans to offer supply-chain traceability for a variety of its fibres, starting with its Tencel-branded fibre business.[74] The idea is to provide transparency from wood to garment through a QR code. Lenzing expects the platform to be fully operational as of 2020.

Lenzing also began implementing the Higg Facility Environmental Module (FEM) 3.0 at its sites in 2018 and throughout 2019. The company told Changing Markets it had identified various issues that Higg FEM will need to adjust to the specifics of the wood-based cellulose fibre-production process. For 2019, Lenzing said it will not share the training results within the Higg community.

So far, under the Higg Index, there has been no obligation for facilities to publish their results. However, the *Higg Index roadmap to transparency* has set an objective of achieving '*full transparency*', by 2020, by releasing the Higg data.[75] Regardless of this, we urge viscose producers such as Lenzing to be transparent about their progress in order to facilitate monitoring by external stakeholders.

Dirty Fashion Disrupted: Leaders and laggards revealed

6.2. Aditya Birla Group

6.2.1. Environmental permits and compliance with relevant national and local regulations

In the information ABG shared, at the request of the Changing Markets Foundation, the group states all its sites are compliant with the applicable regional and national environmental regulations. The annual report (financial year 2018–19) of Grasim Industries, a subsidiary of ABG and the sole producer of viscose staple fibre (VSF) in India, also reaffirms that the company continuously monitors regulatory changes to ensure compliance with all applicable statutes and regulations.[76] According to the group, legal compliance is tracked on a monthly basis by a compliance system, which maps all the legal requirements, and monthly compliance reports are monitored at site level by senior management, including the managing director.

ABG said its fibre-production unit at Nagda in Madhya Pradesh plans to install a 'Zero Liquid Discharge' system by 2021, in line with the operation permits received by the site. The project plan has been prepared and is being implemented.

6.2.2. Appropriate chemical-management systems, with the ultimate goal of moving towards closed-loop production

As reported last year in our *Dirty fashion* report, ABG has committed $170 million (approximately €146 million) of investment to progressing towards EU BAT technologies at all seven of its existing viscose fibre-producing plants, which are located in India, Indonesia, China and Thailand. Its commitment is to install the technologies required to meet EU BAT at all its fibre-production sites, and to achieve those parameters by the end of 2022 at all its sites, except for sulphur release to air. For sulphur release to air, it aims to achieve Ecolabel norms (30kg per tonne of fibre) at all sites by 2022, and to optimise the process further to achieve the EU BAT norms of 12–20kg per tonne of fibre. However, it does not specify when this objective will be achieved.

ABG told us its subsidiary, Birla Jingwei Fibres Company Limited (BJFCL) in China, is already compliant with EU BAT as a result of investments in carbon disulphide (CS2) recovery. According to the information it shared with us, the technologies to achieve the EU BAT limits of 12–20kg per tonne of fibre were installed and commissioned in August 2019. Within the first month of operation, the plant achieved the EU Ecolabel norms of less than 30kg per tonne of fibre release to air. The CS2 recovery system (CAP) was further optimised in September 2019; since then, the plant has been operating within the EU BAT norms. The plant is continuing the effort to further optimise the parameters, and hopes to reduce emissions further.

The group also disclosed that its Nagda site in India, which the Changing Markets Foundation investigated by, now meets the EU BAT values for wastewater pollution for both COD and zinc, but is not yet compliant with limits for air pollution. The Nagda site has installed membrane technology to recycle wastewater and multi-effect evaporators to recover more salts, with investments of more than $25 million over the past four years. In addition, ABG states it is channelling approximately $25 million into the installation of a Zero Liquid Discharge system at Nagda. The group also reports that the Nagda site has reduced wastewater discharges by 50% over the past few years, using a closed-loop approach based on reducing, reusing and recycling water. ABG plans an expansion of VSF and lyocell capacity at Nagda, on top of a newly commissioned lyocell plant at Kharach in Gujarat, which will more than double ABG's lyocell capacity.

According to information ABG shared with us in May 2019, the group's PT IBR unit in Indonesia still needs to reduce CS2 emissions, COD and zinc emissions to water if it is to comply with EU BAT values. ABG did not provide further details on the precise values achieved at this plant.

Regarding its other viscose-production sites in India and Thailand, ABG told Changing Markets that its Kharach unit in Gujarat recently achieved COD limits in line with EU BAT. At its Thai Rayon (TRC) plant, ABG said the CS2 recovery units are currently only compliant with the EU Ecolabel norm, but the technology has been installed to bring it in line with EU BAT. Finally, at its Vilayat site in Gujarat, ABG said it will invest $500 million in setting up two new lines, which are to be designed and operated in compliance with EU BAT.

