The Traceability Playbook

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The TrusTrace Traceability Playbook is a complete guide to achieving supply chain traceability in the fashion industry, written in collaboration with Fashion Revolution and Fashion for Good. Tapping the expertise of industry thought-leaders, the playbook outlines the fundamentals of traceability, highlights incoming legislation, provides a voice to suppliers, and shines a light on traceability tech innovations reshaping the industry. In the Three Levels of Traceability, discover step-by-step instructions for achieving traceability in your business, no matter where you are in your sustainability journey. The Playbook epitomizes the TrusTrace mission to accelerate sustainable transformation of the fashion industry.

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Sustainable Fashion Journalist

Megan is a sustainable fashion journalist and content editor at TrusTrace. With bylines in publications like the Business of Fashion, Luxury Society, Fashionista, Refinery29, EcoCult and others, Megan covers everything from fashion tech to garment workers' rights, supply chain traceability and consumer psychology, as well as consulting sustainable fashion businesses on how to communicate accurately and authentically. She also has a monthly newsletter, the Titian Thread, which rounds up notable news, content, and tools focused on sustainability and ethics in the fashion industry.

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As an innovation analyst at Fashion for Good's Innovation Platform, James focuses on transparency and traceability initiatives, innovation, and implementation for brands and associated partners. With an academic background in supply chain traceability and sustainability, he completed his masters in International Development at the University of Amsterdam. Subsequently, he worked for Tony's Chocolonely's impact team, at PVH Corp. as a sustainability coordinator, and consulting on ESG and traceability implementation for impact-driven cocoa projects in Ghana, before joining Fashion for Good.

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About TrusTrace

TrusTrace was founded in 2016, with the vision to fundamentally change the way fashion is produced and consumed, after witnessing the detrimental effects of pollution of the local rivers, soil and air coming from unregulated dying factories and textile manufacturers in their local community in Coimbatore, India.

TrusTrace offers a market-leading platform for supply chain transparency and traceability within fashion and retail, to help brands accelerate sustainable transformation and progress towards science-based targets. As a leader in this nascent space, TrusTrace is already fuelling global-scale traceability programs at brands such as adidas, Decathlon, Fjällraven and Filippa K. The platform supports brands with risk management, compliance, product claims, footprint calculations, and the ability to confidently and easily share data about product origin and impact. It is built on AI, blockchain and BOTS, and through its open architecture it is able to integrate seamlessly with retailer-, manufacturer- and supplier systems, as well as those of 3rd parties such as certification agencies, lifecycle datasets and other sustainability solution providers. TrusTrace is headquartered in Stockholm, Sweden, with offices in India, France and the US.

About Fashion Revolution

Fashion Revolution is a global movement campaigning for a fashion industry that conserves and restores the environment and values people over growth and profit. The organisation works in over 90 countries worldwide, with both an innovative and international approach to research, education and advocacy.

Fashion Revolution was founded in 2014 by Carry Somers and Orsola de Castro with the aim to increase transparency in the fashion industry and stand in solidarity with the people who make our clothes. Since then, it has grown to be the world's largest fashion activism movement, mobilising citizens, brands and policymakers to make positive change.

The key pillars of change which Fashion Revolution pushes for include shifting the culture of fashion production and consumption, incentivising fashion brands and retailers to improve their practices and advocating for policy which holds the industry accountable for its impact. Projects include Fashion Revolution Week, a public campaign effort to increase awareness and inspire action, the Fashion Transparency Index, a report analysing the social and environmental public disclosure of 250 of the world's largest fashion brands, and the Good Clothes Fair Pay campaign, a European Citizens' Initiative for living wage due diligence legislation.

Fashion Revolution believes that systemic change is possible and that fashion can be a force for good, which is showcased through the Fashion Open Studio programme, an initiative supporting the world's most innovative designers within a regenerative fashion system.

About Fashion for Good

Fashion for Good is the global platform for innovation. At its core is the Global and Asia Innovation Programme that supports disruptive innovators on their journey to scale, providing hands-on project management, access to funding and expertise, and collaborations with brands and manufacturers to accelerate supply chain implementation.

To activate individuals and industry alike, Fashion for Good houses the world's first interactive museum dedicated to sustainable fashion and innovation to inform and empower people from across the world and creates open-source resources to action change. Fashion for Good's programmes are supported by founding partner Laudes Foundation, co-founder William McDonough and corporate partners adidas, C&A, CHANEL, BESTSELLER, Kering, Levi Strauss & Co., Otto Group, PVH Corp., Stella McCartney, Target and Zalando, and affiliate and regional partners Arvind, Birla Cellulose, Norrøna, Pangaia, Reformation, Teijin Frontier, Vivobarefoot, Welspun and W. L. Gore & Associates.

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CASE STUDIES

Introduction

If you're a fashion industry professional, by now you've undoubtedly heard of traceability. Whether you're well on your way to achieving traceability within your business, or you're just starting the discovery phase, it's never been more important to keep on top of this ever-evolving, business-critical topic.

The fashion industry produces somewhere between 80-150 billion garments every year and in 2015, its carbon emissions accounted for roughly 2% of a global carbon budget created by the International Energy Agency to keep global warming below 2°C degrees. Holding together this trillion-dollar industry is a complicated network of actors forming an intricate web that spans the globe.

While the statistics are alarming, the fact of the matter is that these are only estimations. The lack of accurate data caused by low-quality information means that the industry has no true understanding of its environmental or social impact. With huge data discrepancies, how can we tackle these issues effectively?

Implementing traceability solutions to gain greater transparency over your supply chains can be a daunting task. Achieving traceability is a resource-intensive aspiration for most fashion companies – currently, the majority have not tracked their supply chains beyond tier one. But incoming regulations, as well as increasing pressure from concerned consumers, is set to put traceability at the top of every brand's agenda. At TrusTrace, we've experienced a 350% YoY increase of brand interest in our traceability solutions, proving that traceability is no longer optional, it's a must-have.

Whether you're ready or not, regulations will change the game for fashion's supply chains, reshaping the way business is done for the better. Following a number of high profile supply chain scandals, such as the discovery that Uyghur forced labor was linked to cotton coming out of China, global leaders have begun to put in place punitive measures in the hopes of avoiding future human rights violations.

The fragility and complexity of our global supply chains has never been more apparent than in the last few years, as the COVID-19 pandemic continues to put immense pressure on the flow of goods around the world. For consumer goods like fashion, a product journey can involve raw material producers, processors, assemblers, certifying bodies, logistics providers and retail outlets before reaching the end consumer. With potentially dozens of suppliers per product, it's incredibly easy for information to slip through the cracks or be tampered with.

Traceability isn't just about mapping out your supply chain – it's a crucial part of managing product certifications and relevant product labeling, calculating a product's carbon footprint, and accurately communicating a product's story with your customer too. It's also necessary for the discovery of social and environmental issues as well as the remediation of impacted stakeholders. In short, traceability must be at the heart of any sustainability initiative.

If the industry is a web, TrusTrace is the spider connecting the threads. Since 2016, it's been our mission to shine a light on supply chains by building scalable data-driven tech solutions. We estimate that 95% of supply chain

information is currently being recorded on outdated, inefficient analogue systems, distributed across emails, Excel spreadsheets and paper records. It's no wonder that many fashion businesses have difficulty tracking down the source of the cotton in their shirts or the factory that made their buttons.

At TrusTrace, we believe that brands shouldn't need to be perfect in order to be transparent. Very few businesses have achieved transparency of their supply chains, a task that is infinitely more complicated for larger businesses. Our role is not to judge, but to guide and support our partners through their traceability journey.

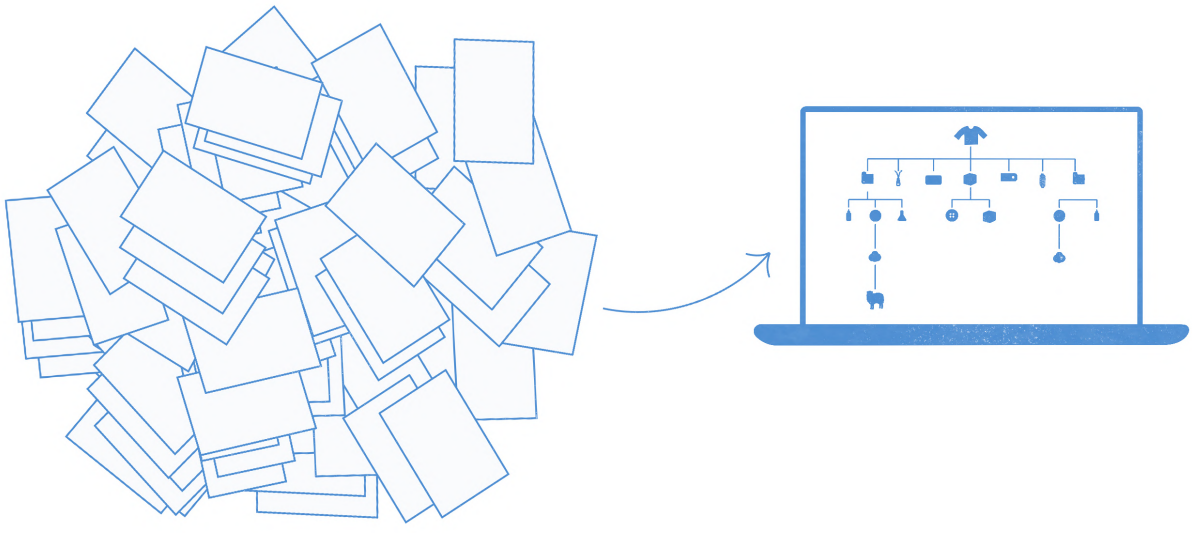
Shameek Ghosh
TrusTrace

As a leader in traceability, it's our responsibility to illuminate the path so that others can start their journey to transparency, for the benefit of the entire fashion industry and all its stakeholders.