6.2.3. Measures to protect workers and local inhabitants from exposure to dangerous chemicals

According to its annual report, Grasim Industries implements critical safety standards across its units and project sites, and ensures all employees are provided with safety training – both as part of their induction programme and on an ongoing basis – to build a culture of safety across its workforce. At group level, the company has a policy on SHE that extends to all subsidiaries.[77] According to information ABG shared, health and safety performance is directly monitored by the Business Executive Committee, headed by its managing director, and the Apex Safety Committee, headed by its chief operating officer. Both its Nagda and IBR units are OSHAS 18001 certified.

ABG told the Changing Markets Foundation an annual health check-up is mandatory for all workers. This includes examination by a doctor and clinical tests (such as X-ray, blood tests and urine tests) to identify any abnormal symptoms. All sites have Occupational Health Centres, which function 24/7 and are managed by trained nurses and visiting doctors.

In 2018, ABG installed three continuous ambient air quality monitoring systems (CAAQMS) around the Nagda unit to monitor gas exposure within and around the site. These CAAQMS are connected online to the state pollution control board's Environmental Surveillance Centre. According to ABG, third-party monitoring of ambient air quality is carried out on a quarterly basis by government-approved laboratories, the National Accreditation Board for Testing and Calibration Laboratories (NABL) and a Ministry of Environment and Forests-accredited laboratory. The area tested includes ambient air inside the plant and in the area surrounding the plant, although it is not clear how extensive the testing is.

While Grasim Industries in Nagda has a statutory requirement to display ambient air quality values, there is no such regulation in Indonesia. However, ABG has extended this practice to its IBR plant in Purwakarta. It shared some testing results from its Nagda and IBR plants from June and July 2019, as well as photos of monitoring displays at the entrance to IBR. The tested parameters included carbon disulphide, hydrogen sulphide and sulphur dioxide.

6.2.4. Energy efficiency and GHG emissions reduction goals

Birla Cellulose, ABG's umbrella brand for viscose fibre products, has evaluated its carbon footprint for the financial year 2018–19. According to ABG, verification carried out by Ernst and Young India shows that all seven of Birla Cellulose's viscose fibre-production sites and all four of its pulp-production sites are 'carbon positive' in scopes 1 and 2. This is attributed to the sequestering of carbon in forests that Birla Cellulose directly manages. ABG claims this makes it the first 'carbon neutral' viscose producer for scope 1 and 2 emissions. It is currently undertaking a comprehensive scope 3 evaluation and focusing on offsetting these emissions. It is important to note here that there is considerable controversy surrounding carbon offsetting (including forestry sequestration) and the UN recently warned that carbon offsets should not be considered a 'get-out-of-jail-free card.'[78] Therefore, preference should always be given to reducing emissions at source.

In an exchange with the Changing Markets Foundation, ABG stated it has reduced energy intensity at its fibre-production units by 5% in the past five years. It plans to reduce it by another 5–10% in the '*coming period*', but failed to specify a timeframe for this. The reduction will be achieved through increased use of renewable energy in the group's production plants, selection of suppliers with a lower carbon footprint for key raw materials and working on increasing forest cover.

Grasim Industries is moving away from the use of coal at some sites; for example, it is using solar power at its Karwar plant in Karnataka, and wind energy at its Karwar and Vilayat plants.[79]

ABG's IBR plant in Indonesia displaying ambient air quality values.

ABG shared photos showing the ash dumping site in Nagda, has been transformed into a plantation.

6.2.5. Actions to remediate environmental damage in the surrounding environment

The company said grievance procedures are in place at its sites, though it is not clear whether this covers all facilities. It provided grievance registers, with concerns and requests raised at Nagda and PT IBR, and information about how these have been addressed. In 2018, ABG explained to Changing Markets that a plant's Stakeholder Officer investigates grievances. However, to date, none of the records – including grievance forms, investigation notes, interviews and minutes of meetings – are in the public domain.

ABG told Changing Markets that the ash-dumping site in Nagda, reported on in our *Dirty fashion* report, has been completely capped with soil and transformed into a plantation. ABG provided us with a picture of this.

ABG also commented on two complaints raised by communities against its Nagda and IBR sites, and explained how the company addressed the concerns:

- In April 2019, Nagda residents lodged complaints with local authorities about the expansion of Grasim Industries. Local contacts shared a press release with Changing Markets, which raised concerns that the envisioned facility is too close to dwellings, that the location is not clearly defined and that expansion of the plant will lead to further air, water and land pollution, deprive farmers of their rights and impact on local people's health. ABG responded by saying the public hearing on the expansion was conducted by the District Authorities in September 2019 and involved around 400 stakeholders. ABG claims the community and stakeholders '*at large*' welcomed the expansion, and was of the opinion it would foster economic and social development in the area. The Unit Head of Nagda responded to the highlighted grievances, and, according to ABG, the hearing ended with support from the community and stakeholders, including the statutory bodies and government administration. We did not receive further reports from the ground, but ABG, as well as the companies buying from it, should ensure the group has taken appropriate measures to address the concerns, linked to Grasim Industries' expansion, raised by local communities.
- According to ABG, complaints were raised against IBR regarding the construction of a WWTP and a landfill site in Indonesia. IBR was questioned on whether it possessed permits for the two facilities, and, according to ABG, two local NGOs (PP and Kompak) threatened to sue IBR. In August 2019, ABG met with the '*Spatial Planning office and Residential*', journalists and NGOs to present evidence that IBR had followed procedures. ABG stated that, as a result of this, the NGOs did not take steps to sue IBR, and local media channels *RMOL*[80] and *Pasundan Express*81 reported that '*construction of the Waste Water Management Treatment plant (WWTP) and Land Fill facilities in the company are in accordance with procedures*'. 82 However, recent media reports indicate that hundreds of demonstrators, including representatives of four local NGOs, gathered in front of the

IBR site in September 2019, challenging the permit and calling for the clean-up of Kalimati swamp, which is located in the vicinity of IBR.83 According to the reports, a demonstrator said IBR is failing in its obligation to carry out an annual clean-up – despite an order from Indonesia's Supreme Court – and the waste generated presents a danger for the entire community. According to ABG, the company has prepared a plan for the clean-up of Kalimati, in consultation with Indonesian Environment Ministry (KLH) officials. At the time of writing, ABG said it had submitted plans to the Minister of Environment for final approval, and was awaiting permission to start the clean-up.

In India, ABG has commissioned a study from consulting organisation MPCON Ltd, in 35 villages around its Nagda site, to gain an understanding of the education, health and employment status of the villages and contribute to the social and economic development of underserved communities. The first phase finished in May 2019.

Birla Cellulose also commissioned research from Environmental Resources Management (ERM) on community impacts of its operations at Nagda, including regulatory compliance, wastewater, agricultural productivity, ground water, air quality and industrial hygiene. According to ABG, the scope of the study encompasses 150,000 people. Although the research highlighted villagers' reports of ground-water contamination and soil degradation, ABG stated this was not linked to viscose production at Nagda. Based on the audit findings, an action plan was developed and shared with the Changing Markets Foundation, which includes: a study on the impact of effluents on agricultural productivity with the Indian Institute of Soil Science (Bhopal); sealing the four older machines at Nagda to prevent fugitive emissions, such as hydrogen sulphide; exploring the feasibility of a mobile app-based grievance-handling mechanism; and independent quantitative exposure assessment (QNEA) for workers exposed to high levels of waste gas.

6.2.6. Transparency and independent audit

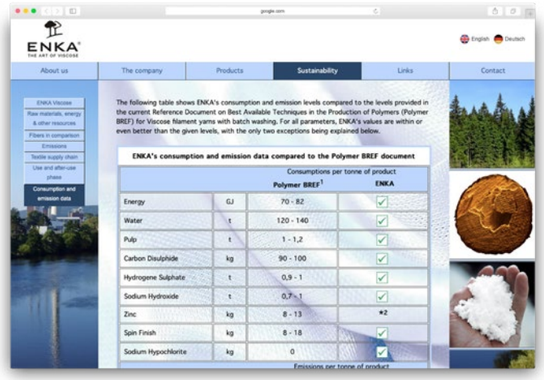
In addition to the ERM study, the main findings of which were shared with the Changing Markets Foundation but not made publicly available, ABG is using Higg FEM 3.0 to establish chemical-management practices and verify performance at all its sites.

According to the company, Thinkstep Germany audited four sites in 2018 and three in 2019 to verify implementation of the Higg FEM 3.0 framework. The third-party-validated reports for four sites are already available on the Sustainable Apparel Coalition (SAC) website; the remaining three sites will complete the audit by the end of the October 2019, and the validated result will subsequently be posted. However, access to FEM results is available only to SAC members, meaning it is not in the public domain. The results ABG shared with the Changing Markets Foundation indicate improvement at all sites.

ABG plans to carry out third-party audits, to verify compliance with EU BAT and EU Ecolabel requirements, as and when the sites complete the installation of EU BAT technologies and achieve the performance levels. The Changing Markets Foundation urges ABG to ensure independent audits are carried out regularly, not just once EU BAT performance levels are achieved. An audit of ABG's BJFCL plant in China by Sustainable Textile Solution (STS) confirmed that it meets the EU BAT parameters.