Cross-industry collaboration is fundamental to achieving this. We've collaborated with leading authorities from the fashion industry, including advocacy organization Fashion Revolution and innovation accelerator Fashion For Good to create a comprehensive playbook containing the insights you need to gain traceability in your business.

Consider this playbook as a go-to manual for understanding the basics of achieving supply chain traceability, from the key players operating within the vast supply chain network, to the digital trends and innovative materials driving traceability forward. Our ambition is to leave you with a solid understanding of the business case for traceability, plus a step-by-step roadmap to achieve it. No matter where you are in your traceability journey, we aim to help you get further and achieve your goals faster.

Shameek Ghosh, CEO of TrusTrace



Defining Traceability & Transparency

Traceability. In order to understand the ins and outs of traceability, we need to define it. Traceability describes the process of tracing the origins, movement, and evolution of products and materials. It sounds simple enough, but in reality, traceability is incredibly complicated to achieve, especially for large brands with thousands of products and suppliers along the value chain, spread across multiple continents.

The information captured through traceability can be granular – down to the specific components and individual batches of a product. Establishing traceability requires a sophisticated system to record data as a product moves along the supply chain.

> **Traceability is the ability to trace the history,** application or location of an entity **by means of recorded identifications.**
> ISO Standard 9000:2015

Traceability is necessary to prove environmental and social claims about a product so that brands can avoid greenwashing, adhere to certification criteria, and abide by regulations. With increased visibility over their suppliers, brands can more easily monitor for and uncover social and environmental issues.

In the last few years, scandals have plagued the industry – whether that is the production of materials like leather and cotton contributing to the deforestation of the Amazon or wage theft perpetrated against garment workers. Alongside this, recent supply chain crises caused by the pandemic revealed the inflexibility of global supply chains. The business case for traceability has never been stronger.

Transparency. Often thought of as interchangeable words, traceability and transparency go hand in hand, but they have key differences.

In comparison to traceability, which is more focused on internal tracking, transparency is about the communication of information to customers. Compared to the dynamic, real-time data that is linked to materials and products as they move through the supply chain, this information changes less frequently and can be less complex. Transparency helps to hold brands accountable to their commitments through increased public awareness and scrutiny, which is a crucial component of creating a more equitable industry for all stakeholders.

> Transparency relates directly to relevant information [being] **made available** to all elements of the value chain in a standardized way, **which allows common understanding, accessibility, clarity and comparison.**
> European Commission, 2017

Fashion Revolution has been publishing the Fashion Transparency Index (FTI) since 2017, ranking 250 of the world's biggest brands in five key areas, including supply chain traceability. While there's still work to do, the industry has come a long way in this arena, reported the FTI in 2021.

The Business Case for Traceability & Transparency

By Fashion Revolution

Major brands and retailers previously kept their supplier networks hidden, which they viewed as their secret formula for deriving value and therefore something that had to be protected as a competitive advantage.

However, in what was once considered a pipe dream for sustainability advocates, many brands and retailers have now become more transparent by mapping and disclosing their suppliers with the understanding that it won't harm their competitive advantage, but rather can help them to:

More easily track unauthorised subcontracting

Receive timely & credible information from worker representatives which can help mitigate labour & human rights risks

Enhance brand trustworthiness and reputation among consumers and investors

Comply with an increasing number of social and environmental regulationss

Validate data, such as facility name and location, to ensure greater accuracy of supplier information

Enable collaboration with other companies sourcing in the same facilities

Identify bottlenecks and inefficient processes throughout the supply chain in order to improve workflows and save money

Provide competitive advantage resulting in increased market share

Growing interest in transparency can be partly attributed to increasing consumer expectations that brands and retailers are transparent about where, how and under what conditions products are made. In 2020, Fashion Revolution surveyed 5,000 European consumers aged 16-75 and found that 74% believe fashion brands should publish which factories are used to manufacture their products. 73% said fashion brands should publish the suppliers further down the chain where materials are sourced; the latter of which has the least visibility at present and is the source of most labor and environmental issues.

A 2018 study from Futerra and The Consumer Goods Forum found that 94% of consumers are likely to be loyal to a brand that offers complete transparency. However, a 2021 study on sustainability and consumer behavior by Deloitte found that 46% of consumers are looking for more clarity on the origin and sourcing of products, suggesting that brands are still not disclosing enough information about their social and environmental impacts.

Despite this curiosity, the 2021 FTI found that the average score across 250 of the world's largest brands and retailers was just 23% — suggesting that progress on transparent disclosure of social and environmental data is still too slow. The Deloitte survey, which queried 2,000 UK adults aged 18+, found that just 28% of consumers have stopped buying certain products due to ethical and environmental concerns. This figure could be higher, but among respondents, one of the main barriers to making better choices is a lack of access to information. If armed with knowledge, they would be better equipped to scrutinize brands' practices.

Fashion Revolution was inspired to create the FTI with the understanding that transparency is a necessary — albeit not radical — precursor to a fairer, cleaner and more accountable fashion industry.

The Traceability Ecosystem

In 2019, the fashion industry generated over $2 trillion in revenue. Making all this happen is a hierarchy of actors. At one end are the leading fashion brands that dictate the trends and establish business norms, while at the bottom are the people who make our clothes, and the groups fighting to fix the human rights violations and environmental harm that fashion leaves in its wake. We've highlighted a few of the leading actors in each segment.

Brands

From luxury to the high street, the fashion industry is dominated by conglomerates. In fact, just 10 groups, including Richemont, PVH, LVMH, Kering, Boohoo Group, GAP inc, Inditex, Fast Retailing, H&M, and VF Corp, own more than 100 of the biggest fashion brands in the world. Brands hold the most power in the fashion supply chain. Not only do they dictate trends, pricing, and payment terms, but it's common practice for them to change suppliers frequently in search of the most competitive prices, creating a lack of security for suppliers. Brands have the responsibility to implement positive change within their supply chain and to influence the rest of the industry to follow suit.

Suppliers

Suppliers are the cogs that keep the fashion machine running. A supplier is any company that produces or assembles a component of a product, including the fabrics, finishings, threads, packaging, and garment tags. Major fashion brands can have thousands of suppliers working within their supply chain.

While an estimated majority of brands publish their direct suppliers — the factories that sew and finish their garments — the tiers up the supply chain have a higher prevalence of subcontracting and therefore a higher further likelihood of labor and human rights violations, according to a 2013 study conducted by Sedex.

NGOs

In the last decade, a number of non-governmental organizations have been formed to advocate for different causes, from the plight of garment workers to the environment. Among the leading global NGOs are Fashion Revolution, Remake, Clean Clothes Campaign, Textile Exchange, and The OR Foundation. NGOs are critical in raising awareness of key issues in the fashion industry.

Multi-stakeholder Initiatives

Known as MSIs, these initiatives bring together stakeholders from across the fashion ecosystem to create industry-wide dialogue and agree on solutions to common problems. Often, MSIs are financed by fashion brands but are independently governed. Leading MSIs include Better Work, Sustainable Apparel Coalition, Fair Wear Foundation, Ethical Trading Initiative, and the Fair Labor Association.

Certifying Bodies

Increasingly, consumers look for third-party certifications to guide their fashion purchasing decisions. Most certifying bodies specialize in one material category or social cause, doing everything from performing audits, lobbying governments, campaigning, and educating around this issue. Leaders in the certification space include B Lab, Bluesign, Global Organic Textile Standard (GOTS), Leather Working Group, Ecocert, Canopy, Textile Exchange, the Forest Stewardship Council (FSC) and the Better Cotton Initiative (BCI). It's estimated that there are around 30 different voluntary sustainability standards used by the industry.

Audit Bodies

Audit bodies are independent third-party groups that perform on-the-ground assessments of facilities like farms and factories to ensure that they're operating in compliance with certifications. Social Accountability International, Hohenstein Institute, Worldwide Responsible Accredited Production (WRAP), and World Fair Trade Organization are notable auditing bodies.

The efficacy of auditing bodies has come under intense scrutiny in recent years, with the Clean Clothes Campaigns' 2019 Figleaf for Fashion report alleging that they operate in the interest of protecting brand reputation rather than the safety of garment workers and the environment. Most recently, a New York Times investigation exposed the fraudulent certification systems within the organic cotton market. Working with auditing bodies doesn't in itself prevent social and environmental issues from arising. Brands must respond to auditing results by implementing recommendations that work in the interest of impacted stakeholders.