6.3. ENKA

ENKA is a German-based manufacturer of viscose filament yarn (VFY) under the trademark ENKA®Viscose. Filament yarn represents a small share of the viscose market (17.65%) compared to the dominant VSF.84 VFY is a spun thread ready for weaving into textiles, while staple fibres are cut into short pieces after the spinning bath and can be blended with other fibres into textile yarns or processed into 'non-woven' products later on.



ENKA took a step further on transparency, by publishing its consumption and emissions data online

ENKA's filament yarn is used to manufacture high-value garments, including viscose garments for luxury brands, as well as for medical or technical end uses.[85] During the course of 2019, ENKA has engaged with the Changing Markets Foundation regarding the environmental performance of its viscose fibre production. As explained in Box 2, EU BAT does not cover best practice for filament yarn production, but the EU BREF on Polymers provides emission and consumption data for VFY production processes submitted by the European Man-Made Fibres Association (CIRFS) in 2004.[86] We consider compliance with these values an indicator of good practice.

In exchanges with the Changing Markets Foundation, ENKA declared its commitment to closed-loop production of viscose, and disclosed how its emission and consumption levels compare with the values set out in the BREF document. **On transparency, ENKA goes a step further than other viscose producers by disclosing on its website[87] how its environmental performance matches the BREF values. This approach should be adopted by other global viscose producers to allow third parties to monitor manufacturers' performance.**

6.4. Chinese viscose industry

再生纤维素纤维行业
绿色发展联盟
COLLABORATION FOR SUSTAINABLE DEVELOPMENT OF VISCOSE

In light of strengthened law enforcement in China, and the acceleration of government inspections, many of the country's textile manufacturers have started cleaning up their production in recent years. The Chinese NGO IPE reports that, during 2019, China's private sector greatly enhanced its environmental performance. The government's targeting of thousands of factories operating out of compliance with the law, and its continued release of compliance records and pollution-discharge data, also boosted supply-chain oversight. [88]

With heightened sector-wide supervision and enforcement, viscose producers have come under strict scrutiny throughout the entire process – from planning and construction to production and operation – and non-compliant companies have been faced with high fines or the closure of their facilities.[89] In response, an industry-led initiative has been created to develop a more sustainable viscose-manufacturing industry in China. This initiative – the Collaboration for Sustainable Development of Viscose (CV) – brings together China's leading viscose producers, which collectively account for more than half of global VSF production.

The CV promises to provide a sustainability pathway for the Chinese viscose industry, and to drive real market transformation. However, as we concluded in our November 2018 report, *Dirty fashion: Spotlight on China*, the initial approach from the CV – which committed its members to adopt and implement a three-year *Roadmap* – falls short of what some viscose producers are already achieving, or have committed to achieving in the coming years.90 Our analysis highlighted the CV *Roadmap*'s lack of ambition, given that it only obliges its members to achieve the lower levels[C] of the so-called Clean Production Standard (CPS) – a standard based on the Chinese government's recommendations – rather than making viscose producers align with EU BAT, which is the approach supported by several leading fashion brands and retailers.

C The CPS defines three levels, with Level I being the most ambitious. Level I signals an 'internationally advanced' level of cleaner production, Level II a 'domestic advanced' level of cleaner production, and Level III a 'domestic basic level' of cleaner production.

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绿色发展联盟
COLLABORATION FOR SUSTAINABLE DEVELOPMENT OF VISCOSE

CHINA CHEMICAL FIBERS ASSOCIATION | CHINA COTTON TEXTILE ASSOCIATION | TANGSHAN SANYOU | FUNING AOYANG | YIBIN GRACE | SHANDONG YAMEI

SATERI | ZHEJIANG FULIDA | JILIN CHEMICAL FIBRE | HENGTIAN HELON | XINXIANG BAILU CHEMICAL FIBRE | SHANDONG YINYING

Since the publication of our report, the CV Secretariat has engaged with the Changing Markets Foundation to share updates and progress. In January 2019, the Secretariat indicated the CV would consider the recommendations put forward in our report and aim to raise ambition towards reaching EU BAT. The Secretariat said CV intends to promote the implementation of the three-year CV *Roadmap* by 2020, and is preparing a new five-year *Roadmap* - *CV Roadmap 2025* - to set future goals for the industry.

In principle, it is commendable that the CV is aiming for a greater level of ambition from 2020 on. However, according to information shared with Changing Markets, the upcoming five-year *Roadmap* (to 2025) does not appear to include significant improvements. Apart from a laudable step to modify limits on the sulphur recovery rate, in line with the EU BAT, for the moment the new *CV Roadmap* is very much based on the same standards presented in its initial one.

Even though the CV is still working to finalise its new five-year plan and define the exact level of ambition, we have significant concerns about the decision to keep the same limits for emissions to water, as presented in the lower level (Level II) of the CPS. As shown by the CV Secretariat's own assessment in the *CV sustainability report*,[91] out of the key emission indicators, only one of the limits set by the *CV Roadmap* is consistent with the EU BAT levels (see Table 2). This means none of the limits on emissions to water are consistent with EU BAT.