Traceability Tech Companies

TrusTrace isn't alone in the ambition to revolutionize fashion supply chains through technology, and we believe in the power of collaboration, not competition. SupplyShift, TextileGenesis, Sourcemap and Reverse Resources are among the tech platforms that TrusTrace works alongside to supply the industry with data-driven solutions to system-wide supply chain problems.

Traceability Trends

Over the last five years, the fashion industry has faced a heightened level of scrutiny from concerned consumers, charitable organizations, workers' rights groups, governments, and fashion industry professionals.

Fueled by growing awareness of the climate crisis and the ongoing repercussions of the COVID-19 pandemic, fashion's role in creating textile waste through overproduction, being complicit in the use of forced labor, and investing in environmentally damaging farming and manufacturing processes has laid bare the broken system that the industry is built on. The next five years will be a crucial period for the industry to pivot towards genuinely sustainable business practices. We've identified the key trends that have informed fashion in the last decade, as well as the trends that will inform fashion's sustainability strategies in the coming years.

2015 – Now

The 2030 Sustainable Development Goals

In 2015, the United Nations identified 17 Sustainable Development Goals and 169 associated targets that provided a "supremely ambitious and transformational vision" for the next 15 years. These goals have formed the groundwork for sustainability strategies for businesses that are committed to working within the scope of Science-Based Targets, but these businesses are a dedicated few. There is a long way to go before the fashion industry achieves wide-scale, meaningful impact, but the SDGs provide a holistic framework for transformation.

Despite the growing urgency of the climate crisis, a 2022 report from the Intergovernmental Panel on Climate Change (IPCC) revealed that "according to current commitments, global emissions are set to increase almost 14% over the current decade." Current pledges to lower emissions fail to take bold enough steps, creating a widening gap between the commitments and the outcome. To achieve net-zero emissions by 2050, McKinsey estimates that the annual investment needed is $9.2 trillion a year.

EU Taxonomy

Introduced in 2020, the EU Taxonomy is a classification system for sustainable activities, with the goal to "redirect money towards sustainable projects" by fostering investment in areas that align with the Paris Agreement.

The Taxonomy has established six environmental objectives which "should create security for investors, protect private investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation and help shift investments where they are most needed."

Green Bonds and ESG Commitments

The market for green bonds has boomed in the last two years, as investor appetite for Environmental, Social and Governance (ESG) funds continues to grow. Increasingly, investors are interested in financing specific sustainability goals of companies, which could include reducing their carbon footprint by transitioning to renewable energy sources, or investing in certified sustainable materials. The market for green bonds grew by 49% between 2016 and 2021, according to Climate Bonds, and is expected to reach $1 trillion by 2023.

In 2020, Chanel became one of the first luxury fashion groups to issue Sustainability-Linked Bonds worth €600 million to support the brand's Science-Based Targets approved carbon emission reduction goals.

The Covid-19 Pandemic

One of the biggest global events of the last decade, the pandemic disrupted and exposed the flaws of the fashion ecosystem like nothing before. Seemingly overnight, brands with production hubs spread across the world from Turkey to China were unable to transport their products. With stores closed, key revenue streams dried up overnight, causing brands to cancel orders (many that had already been produced) with suppliers.

The fashion industry employs millions of garment workers, many of whom were already experiencing precarious employment and living situations prior to the pandemic. The Clean Clothes Campaign estimates that garment workers lost $11.85 billion in unpaid wages from March 2020 through to March 2021. According to Fashion Revolution's research, 97% of brands did not publish the percentage of workers who lost their jobs due to the pandemic, which paints an incomplete socio-economic picture of the pandemic's impact on workers — amidst a climate where some brands had record-breaking profits.

The pandemic has been a catalyst for the acceleration of online shopping, and the casualization of fashion. According to McKinsey, e-commerce spending was up 30% from the beginning of March to mid-April 2020, and unsurprisingly, British high street stalwart John Lewis reported a 1303% rise in sales of leggings and loungewear in 2020.

Overproduction

One of the most pressing issues facing the industry is the sheer volume of clothing produced every year. Fashion continues to operate in a linear model of producing, using and disposing of apparel. Numbers vary on how much clothing is produced each year,

but Euromonitor estimates that in 2016, U.S. consumers bought 17 billion items of clothing, trailing only behind China, where 40 billion units of clothing were purchased.

In Fashion Revolution's Transparency Index FTI 2021, only 14% of 250 brands disclosed the amount of clothing they produced each year. The lack of transparency over the scale of overconsumption means that estimates could possibly be much higher.

When it's no longer wanted, most of this clothing ends up incinerated or in landfills, (in the UK this amounted to 300,000 tonnes of clothing in household residual waste in 2015) or in the global second-hand fashion market. The vast majority of clothing that is donated in Europe ends up in Africa. At the Kantamanto market in Accra, Ghana, 15 million items of second-hand clothing are delivered each week, and 40% ends up as waste, according to the OR Foundation.

People working in the second-hand clothing trade in Kantamanto purchase bundles of clothing without any visibility into the quality of the garments, meaning they often work at an operational loss if the clothing they buy to resell is unsellable. Transporting these bundles is literally back-breaking work that young women and girls undertake which often leaves them either seriously injured or with long-term health impacts.

Now – 2027

Compliance

For years, environmental and social impact reporting has been done on a voluntary basis, but as the industry becomes increasingly regulated, compliance is now business-critical. “We know that reputation-sensitive brands are following policy developments closely and preparing themselves for compliance,” says Maeve Galvin, global policy & campaigns director at Fashion Revolution.

“Certainly, the recommendations from multi-stakeholder initiatives, policymakers and civil society is for them to start preparing now.” Failure to adhere to laws could result in financial penalties as well as goods stuck at borders. It pays to not only comply but to go above and beyond the current and incoming regulatory requirements to avoid playing catch up as these evolve in the next few years.

Buy Less, Buy Better

Dame Vivienne Westwood famously said: “Buy less, choose well, make it last.” A movement away from cheap, disposable fashion and a constant trend cycle is known as Forever Fashion. In the coming years, experts predict that consumers will invest in higher value, higher quality staple wardrobe pieces that can be repaired and altered to extend their life.

Currently, consumer values and behavior don’t line up. This is known as the attitude-behavior gap — an issue that Zalando, and others, have surveyed consumers about. Zalando found that, while 60% of respondents said that transparency was important to them, only 20% actively search for information about brands while purchasing products. Closing this gap will be a challenge for the industry in the coming years. There is a growing interest in the economic model of Degrowth, which is centred around lowering consumption and production and pivoting away from GDP growth as the primary indicator of a nation’s wellbeing and prosperity. In fashion, all sustainability initiatives should be implemented in conjunction with an overall decrease in production, in order to make a significant reduction in GHG emissions.

Waste Reduction

According to WRAP, 4% of global waste comes from the fashion industry. In the US, textile waste is outpacing the growth of every other type of waste, growing 78% by weight between 2000 and 2017 — that’s an increase of 54% per person. Circularity is a huge challenge for the fashion industry to build into the design of clothing. It requires a total reimagining of the manufacturing process so that clothing can easily be recycled and reused.

Zero-waste design is on the rise, aiming to mitigate waste that occurs in the design and manufacturing process through sampling and pattern cutting. Brands are increasingly using deadstock and end of roll fabrics, repurposing scraps and swatches, swapping to recycled fibers, and designing patterns that can be cut with minimal fabric wastage. In Europe, the New Cotton Project is a collaboration between 12 fashion businesses like H&M, Fashion For Good, adidas, and others, to turn textile waste into a new man-made cellulosic fiber that mimics the look and feel of cotton.

Business Models of the Future

Rent

Companies like Uber and Airbnb have opened doors for the sharing economy. In fashion, this can be seen through the rise of rental, which is expected to reach a market value of $7.45 billion by 2026. The rental boom is led in the U.S. by Rent the Runway, as well as smaller players like Le Tote and StyleLend. In the UK, platforms include HURR, Rotaro, ByRotation, and Hirestreet. By renting a garment instead of buying new, McKinsey estimates through interviews with rental model executives that the lifespan of a product can be extended by 1.8 times. Seeing the growing opportunities in the rental space, fashion brands are keen to get in on the action. American label Vince launched Vince Unfold in 2018, while Banana Republic, a GAP Inc. brand, launched Banana Republic Style Passport in 2019.

Case Study: Nuuly

Nuuly, with its platforms Nuuly Rent and Nuuly Thrift, is a member of the URBN brand family, which also includes Urban Outfitters, Anthropologie, Free People (brands included in the Fashion Transparency Index) as well as BHLDN and Terrain.

Launched in 2019, Nuuly Rent is a subscription-based apparel rental service whereby customers have access to thousands of styles from over 300 brands, though approximately half of inventory is from URBN brands. Customers pay a fixed subscriptions on fee of Us$88 per month to rent 6 pieces, with the option to buy them while they have the pieces at home. Unpurchased items are returned via the pre-printed return shipping label and reusable tote Nuuly provides to customers. All items are returned to the distribution centre where they are laundered and repaired as needed. Nuuly has partnered with small brands to remix damaged rentals and bring them back into the Nuuly Rent assortment as part of the Re_Nuuly collection, reducing clothing waste. Out-of-circulation items from Nuuly Rent are resold through their resale marketplace, Nuuly Thrift, or through the sites of the URBN sister brands.