The *Sustainability report*[92] is therefore misleading in stating that: '*The comparison demonstrates that there is a high degree of overlap between the EU BAT and the CPS in terms of key technical indicators, indicating that there is a basic consensus on the environmental performance management of the industry globally*'. The table also compares some of the EU BAT limits to Level I of the CPS, which CV members are not obliged to achieve.

The Secretariat disclosed, in communication with the Changing Markets Foundation, that that it is still working on completing the new standard, which leaves space for CV to move in any direction. We strongly encourage the CV to adopt a robust approach to responsible viscose production, in line with the requirements of the CanopyStyle commitment and EU BAT, as reflected in our *Roadmap*. While the CV indicates in its *Sustainability report* that the EU BAT is non-implementable, two other viscose fibre producers in China have already achieved pollution limits in line with EU BAT: Lenzing's Nanjing plant and, more recently, ABG's Jingwei Fibres Company Limited (BJFCL).

As long as the CV relies on the CPS to address challenges in viscose fibre production, and does not adopt standards or values at minimum in line with EU BAT, stakeholders in the textile industry should not consider CV's approach as proof of good environmental performance or responsible production methods.

NO.	ITEM	UNIT	EU BEST AVAILABLE TECHNIQUES (EU BAT)	CV ROADMAP		COMPARISON RESULT	
				INDICATOR VALUE	SOURCE		
	CONSUMPTION PER TON OF PRODUCTS						
1	Comprehensive energy consumption	GJ	20-30	≤ 28[11]	Cleaner production (Level I)	Key indicator Consistent	
2	Water consumption	m^3	35-70	≤ 45[12]	Cleaner production (Level I)	Key indicator Consistent	
3	Cooling water	m^3	189-260	--		Not specified	
4	Pulp	t	1.035-1.065	≤ 1.010	Cleaner production (Level I)	Better than EU BAT	
5	CS_2	Kg	80-100	≤ 80	Cleaner production (Level I)	Better than EU BAT	
6	H_2SO_4	t	0.6-1	≤ 0.72	Cleaner production (Level I)	Consistent	
7	NaOH	t	0.4-0.6	≤ 0.47	Cleaner production (Level I)	Consistent	
8	Zn	Kg	2-10	≤ 4	Cleaner production (Level I)	Consistent	
9	Oiling agent	Kg	3-5	--		Not specified[13]	
10	NaOCl	Kg	0-50	--		Not specified[14]	
	EMISSION PER TON OF PRODUCTS						
11	Sulfur emitted into the air	kg	12-20	≤ 18.915	Cleaner production (Level I)	Key indicator Same	✓
12		g	200-300			Not specified	✗
13		g	10-50	Under development	ZDHC	Not specified[16]	✗
14	Chemical oxygen demand (COD)	g	3000-5000			Not specified[17]	✗
	SOLID WASTE						
15	Hazardous waste	kg	0.2-2	--		Not specified[18]	✗
	NOISE						
16	Noise at factory boundary dB(A)	dB(A)	55-70		Compliance Review Emission standard for industrial enterprises noise at boundary (GB12348-2008)	Consistent	

Table 2. *CV Roadmap vs. EU BAT*

Source: *CV Sustainability Report*

BOX 7: **Why is it crucial for the Chinese viscose sector to ramp up its ambition?**

China is the world's top viscose producer, accounting for around 66.17%[93] of global viscose fibre market share. The industry, once concentrated in North America and Europe, shifted to Asia in the late 20th century as a result of its cheaper labour costs and looser environmental protection rules. In the first decade of the 21st century, China quadrupled its viscose-production capacity.[94]

There are many concerns surrounding the Chinese viscose sector. For one, some of the companies leading the CV initiative have been at the centre of pollution and irresponsible wood-pulp-sourcing scandals, exposed by both the Changing Markets Foundation and Canopy. For example,

Sateri has been repeatedly awarded the 'red and yellow shirt' in Canopy's *Hot button* report due to confirmed high risk of sourcing from ancient and endangered forests and/or controversial landscapes.[95] The company is a subsidiary of Royal Golden Eagle (RGE), owned by Indonesian billionaire Sukanto Tanoto, which recently announced plans to invest $200 million in cellulosic textile fibre research and development over the coming decade.[96] According to a market analysis report, 70% of the investment will be spent on scaling up cleaner technology in fibre manufacturing, 20% to bringing pilot-scale production to commercial scale, and the remaining 10% to research and development.[97]