Kim Gallagher, Director of Marketing & Customer Success at Nuuly, says, “Our research confirmed that our customers were participating in the sharing economy across other industries (i.e. AirBnB, Lyft, Uber,) so we thought, why not fashion? We recognized this as an opportunity to increase people’s access to clothes without ownership.

According to Nuuly, out of all of the garments bought by Nuuly Rent subscribers, ~16,000 were rented 10 or more times before being purchased. Becca Sandercock, Strategy and Insights Manager, says, “One product was rented 25 times before someone decided to finally purchase it,” suggesting that rental garments are being worn repeatedly and that customers are being more thoughtful about committing to their purchases long-term and understanding if a trend is suitable for their needs, rather than making impulsive purchases.

Gallagher says Nuuly’s buying and product care teams are in constant communication, collecting learnings on the impact of wear and laundering, which are passed along to URBN design teams to inform the design and durability of future garments. “We've shifted approximately 70% of our laundering to wet washing in our custom-built, energy- and water-efficient laundry machines, using non-alkaline and phosphate-free cleaning solutions, that are gentler on the environment than household laundry detergents,” the team shared.

Nuuly also repairs garments to extend their life. According to Nuuly’s Head of Product, Sky Pollard: “In 2022 we repaired approximately 75k garments. The most common damage was stains (over 40%). Additionally, we source and replace trims like buttons, buckles and zippers that get damaged or lost during the rental cycle. If we can't get the original trim from a vendor, our very resourceful repairs team scours trim suppliers, and fabric stores for replacements.”

“We don’t believe that sustainability happens in a silo,” Gallagher concludes. “A cross functional task force that includes both our home office and warehouse teams is responsible for moving along sustainability initiatives in their respective areas. We try to approach our sustainability initiatives from a customer-centric point of view.”

For more information on how URBN brands (Urban Outfitters, Anthropologie and Free People) perform on the Fashion Transparency Index, please visit Wikirate.org to review their disclosures.

To view all of the brands’ disclosing information on new business models that support clothing longevity and slow down consumption of new clothing such as renting and reselling, please see this link to Wikirate.

To view all of the brands’ disclosing information on repair services in order to increase clothing longevity and slow down consumption of new clothing, please see this link to Wikirate. To view all other brands’ disclosures related to Overconsumption, Waste and Circularity, please see this link to Wikirate.

Resale

The second-hand clothing market is expected to grow 11 times faster than the broader retail sector by 2025 to reach a value of $77 billion, according to research from ThredUp. While early pioneers of second-hand fashion were companies like eBay, in recent years, market growth has been led by online platforms like Depop, The RealReal, and Vestiaire Collective. ThredUp estimates that buying secondhand clothing reduces the carbon footprint of a garment by up to 82% — over the last 10 years, the amount of carbon displaced by secondhand fashion has reached 116 billion lbs. Much like with fashion rental, brands are looking to capitalize on the success of resale by bringing it in-house. In the U.S, Eileen Fisher has led the charge with a dedicated take-back and resale scheme, called the Renew Initiative, since 2009. The brand says it's collected 1.5 million garments since it launched. Other success stories include Worn Wear by Patagonia and SecondHand by Levi's.

Case Study: Reflaunt

Reflaunt is a software company that allows fashion brands, department stores, and other retailers to participate in the second-hand clothing trade.

Backed by Madalux group, the Bluebell Group — the biggest distributor of luxury brands in Asia — as well as Fashion for Good, The Mills Fabrica, Yellow Octopus and BBCapital Investments, Reflaunt helps brands to transition to a circular fashion system by providing end-to-end support from technology modules to operational management, making the implementation of a resell service as easy as possible.

Reflaunt works with brands and retailers committed to shifting from a traditional linear business model to a circular one. "Sustainability and profitability are not a trade-off; transitioning towards circularity is a requirement," says co-founder Stephanie Crespin of Reflaunt's brand partners, which include Net-a-porter, Mr. Porter, The Outnet, Balenciaga, Harvey Nichols, Ganni, and Axel Arigato, among others.

Reflaunt addresses key issues that are barriers for both brands and consumers to partake in the resale market. This includes reducing the friction of the resale experience, by understanding that consumer engagement with resale can be hindered by the effort required to list an item for sale and the need to hold unwanted stock in their homes.

Reflaunt works with Balenciaga by implementing a plug-in on the brand's e-commerce platform to create a digital wardrobe for each user. This makes it easy to store data on their purchases, which can be used to simplify the process of generating listings. 90% of the information required to resell a product is pre-populated by Reflaunt, so customers can resell with just one click their past purchases in exchange for money back or credits to use at the partner brand.

Whilst the initiative still encourages consumption, for some customers, it is an in-road into slower consumption and engagement with the circular economy. Research by Reflaunt finds that 64% of their female customers have bought or are willing to buy secondhand fashion. Another key issue for brands is that many do not have the infrastructure in place to process single Stock Keeping Units (SKUs) or operate reverse logistics. Brands can outsource this process to Reflaunt, whose Software as a Service (SaaS) technology acts as the bridge between the first and secondhand fashion sales streams. The potential to resell counterfeit items is mitigated by Reflaunt's blockchain-enabled technology, which reduces the risk of this happening by tracking the origin of the item itself.

The Reflaunt team believe that more needs to be done to tackle the end-of-life issue that the fashion industry has created as an outcome of the mass volume of products churned out year on year. "It starts with the implementation of physical/digital IDs to track the journey of all products and map out all the possible end of life routes," says Crespin. "This includes defining the appropriate sales channels for products in excellent condition, upcycling routes for items that fit other types of criteria, and recycling routes if the product has reached its end of life. When items have unique identifiers, it helps to ensure each item is assigned the appropriate path to reach its destination."

Looking to the future, Crespin predicts that "all brands and retailers will have some sort of resale service, but models will vary depending on the brand positioning, price point, and audience," she says. "For example, the resale service we deployed for Balenciaga is different from the service we deployed for Ganni. Brands that are already producing quality products will come out of this stronger, as their customers will want to invest in items that retain value, and this will likely inform their purchase decisions."

Ultimately, Crespin feels that innovative brands and retailers that have invested in services like rental and repair will shift towards a "product-as-a-service" business model, which fundamentally opposes the linear take-make-waste model.

For more information on how Kering brands (Balenciaga, Gucci, Saint Laurent, Bottega Veneta,) perform on the 2021 Fashion Transparency Index, please visit Wikirate.org to review their disclosures.

To view all of the brands' disclosing information on new business models that support clothing longevity and slow down the consumption of new clothing such as renting and reselling, please see this link to Wikirate.

Recycle

Consumer demand for recycled fabrics is rising. Lyst's 2021 Conscious Fashion Report says that demand for upcycled, recycled, repurposed and reworked items on the platform jumped by 117% year on year. But in reality, recycling textiles to create new materials is costly, complicated, and yet to be scaled to the necessary level for mass-market application. Recycled textiles come from three main sources: post-consumer textile waste, pre-consumer textile waste like scraps, and post-industrial waste.

While polyester made from recycled plastic bottles is a popular material for swimwear and activewear brands, it's not without issues. Not only does recycled polyester shed microplastics just like its virgin counterpart, but it also can't yet be recycled easily, breaking the loop on a once recyclable product (the bottle). Currently, recycling is inefficient and is not reducing the pressure on virgin materials.

Brands that offer take-back and recycling schemes tend to work with a logistics partner, such as TerraCycle, Yellow Octopus, or I:CO that will collect, sort, then upcycle, downcycle, or recycle textiles. H&M runs an extensive recycling programme that encourages customers to drop old clothing at their stores. In 2020, the brand says that it collected the equivalent of 94 million t-shirts through the programme.

Case Study: I:CO

I:CO, as part of the SOEX Group, is a supplier of global solutions for the collection, reuse and recycling of used clothing and footwear.

I:CO collects clothing from brands and retailers and then organises the logistics, sorting, and transfer of items. With roughly 7,000 collection points worldwide, I:CO processes 200 tonnes of garments daily in their facility, which is situated in Bitterfield-Wolfen, Germany.

According to I:CO, the biggest challenges facing the textile market are "in the fulfilment of our circularity ambitions because the current lack of design for recycling and the fact that many interesting solutions are still in their infant stage means a lot of research and development is happening on a pilot level but is not yet scalable for a bigger market," says Walter Thomsen, CEO of the SOEX Group. "This makes it harder for brands to find the right partner to provide the exact services for their recycling needs."

I:CO works with several of the world's largest brands and retailers, including H&M to sort garments into three categories:

- Rewear — clothing that can be worn again will be sold second-hand.
- Reuse — clothing and textiles that will be turned into other products, such as cleaning cloths.
- Recycle — clothing that is turned into textile fibers to be used for padding or insulation.

According to H&M, around 50 - 60% of clothes collected are sorted for re-wear and re-use and 35 - 45% are recycled to become products for other industries or made into new fibers by companies such as Renewcell or Infinited Fibre. However, it is important to acknowledge that at present, less than 1% of all textile waste is recycled into new fibres for clothing. H&M collaborates with other partners to make use of the remaining 3-7%.