Another subsidiary of the RGE group, Asia Pacific Resources International (APRIL), which is Indonesia's second largest pulp and paper company, has also come under attack from the international community for clearcutting thousands of hectares of rainforest to feed its pulp mills.[98] While acknowledging that the company has made some progress, Canopy noted ongoing concerns about Sateri's sourcing in October 2019, due to APRIL group's continued operations on peatlands and sourcing from ancient and endangered forests and controversial regions, leading to unresolved social and environmental conflicts.[99]

Several members of the CV initiative who were found to be dumping untreated wastewater and releasing air pollutants exceeding local or national environmental standards during our 2017 investigation – including Sateri, CHTC Helon and Shandong Silverhawk – also have a poor Canopy ranking.[100]

During our 2017 investigation into Chinese viscose production plants, we found evidence of extreme water pollution and air pollutants exceeding local or national environmental standards.

7. Government regulation and voluntary schemes

Global textile supply chains are currently under-regulated. However, there is increasing recognition of the responsibility of clothing brands to address social and environmental issues in their supply chains. In the EU, this is reflected in national and transnational initiatives, which nonetheless remain limited, fragmented and, in some cases, not specific enough to textile supply chains to be effective.

Several national initiatives have seen the light over the past five years, including the French law on the duty of vigilance,[101] the UK Modern Slavery Act102 and the Dutch Child Labour Due Diligence law,103 as well as multi-stakeholder agreements, such as the Dutch Agreement on Sustainable Garments and Textile104 and the German Partnership for Sustainable Textiles.105 While these initiatives are to be welcomed, tackling environmental and social violations in global fashion supply chains requires an approach that goes beyond national borders; otherwise, these efforts will remain too scattered to address the full scale of challenges within the sector.

At the EU level, the only relevant regulations are not specific to the textile industry, and include directives on waste, packaging waste and landfill under the circular economy package. However, there are increasing calls for EU legislative measures to address the specific issues within the garment industry. In 2017, the European Parliament adopted a resolution that calls on the European Commission to propose binding legislation on due diligence for supply chains in the garment sector, based on the OECD guidelines on Responsible Supply Chains in the Garment and Footwear Sector, but the Commission has, to date, failed to table a legislative proposal for a due diligence system.[106]

In March 2019, the European Parliament's informal working group on Responsible Business Conduct launched a Shadow EU Action Plan on Responsible Business Conduct, which included the adoption of mandatory human rights due diligence legislation.[107] Such a law would require companies to carry out checks on their supply chains and look at the risks their activities may pose to human rights. The plan's implementation will be reviewed in 2022.

Owing to increasing discussions on the need for fashion transformation based on circular economy principles, and in light of many brands committing to increasing the share of garments and footwear made from recycled post-consumer textile fibres through the Global Fashion Agenda 2020 Circularity Commitment,[108] in October 2019 the Council adopted a conclusion calling for action to promote circularity systemically across the value chain. More specifically, the EU Environment ministers have called for an '*EU Textile Strategy to steer the textile sector away from unsustainable production and consumption patterns towards more sustainable and circular value chains, including high-quality industrial recycling*'.[109] The Council also stressed that this cannot be fully achieved without international action, and invites the Commission to come up with an ambitious long-term strategic framework, including a common vision for a circular economy, and to adopt a new circular economy action plan with targeted actions.

At the inter-governmental level, a UN alliance on sustainable fashion was formed in 2019, bringing together different UN bodies with the aim of stopping the fashion industry's environmentally and socially destructive practices and endorsing policies that ensure that the fashion value chain contributes to the achievement of the Sustainable Development Goals.[110]

While the industry is also crowded with voluntary initiatives - such as the Higg Index and the EU Ecolabel (see Box 7) - it has been demonstrated, not least in our report *The false promise of certification*,[111] that voluntary initiatives are limited in the transformation they can drive, and do not always promote the highest level of ambition. Policymakers must therefore move faster to ensure that progress in the textile sector accelerates and translates into actions by *all* actors - not just the frontrunners

BOX 8: The shortcomings of the EU Ecolabel to tackle challenges in viscose manufacturing

In light of viscose fibre manufacturers - including ABG and Lenzing - referring to the EU Ecolabel in their commitments, this box aims to explain its strengths and weaknesses, and the reason why the Changing Markets Foundation decided to select EU BAT as the standard that viscose manufacturers should aim towards.