I:CO has recently announced a partnership with Mango to ensure some textiles and footwear collected in Mango's stores are distributed locally within their country of collection. I:CO is currently collecting with Mango in stores across Turkey, Poland, Germany and Switzerland. "This collaboration will help to expand the Committed Box project, without losing the traceability of the items collected, creating a positive local impact in the different countries where the garments are collected, as well as optimising Mango's reverse logistics," explains Beatriz Bayo Gonzalez, head of sustainability at Mango.

Since 2019, I:CO has piloted automated material recognition machinery. In April 2022, the company announced that it will facilitate sorting for its recycling partners on a larger scale. The machinery determines organic molecular bonds through Near-infrared Spectroscopy and RGB cameras which enable the recognition of the structure and shape of items. Currently, this machinery is able to identify 78 types of materials and mixed fibers, with the ability to successively learn more combinations over the course of its operations. "Our current set-up is able to process 1,600 items per hour, which equals roughly 600 kg per hour, depending on the types of items," says the I:CO team.

Technology such as I:CO's automated material recognition is needed to enable fiber-to-fiber recycling at scale, which will in turn help to combat the amount of global clothing waste and its social and environmental impacts.

For more information on H&M and Mango perform on the 2021 Fashion Transparency Index, please visit Wikirate.org to review their disclosures.

To view all of the brands' disclosing information on new business models that support clothing longevity and slow down the consumption of new clothing such as renting and reselling, please see this link to Wikirate. To view all other brands' disclosures related to Overconsumption, Waste and Circularity, please see this link to Wikirate.

Scaling Traceability

A 2019 McKinsey survey of sourcing executives found that 65% expected to achieve full traceability from fiber to store by 2025. To achieve this, not only do we need to see an ambitious rate of investment, but a complete system redesign that holds brands and retailers accountable for their commitments.

According to the 2021 FTI, 32% of brands have permanent, year-round take-back schemes, but only 22% of brands disclose what happens to clothes received — i.e how much is resold locally, resold into other markets, downcycled, upcycled, recycled into new textiles. Increased transparency on what happens to clothes received through take-back schemes is needed to help reduce the amount of waste sent to landfills. Embracing traceability at scale means investing in the circular economy.

To achieve an economy where little is wasted and clothing stays in use for longer, consumer adoption is crucial. Whether that's buying second-hand and renting clothing, or disposing of clothing through take-back schemes and donation initiatives, there is no circular economy without the participation of the business sector, consumers, and governing bodies.

Case Study: adidas

Global sports brand adidas is one of the first large businesses in the footwear and apparel sector to achieve material traceability at scale, gaining greater visibility into its complete supply chain down to the material level, by using TrusTrace's digital traceability platform.

As part of a commitment to sustainability, adidas has set targets to source 100% recycled polyester, the most common material used in adidas products, by 2024. By 2025, adidas is also aiming for 9 out of 10 of their articles to be sustainable, meaning that they are made with environmentally preferred materials. adidas is leveraging material traceability to track and create a digital chain of custody for the use of certified materials, such as organic cotton or recycled polyester, in every batch of production across its supplier network.

Using material traceability data, adidas has achieved better visibility and control of their supply chain data, and can ensure that compliance needs are met. adidas collects all the supply chain data in real time as the materials flow through the value chain, meaning that the final product has all the data attached to it when it arrives on the market. With this data, adidas checks the finished product vs. the original design/purchase order, ensuring that everything has been produced as planned, and can then easily provide evidence for product or material claims.

With objectives to trace all products and materials across apparel, footwear, and accessories divisions, adidas had to ensure that the traceability solution could cover large amounts of data, meaning a digital, automated, and scalable solution. With many transactions and data points from multiple systems, manual data entry was not an option.

Therefore, adidas integrated their systems with the TrusTrace platform, ensuring seamless data flow between systems such as a PLM, Purchase Order System, and Supplier Management systems. Besides automated data flows, the integrations also ensure data quality, as the data is continually updated, capturing last minute changes to designs or purchase orders. Through a strong focus internally and in collaboration with their suppliers, adidas was able to implement and scale the traceability program within months.

adidas

Case Study: Gucci

Gucci has several circularity initiatives aimed at addressing each stage of the value chain. Beginning in 2016, Gucci was the first luxury brand to use Econyl®, a nylon yarn made from pre- and post-consumer waste such as discarded fishing nets and carpets.

This led to the release of Gucci's Off the Grid collection, which uses Econyl® as the main material. The partnership expanded in 2018 to include a 'GUCCI-ECONYL® Pre Consumer Fabric Take Back Programme whereby Gucci suppliers recover ECONYL® regenerated nylon offcuts from Gucci's production to be re-made into yarn.

To address post-production waste, the Gucci-Up project is focused on the recovery and use of leftover and discarded materials to decrease dependency on new and natural resources. To help in this effort, Gucci works with Green Line, a company specializing in the collection and recycling of textile scraps. Between 2018 and 2021, 445 tonnes of scraps were collected from Gucci's suppliers and re-purposed into new garments. Through this initiative, Gucci engages with NGOs focused on the empowerment of women for the regeneration of the offcuts, as well as with social cooperatives in Italy to support the training and community reintegration of people from marginalised groups.

To address circularity at the raw material level, Gucci is working to improve biodiversity through a Natural Climate Solutions Portfolio, which is focused on protecting forest biodiversity, safeguarding and restoring mangroves from deforestation, and investing in regenerative agriculture within Gucci's supply chain.

The brand incentivises farmers to shift to regenerative practices through carbon farming, which optimises carbon capture on working landscapes by implementing practices that improve the rate at which CO2 is removed from the atmosphere and stored in plants and soil organic matter.

Gucci's latest initiative is Gucci Vault where the "emotional durability" of garments is at the centre. Gucci Vault restores vintage pieces and integrates them with modern elements and also platforms the work of a cohort of designers selected by curator Alessandro Michele, whereby designers must abide by Kering's code of conduct on sustainability, ethics and quality. Gucci's initiatives address different stages of the value chain, from raw material level through to a garment's end-of-life.

GUCCI

For more information on how Kering brands (Gucci, Balenciaga, Saint Laurent, Bottega Veneta,) perform on the 2021 Fashion Transparency Index, please visit Wikirate.org to review their disclosures.

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Standardizing & Decentralizing Data

Experts agree that the transformation of the fashion industry centers around accurate, comparable, and granular-level data. “Credible and robust data needs to form the foundation of any sustainability commitment,” says Amina Razvi, executive director at the Sustainable Apparel Coalition.

“If organizations are promoting green credentials to customers and stakeholders, it is vital the action sitting behind these claims stands up to scrutiny. Without the metrics in place, it’s just marketing spin.”

Initially, data can be used to benchmark and track changes, says Razvi. “Empowering organizations to understand the impact they are making, across their whole supply chain, is central to improving,” she says. “Data is a powerful decision-making tool. It’s the tool that in-house sustainability teams need to build a strong business case for prioritizing purpose as well as profit. It can help leaders make fundamental decisions to create new processes or make changes that are better for people and the planet.”

The proliferation of auditing bodies and certifications attempting to define sustainability and social standards in the fashion industry has created a landscape that lacks a common language. In order to streamline, communicate, and optimize the data collected by different auditing groups, **standardization** is key. Competing standards bodies with incompatible data create a headache for fashion businesses attempting to comply with regulations. “One of the biggest challenges our industry faces is the lack of standardized data to inform insights and collective action,” says Razvi. “If we want to achieve change, we need a coordinated approach.”

For example, cotton can be certified by the GOTS, the Organic Content Standard (OCS), or the BCI. These cover raw material claims like social and environmental impact, but when it comes to siloing these certifications into specific concern areas, the lines are blurred. This makes it even more complex for businesses trying to implement Environmental, Social and Governance (ESG) measures.

The challenge is establishing a common definition of sustainability, understanding how different standards bodies are addressing sustainability from different angles, and how all these players can exchange information so that brands can easily consume data. Common identifiers for suppliers have to be established so that multiple systems auditing different issues within the same facility can exchange and collate information. Open Apparel Registry and GS1 are among the organizations that are establishing this crucial common language so that data can be captured and shared accurately and efficiently.

“Standardized tools enable effective and comparable measurement, helping business and consumers make more informed choices,” says Razvi. “Industry transformation can be achieved through collaboration with leaders, challengers, influencers and experts around the globe. Standardization helps ensure everyone is on the same page with achieving the highest standards of social and environmental performance.”

> It’s important for all organizations to be able to access clear, credible and scientifically rigorous data to support them in measuring the impact of their whole supply chain. **Greater traceability across the industry will drive change, especially when it comes to empowering consumers to make more informed buying choices.**

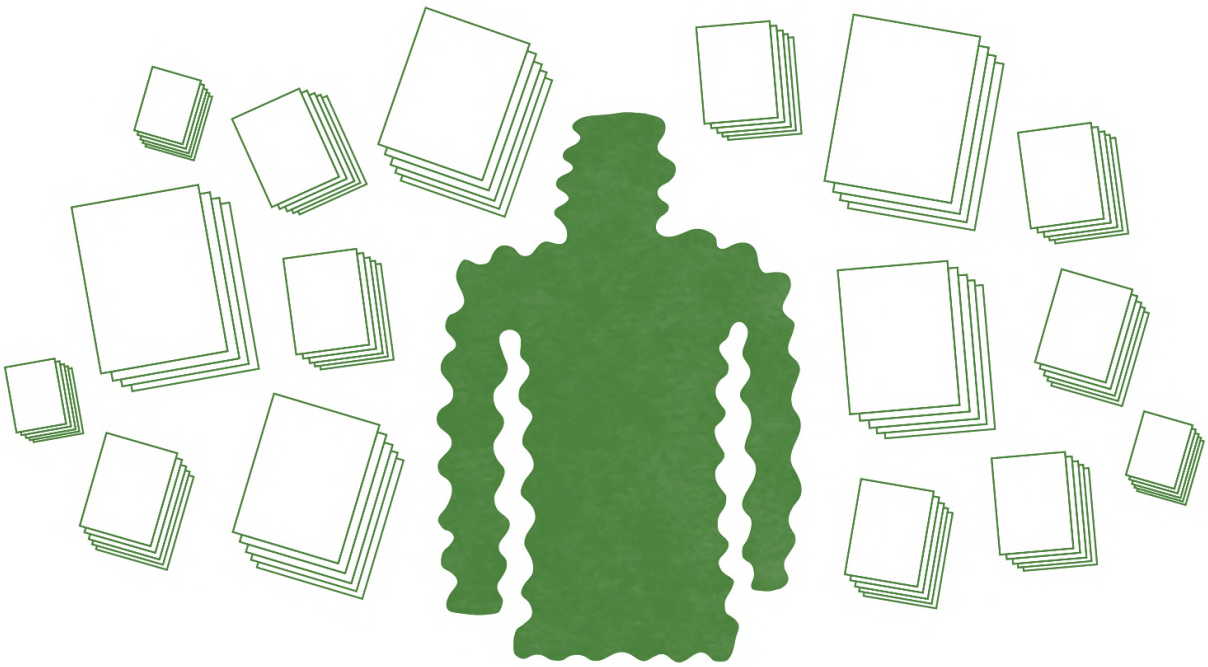
Amina Razvi
Sustainable Apparel Coalition

Decentralization looks at the ownership of data. In a traditional supply chain, this data is centralized. For example, in the production of a t-shirt, the brand producing it would own the data about how it was made, and then the retailer that sold the t-shirt would own the data relating to the batch.

The problem occurs at the end of a product's life when it finds its way to a recycling facility. The brand no longer owns the data relating to that t-shirt, so the recycler may struggle to determine the materials (it's also common for garments to be mislabelled, concealing their true composition), making it challenging to recycle. Therefore, decentralization is crucial to the success of circularity, because it accounts for the fact that a product and its data will live longer than the ownership of the product.

When data is decentralized, it is attached to the product, rather than to the owners of the product. It's not just applicable to the end of life, but to the booming resale market, which increasingly uses data to authenticate goods. Decentralization uses blockchain to ensure that there is no single authority controlling the maintaining the ledger of all the transactions. When data is decentralized, it is democratized. But data doesn't exist in a vacuum — developments in traceability are informed by trends within the fashion industry as well as global economic and cultural shifts.

The value that digital traceability data can bring to a business should not be underestimated. According to Bain & Company's Hernan Saenz, "data allows companies to make predictions, run scenarios, identify unnecessary resource consumption, respond faster to changes in demand, and minimize the impact of internal and external shocks." He says. "These combined benefits will translate into higher growth, lower costs, increased market share, better return on investments, and, overall, an improved return to all stakeholders."



Materials, Innovation & Collaboration

Materials, Innovation & Collaboration

Between 2017 and 2019, there was a 5x increase in the number of “sustainable” fashion products launched onto the market.

Most often, incorporating a percentage of eco-friendly materials is the defining feature of a sustainable product, so it makes sense that when consumers think about a sustainable product, environmental impact is top of mind. For businesses, introducing sustainable materials into their product offering is often at the core of their sustainability strategy. But defining which materials are sustainable and which are not isn’t as straightforward. There is no clear cut separation of ‘good’ and ‘bad’ materials — they all have benefits and drawbacks. It pays to be aware of the environmental and social impact concerns linked to the materials you choose for your business.

Defining Sustainability

By Fashion Revolution

The surge in so-called sustainable materials, fibers and textiles has brought with it a plethora of new terms, certifications and definitions in the fashion industry, leading to challenges in how exactly to define sustainability. The term ‘sustainable’ lacks legal protection and is ambiguous in its definition.

Ultimately, this allows some brands to lead with vague and unverified claims. The 2021 edition of the Fashion Transparency Index (FTI) found that nearly half of major brands and retailers (44%) publish targets on sustainable materials, yet fewer than one-third (30%) define what constitutes a so-called ‘sustainable’ material. Overwhelmingly, brands do not have an agreed, consistent definition of sustainability or how it is enacted in practice. Some use certification schemes, but the majority have been found to be unambitious and untransparent which leads to some brands not addressing critical issues like fossil fuel reliance, microfibers, overproduction and end-of-life issues — all of which are key areas to be considered with regard to sustainability.

The FTI 2021 found that while 44% (110 out of 250 brands) disclose a time-bound and measurable sustainable materials strategy, roadmap or targets, less than 1% of brands disclose the percentage of workers in the supply chain receiving a living wage. This suggests that brands have a tendency to separate workers’ rights and well-being from environmental issues when in reality, they should be considered in tandem. There is no sustainable fashion without fair pay.

Brands must move on from focusing primarily on materials and recast their attention and resources toward the people who make their textiles and garments, too. Ultimately, any claim of sustainability must encompass both social and environmental aspects. Without a concrete

understanding of sustainability, it becomes challenging to trace the social and environmental impact of supply chain materials and practices.

Variances in how we define and conceptualize sustainability means that there is an inconsistency in how data is recorded and shared, if that is done at all, which can delay necessary and meaningful actions to remediate issues. Inconsistent metrics makes it challenging to compare and contrast between brands, while the influx of 'sustainability' accreditation across various materials and textiles leads to confusion, as consumers attempt to make informed decisions about the clothes they choose to buy and how best to care for the clothes they own.

The swell of sustainability claims makes it feel as though sustainability itself is both everywhere and nowhere at once. Considering the variance in how it is interpreted and the lack of legal protection on the term itself, the door is wide open for greenwashing. According to market research undertaken by Changing Markets Foundation, out of 4,000 products from 12 online shops they analyzed, 59% of products that brands called sustainable were deemed to be misleading or unsubstantiated. Often, brands are claiming products as sustainable when in fact just one component part of the end-product is considered sustainable rather than the item in its entirety.

Ultimately, it is imperative that we move beyond the binary of fashion and 'sustainable fashion'. Sustainable fashion should be the norm, not the exception. In order to achieve this, the burden of proof must be placed on companies through compliance and regulation, and not solely through certification schemes. Although we cannot underestimate the power of individual actions on a collective scale, the ultimate responsibility lies with brands and retailers as the power brokers in the industry who should not be producing unsustainable products to begin with.

At COP26 in November 2021, Fashion Revolution signed an open letter organized by Textile Exchange where we urged policymakers to consider working with the apparel, textile, and footwear industry to develop thoughtful trade policy mechanisms to drive the uptake of environmentally preferred materials.

Such mechanisms can be leveraged to drive increased uptake of environmentally preferred materials by mitigating the price premiums that are currently a significant barrier for many companies, potentially making preferred options more favorable than — or at least equal to — their conventional, more impactful counterparts from a cost perspective. With all levers being pulled simultaneously across individuals, brands and policies, we can land on a more standardized vision of sustainability and implement the right processes to ensure it.

Textile Trends

Next-Gen Materials

According to the Material Innovation Initiative (MII), next-gen materials are "livestock-free direct replacements for conventional animal-based leather, silk, down, fur, wool, and exotic skins...[that] use a variety of biomimicry approaches to replicate the aesthetics and performance of their animal-based counterparts." It's a booming market.

The MII surveyed 40 leading fashion brands and found that 38 of them were actively searching for next-gen material alternatives. "There has been an increase in the number of partnerships between brands and next-gen material companies," explains Nicole Rawlings, co-founder and chief executive of MII. "Our Brand Engagement Report, published in February 2022, highlights over 110 partnerships between brands and next-gen material companies. We are also seeing more financial investment by brands in material companies and even a handful developing materials in-house."

Since 2014, 42 next-gen material companies have been founded, totalling 74 around the world in early 2021. Next-gen materials come from a wide variety of sources, from the fungal species mycelium (Mylo™ Unleather by Bolt Threads) to grape skins (Vegea), pineapple leaves (Piñatex® by Ananas Anam), algae (Bloom by Algix) and many more. There are even companies bioengineering animal cells to create lab-grown leathers (Modern Meadow and VitroLabs), furs (FUROID™), as well as turning carbon emissions into carbon-negative textiles (Rubi Laboratories). Leather alternatives are by far the most common category of next-gen materials, says Rawlings. "In April 2021, there were around 49 companies developing next-gen leather, increasing to 67 by the end of 2021, while in April 2021, only nine companies were focused on biomimicry of silk, seven on wool, six on down, five on fur, and one on exotic skins."