The EU Ecolabel is an EU-backed voluntary scheme covering a range of products and services, including textiles. The label considers the entire life cycle of a product, from design to use to recycling/disposal, and particularly focuses on the stages where the product accrues the highest environmental impact. The results are third-party verified.[112]

According to the environmental NGO, EEB, the criteria of the Ecolabel help to identify products and services that tend to be among the 10–20% most environmentally friendly in their category – meaning that, in principle, only the products that go the extra mile and do more than just abiding by the law can be certified.[113] Certification is open to any company that sells products within the European Economic Area, whether or not it is based in the EU.[114]

In the case of VSF production, despite the life-cycle approach, the EU Ecolabel only limits sulphur emissions to the air – and, even then, sets less ambitious levels than those defined by the EU Reference Document on BAT in the Production of Polymers.[115] This is confusing; given that the EU Ecolabel covers the top-performing products on the market, it should, in principle, be broadly aligned with the EU BAT levels.[D] More concerningly, the EU Ecolabel does not set limits on emissions to water, which is of serious concern in light of our findings – in our *Dirty fashion* and *Dirty fashion revisited* reports – that water pollution is one of the main environmental risks linked to viscose production. For example, emissions limits for zinc to water were dropped during the revision process in 2013 '*to minimise the number of criteri[a]*'.[116] Hence, the EU Ecolabel also lags behind other European national ecolabels – such as Blue Angel (Germany), Bra Miljöval (Sweden) and Nordic Swan – that cover emissions to water.

		EU BAT	Blue Angel	Nordic Swan	Bra Miljöval	EU Ecolabel
Emissions to air	Sulphur to air (kg/t) expressed as an annual average (VSF)	12-20	20	30	25	30
Water pollution	Zinc to water (g/kg) (VSF)	0.01-0.05	0.16	0.3	0.2	X
	COD (g/t) (VSF)	3,000-5,000	20.000	x	x	X
	Sulphate (kg of SO42-/tonne) (VSF)	200-300	x	x	x	X

Table 3. *EU Ecolabel emissions standards for viscose staple fibre production, in comparison to EU BAT, Blue Angel, Nordic Swan and Bra Miljöval*

Sources: *The Blue Angel,117 Nordic Swan,118 Bra Miljöval119*

Revision of the EU Ecolabel takes place roughly every four years or so, to reflect technological advances and – by raising the bar for eligible products – improve environmental performance.[120] The EU Ecolabel for textiles is slated for revision in 2020. The Changing Markets Foundation urges the European Commission to revise the standard for viscose fibre production so it aligns with EU BAT and, more broadly, with our *Roadmap towards responsible viscose and modal fibre manufacturing* and the progress already being made by the industry.

D The European Commission statement accompanying the last Ecolabel criteria revision made specific reference to opportunities to reflect BAT limit values. See: Dodd, N., Cordella, M., Wolf, O., Waidløw, J., Stibolt, M. and Hansen, E. (2013) Revision of the European Ecolabel and Green Public Procurement (GPP) criteria for textile products. Sevilla: Joint Research Centre, Institute for Prospective Technological Studies.

8. Conclusion

This report has shown that the issue of responsible viscose production is now firmly on the agenda of the fashion industry, and that brands and retailers continue to make progress towards responsible viscose sourcing. At the time of writing, ten global clothing companies with significant market power have signed up to the Changing Markets *Roadmap*; by doing so, they have sent a strong signal to viscose manufacturers that they expect the industry to move to more responsible viscose production by 2023–25. A number of other brands and retailers have also shown proof of meaningful efforts to make their viscose supply chain more responsible, indicating that they, too, could soon be ready to join forces with the frontrunners.

These developments provide grounds for optimism that industry transformation will remain on track in the future. However, the report also highlights a number of areas where companies are falling short, which risks slowing the pace of overall market transformation. A clear message stemming from this finding is that global textile supply chains are currently under-regulated, and that voluntary initiatives need to be supplemented by government action.

The report reflects a notable improvement in engagement on the part of clothing brands and retailers. Of the 91 brands we contacted this year, almost two-thirds (54) provided some kind of response to our questions, compared to roughly one-third of the 53 brands contacted last year.

In addition, this year has seen a strong increase in the number of brands that either already have a viscose fibre-sourcing policy in place or communicated plans to introduce one. However, where they exist, viscose-manufacturing policies are often piecemeal or vague, addressing only a portion of the supply chain through 'sustainable' collections, or offering lofty promises of more responsible viscose without evidence of concrete action. Meanwhile, a large number of brands still fail to even recognise the need to address impacts of viscose fibre manufacture in their supply chains, or to signal that they are making an effort to move towards a more responsible supply. Several brands have shown marked improvement when it comes to transparency; four Changing Markets *Roadmap* signatories now publicly list the companies, down to the factory names, supplying them with viscose.

However, for all these positive steps, the situation at many companies remains extremely unsatisfactory. More than a quarter (27) of the brands we contacted have no viscose-specific policy of any kind. Some of these have little in the way of environmental or supply-chain strategies at all, which demonstrates an astonishing lack of commitment to responsible production and shows they are completely out of step with industry trends and consumer expectations.

Among the lowest-ranked companies, luxury brands Armani, Dior, Dolce & Gabbana, Prada and Versace rub shoulders with low-cost retailers Boohoo, Forever 21, Matalan, Walmart and TK Maxx, proving that this problem is not confined to the cheaper end of the market. Our findings also highlight a clear divide between US and European

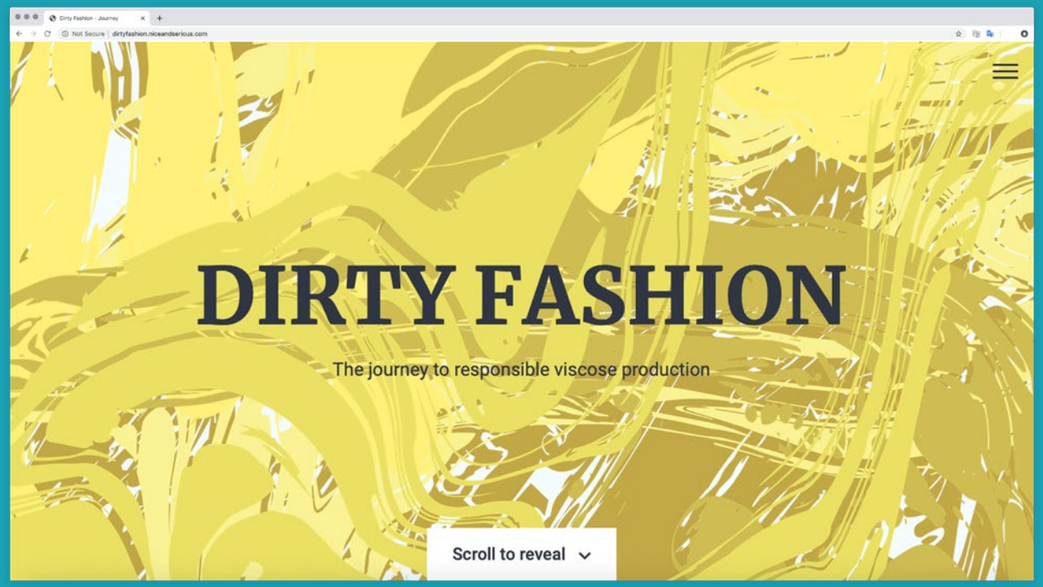
brands. Not one US company made it into the top 'Frontrunner' category, which is dominated by European firms, while only one US brand (Victoria's Secret) made it into the 'Could do better' category.

At manufacturer level, the Chinese industry initiative (CV) to address impacts from viscose production continues to disappoint. This report highlights that, while the CV and its members are dragging their feet on committing to the same standard as other industry players, two Chinese viscose fibre producers have already achieved pollution limits in line with EU BAT: Lenzing's Nanjing plant and ABG's Jingwei Fibres Company Limited (BJFCL).

Elsewhere in the sector, the signs are much more positive. ENKA's recent move to publish its consumption and emissions data on its website is truly groundbreaking. Other global viscose producers should now adopt this approach to allow for independent monitoring and scrutiny of their environmental performance. Lenzing and ABG also stand out for their commitment to meeting EU BAT by 2022. However, it is concerning that sulphur emissions to air are not covered by ABG's pledge, and that it does not appear to have defined a timeline for achieving the EU BAT norms for these emissions. This is something we will continue to monitor. In addition, neither company demonstrates satisfactory efforts on transparency when it comes to reporting information on how complaints and grievances are handled. Both companies should also more clearly communicate how their progress to reach compliance with EU BAT values is monitored and verified, by publicly sharing results of third-party audits.

A recent viscose market report points to the competitive advantage to be gained from focusing on environmental protection,[121] reflecting the fact that there is a clear business case for moving towards responsible production methods. This is recognised by progressive companies, such as ENKA, Lenzing and ABG. The latter two have made some steps beyond closed-loop viscose production by investing in expansion of their lyocell capacities and embracing technologies on circularity. These include Lenzing's Refibra, launched in 2017, which is produced through the lyocell process but made from cotton scraps and responsibly harvested wood; and a new line of viscose, launched by ABG in 2019, which is manufactured using pre-consumer cotton fabric waste that uses a minimum of 20% pre-consumer industrial fabric waste.

However, not all industry players are on the same page, demonstrating the limitations of self-regulation. Given the global nature of the textile industry, tackling environmental and social violations in its supply chains requires an approach that goes beyond national borders and voluntary industry-led initiatives. Policymakers must therefore move faster to regulate textile production and supply chains to ensure progress accelerates and translates into actions by *all* industry players – not just the frontrunners.



To embark on this transition, brands, retailers and producers should consult the Dirty Fashion microsite, which outlines the steps needed to move towards closed-loop production in line with our *Roadmap*.

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