While providing a glimpse into the future of materials, many innovative materials are not perfect replacements for their traditional counterparts. For example, many plant-based leathers use petroleum-based resins and chemical binders, making them non-biodegradable. In addition, few have reached a commercial scale of production, which prevents them from taking a larger market share.

"The current challenge in the industry is lack of supply of next-gen materials, not lack of demand," says Rawlings. "In order for the fashion industry to use more sustainable and animal-free materials, those materials need to meet the industry's performance, aesthetic, price, and volume requirements." MII expects that next-gen materials will make up 3% ($2.2 billion) of the materials market by 2026.

> With the continued growth in the next-gen materials, the fashion industry has the opportunity to make significant headway in reducing its environmental footprint. **Brands need to respond to consumers who have indicated clearly that they are ready to support this positive change.**
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> **Nicole Rawlings**
> Material Innovation Initiative

Plastic-free Fashion

Since the mid-1990s, synthetic fibers have dominated the textile market. In 2020, polyester alone made up 52% of the market.

Synthetic fibers, as well as the plastic used for packaging and transporting clothing, are predominantly derived from fossil fuels, which consequently leach chemicals and shed microplastics into the environment.

It's estimated that there are 14 million tons of plastics on the ocean floor, and without divestment by 2050, there will be more plastic in the ocean than fish (by weight). According to the 2021 FTI, although just 25% of brands publish a measurable, time-bound target to reduce the usage of fossil fuel-derived textiles, even less (18%) publish progress on this.

In an effort to shift the fashion industry away from its reliance on fossil-fuel plastic, industry groups have proposed taxing the production of virgin plastics. This was one of the key recommendations to come out of Changing Markets' 2021 report Synthetics Anonymous (which also suggested disincentivizing the use of plastic waste like water bottles as a feedstock for polyester production), as well as the 2019 Fixing Fashion report in the UK. While the recommendations that were laid out by the Fixing Fashion committee were rejected, criticism of the oil and gas industry is increasing, putting pressure on all businesses to find plastic-free textile alternatives.

Regenerative Agriculture and Biodiversity

Loss of biodiversity is inherently linked to the climate crisis.

Toxic chemicals, monoculture farming, water contamination, and deforestation all damage the biodiversity of the natural world and erode soil, which is crucial for absorbing carbon and filtering water. In 2014, the Food and Agriculture Organization of the United Nations predicted that at the current rate of destruction, there could be only 60 years worth of topsoil left on earth. This is a huge concern for the fashion industry, which relies on agriculture for key materials like leather, cotton, wood pulp (for man-made cellulosic fibers) and wool.

Brands must track and audit their supply chains in order to understand where the biodiversity risks are, and how they can source natural materials in a way that gives back to the planet, rather than just extracting from it. Brands are well aware of the urgency: 59% have made public commitments to address biodiversity risk, but only 8% of companies have an explicit biodiversity strategy, according to the 2021 Biodiversity Report by Textile Exchange. Industry initiatives like the Fashion Pact, founded in 2019 with 3 pillars — climate, oceans, and biodiversity — are focused on agricultural investments. By 2025, the group aims to support zero-deforestation and sustainable forest management.

Material Glossary

Global fiber production has almost doubled in the last 20 years — in 2020, 109 million tonnes of fiber were produced.

Textile Exchange expects this number to rise by 34% to 146 million tonnes by 2030. It's crucial that fashion businesses understand the risks hidden in their supply chains, which will be different for every material group that they source from. Below, we've identified the major risks, certifications, and best practices involved with the most popular materials categories. All materials have the potential to pose environmental and social risks, so businesses should investigate these thoroughly and not rely solely on certifications or supplier guarantees when looking into their material supply chains.

MATERIAL	MARKET SHARE*	RISKS	CERTIFICATIONS	BEST-PRACTICE
Synthetic Fibers (polyester & nylon)	**57.6%**	High fossil fuel use & GHG emissions; pollution of marine habitats; use of hazardous chemicals; shedding of microplastics	OEKO-TEX® STANDARD 100	Recycled or bio polyester
Cotton	**23.7%**	Energy-intensive harvesting and ginning; chemical-intensive finishing process; water consumption & contamination; soil degradation; GHG emissions turning yarn into fabric; forced and child labor in supply chains	BSCI, SMETA, STeP by OEKO-TEX®; HIGG, SA 8000; BCI; Cotton Made in Africa; Cleaner Cotton™	Fairtrade cotton; recycled cotton; naturally colored cotton
Leather	**6.6%**	Overgrazing causing soil erosion; animal welfare; high water and chemical use; inadequate personal protection for workers in the supply chain; loss of traceability due to complex supply chain; deforestation of ancient and endangered forests	WRAP; Leather Working Group (LWG); QUIMA; Eurofins, CSBC; OEKO-TEX®	Certified chrome-free or vegetable tanned leather
Man-Made Cellulosics	**6.4%**	Illegal logging & deforestation of ancient and endangered forests; toxic chemical-intensive processing; inadequate personal protection for processors	FSC; PEFC; Canopystyle Audit; SBP; EU Ecolabel; HIGG; RSC	Tencel lyocell, Re:newcell EvrnuFiber™ Refibra™ Orange Fiber And Modal from Lenzing Birla EcoViscose
Organic Cotton	**1%**	Fraudulent organic certifications; GHG emissions turning yarn into fabric	Fairtrade Organic; GOTS; Organic Content Standard; ISO IWA 32:2019; USDA Organic	Certified organic cotton
Wool	**1%**	Land desertification through overgrazing; animal welfare; mulesing; GHG emissions from grazing livestock	Woolmark; Responsible Wool Standard (RWS); Certified Wildlife Friendly; Land to Market; GOTS	RWS certified wool; OCS organic certified wool; Cloudwool®

* Market share size according to findings by the Textile Exchange.

Certification Challenges

In recent years, certifications have grown in popularity as brands have faced increased levels of scrutiny over their sustainability claims. Certifications provide a tick of approval, which can signal to consumers that a brand is committed to investing in sustainability.

"As campaigners and members of the public raise questions about fashion, brands want a short answer. That is most easily done with certification logos," says Paul Foulkes-Arellano, founder and circularity educator at Circuthon Consulting.

"The downside is the sheer number available," says Foulkes-Arellano. "How do you begin to choose the most important ones? Some brands plaster a whole row of certifications on the hangtag — quantity, not quality seems to be the name of the game."

> **It's good that certifications are becoming more and more desirable. But who is certifying the certifiers? Where is the quality control?** Anyone can set up a certification body and start charging money – and frankly, many certifiers don't understand the full ecosystem in which fashion operates. **There is no external scrutiny, no contextualization, as technology permits more rigorous standards to be achievable.**
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> 
>
> **Paul Foulkes-Arellano**
> Circuthon Consulting

A 2022 report by Changing Markets, Licence to Greenwash, has shone a spotlight on ten of the most popular certifications, concluding that they "enable the proliferation of 'greenwashing' on a remarkable scale… Moreover, the level of influence exercised by fashion brands in these initiatives and the lack of any independent oversight, inevitably means that they end up promoting industry interests." What this means for fashion brands that rely on certifications to bolster sustainability claims is not yet clear. The fact is, traceability technology solutions are only as accurate as the data being input. More collaboration is needed between auditing bodies, certifiers, brands, and legislators. The value of accountability and scrutiny has never been more evident.

Recyclable vs Recycled

The circular economy hinges on making clothing with recycled materials, as well as designing for recyclability.

> "Products that are designed with recycled inputs are using materials that have been recovered from either a pre- or post-consumer waste stream and processed into recycled fibers," explains Ina Budde, co-founder and chief executive at Berlin start-up circular.fashion.

"Whereas designing a product for future recyclability enables the product and all its components to be regenerated to a material of high quality able to be used in textiles and clothing again."

The recycling industry faces a number of challenges. While some materials are indeed recyclable, global infrastructure is not sufficiently equipped to deal with the scale of recycling needed to significantly reduce the amount of clothing heading to landfills. "Today, there is a lack of full-scale infrastructure for recycling," says Budde. "Volume and availability of regenerated materials is scaling up, but is still in development."

Of all the textiles produced in 2020, only 8.1% came from recycled materials like PET water bottles or pre/post-consumer textiles. When it comes to the capabilities of recycling infrastructure, "blended materials, attached trims and metal hardware can pose a challenge," explains Budde. Adding to this, "the majority of products today do not have a passport and product ID to ease the data transfer and enable intelligent sorting for recycling. For both chemically and mechanically recycling of fibers, the feedstock is needed in well defined and steady flow. This provides particular challenges to sourcing feedstock of post-consumer textiles as infrastructures are still being optimized." Many brands have committed to replacing virgin synthetics with recycled alternatives, but in 2021, Changing Market's Synthetics Anonymous report found that only a handful of leading brands are actually investing in fiber-to-fiber recycling technology.

Currently, most textiles get downcycled into lower-value products like insulation, mattress fillings, and industrial cloth wipes, not turned into new clothing. Mechanical recycling shortens the length of fibers, meaning that in order to create a usable yarn, it has to be blended with longer, stronger virgin fibers.

While the recycled textiles market is small, it has huge potential for growth. Many solutions are still in their pilot phase; however, companies like Worn Again Technologies, Renewcell, Infinited Fiber Company, and Ambercycle are closing the gap between trial stages and commercial scalability. Legislation is also driving this forward — the 2022 EU Strategy for Sustainable and Circular Textiles envisions that by 2030, all textiles in the EU market will be recyclable and made from recycled fibers.

> To foster a circular economy, **products are ideally made from safe, recycled or renewable inputs**, as well as **designed for longevity and recyclability**.
>
> 
>
> **Ina Budde**
> circular.fashion

Case Study: The Circular Fashion Partnership

The Circular Fashion Partnership (CFP) is a global initiative spurring on local action in textile manufacturing countries to accelerate and scale recycling of post-industrial textile waste. The ambition is to achieve a long-term, scalable, and just transition to a circular fashion industry.

The project facilitates circular commercial collaborations between global fashion brands, manufacturers, and recyclers to enable and incentivize segregation and digital tracing of post-industrial textile waste to recycling solutions. The first CFP was initiated in 2020 in Bangladesh by Global Fashion Agenda, together with the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) and waste traceability platform Reverse Resources with support from Partnership for Green Growth (P4G).

Being able to identify and digitally trace post-industrial textile waste streams, is critical to being able to unlock the opportunities of circular business models within manufacturing countries. “Digital traceability is a critical enabler for the circle economy, and we believe has an important role in achieving a just transition and distributing value fairly across all actors,” says Holly Syrett, director of impact programmes & sustainability at Global Fashion Agenda.

There’s a significant demand from global fashion brands for recycled textiles, yet a very limited supply. Manufacturing countries such as Bangladesh have large quantities of consistent and high quality textile waste streams that form perfect feedstock for textile recyclers. Through the Reverse Resources platform, the CFP was able to track over 100 tonnes of textile waste to suitable recycling solutions. Furthermore, several brand participants were able to go one step further and present the journey of their products made with recycled materials all the way to their end users. “Within the Circular Fashion Partnership, it was through the digital platform of Reverse Resources that we were able to connect waste to recycling solution and present the multi-million dollar opportunity of recycling textile waste domestically,” says Syrett.

By tracing and presenting textile waste streams, the CFP is not just matching feedstock supply of recycled materials with global brand demand, but also presenting opportunities at scale to increase awareness and create a conducive environment for circularity. In Bangladesh, Reverse Resources estimated it could reduce its virgin cotton imports by 15% and save $500 million USD a year, by recycling its 100% cotton offcuts domestically.

CASE STUDY

Circular Fashion Partnership

Material Misconceptions

What do these facts have in common? Fashion is the second most polluting industry in the world. It takes 1,800 gallons of water to create a pair of blue jeans. 20% of global industrial water pollution is from the fashion industry.

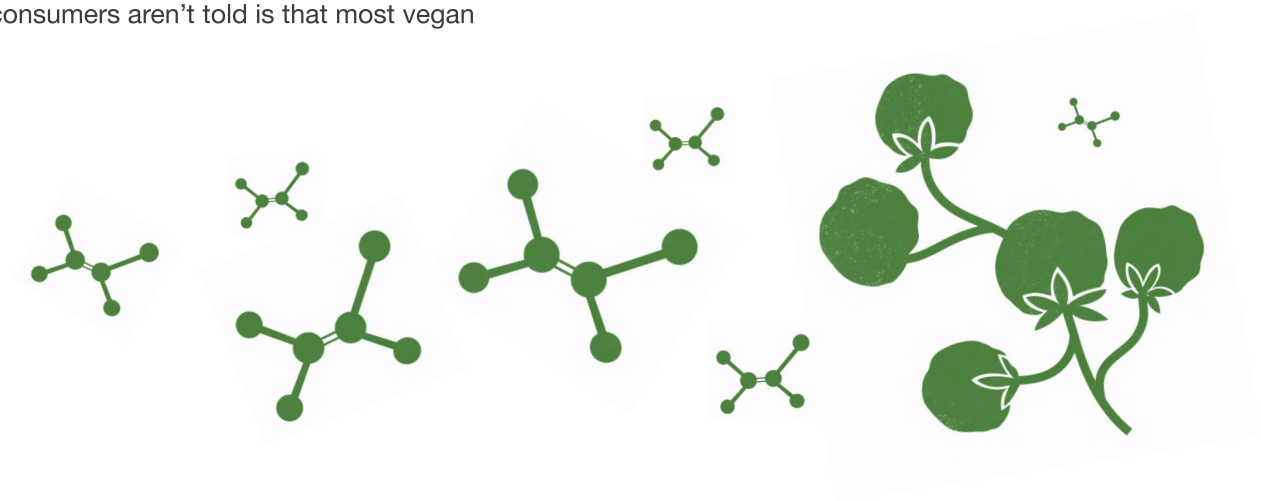
The answer: they're all false. Inaccurate statistics have been swirling around the internet for years, used liberally for their shock value by those trying to communicate the scale of fashion's impact on the environment.

Attempts to verify these statistics have been unsuccessful. Journalist Alden Wicker debunked these facts in 2017 for Racked, then others in 2020 for Vox after seeing false statistics continue to be shared far and wide despite being proved incorrect. "If we're serious about recruiting the fashion industry into the fight to save our world from burning, these bad facts do us all a disservice," she wrote. "They allow brands to wave vaguely at reducing their impact without taking meaningful action. And they stymie the ability to implement meaningful regulation, which needs to be undergirded by solid data."

Proliferating misinformation leads to misconceptions that pose a serious threat to progress, embedding illinformed assumptions into the consumer's mind. In 2021, e-commerce platform Lyst recorded a spike of 178% in searches for vegan leather, as many consumers assume that "vegan" or "animal-free" leather is a more sustainable, ethical alternative. What consumers aren't told is that most vegan leathers on the market are polyurethane (PU) or polyvinyl chloride (PVC), both made from toxic chemicals that are dangerous for the planet and to human health throughout not only the production, but also for use-phase, and end-of-life stage too.

There are many material misconceptions about cotton, and one of the biggest is that it's a water-thirsty crop. In 2021, Transformers Foundation published Cotton: A Case Study in Misinformation with the aim of debunking four common beliefs about the fiber. The report found that while it is true that cotton is often grown in water-stressed regions of the world, the term "thirsty crop" is an oversimplification of the issue. "The relationship between farming, cotton, and sustainable water management is complex," reads the report. "Calling cotton — a plant that's grown in arid regions because it's drought-tolerant — water-thirsty is misleading and can lead consumers to villainize a crop or a fiber rather than open up a conversation about water stewardship and sustainability in the cotton sector."

Considering the prevalence of misconceptions about materials, and no clear answer as to which materials are "good" or "bad", how will the industry know the right way forward? The key is to test different paths while gathering data to understand which solutions provide less impact and enable longer useability. Collaborating as an industry to continuously innovate will be paramount. The good news is there's a lot happening in this space, as you will learn about in the next section on traceability innovation.



Traceability Innovation

By Fashion for Good

From the Fashion for Good innovation perspective, there are two main categories of traceability solutions: Traceability Platforms and Tracer Technologies. Based on the ESG and business relevance of traceability, the demand for supply chain traceability platforms is growing. Traceability platforms are made up of two main sub-categories:

Traceability Platforms: Supply Chain

These are blockchain or cloud-based solutions that provide digital supply chain mapping and visualization tools, and perform material, batch, and product traceability alongside facility profiling. They are used to consolidate and verify chain-of-custody documentation (transaction certificates, scope certificates and associated sustainability standards), and allow Automated Programming Interface (API) integration with brands/suppliers internal systems. The supply chain scope for these solutions are scope three/ cradle to gate/tier four to tier one.

For supply chain traceability platforms, a key distinction is between fiber forward and garment backward approaches. Service providers with fiber forward capabilities allow for real-time and secure digital identities to be created in parallel to the commodity flow. Garment backward solutions follow a more traditional approach, mapping the supply chain from the finished garment backward, usually using a brand's purchase orders as the data pivot to map product origins.

These approaches can be implemented in tandem across different supply chain scopes of focus within a brand's scope three supply chain. For fiber forward approaches, blockchain is utilized for the operational agility it can facilitate: live visibility of product flow, trustworthiness for corporate disclosures, and accurate mathematical calculations between facilities (or "blocks" on the chain) for waste stream analytics, volume reconciliation, smart contracts, and inventory management.

Traceability Platforms: Circularity

These aim to digitize the operations of a product once it has been created, facilitating an effective post-gate circular economy. This allows the communication of supply chain data points to consumers and end-of-use users, via digital product passports which facilitate key use cases for brands: Product authentication, anti-counterfeiting, re-commerce, re-sale, and visibility of material composition for sorting and recycling purposes. The supply chain scope for these solutions are gate to cradle/tier-zero onwards (post-use phase).

Tracer Technologies

Current methods of commodity and information exchange in the fashion supply chain don't always provide adequate levels of verification beyond digital or manual exchanges of chain-of-custody documentation. Within certification schemes, chain-of-custody methods include verification at site and transaction level, but without physical verification of the fibers/ materials themselves.

Widely incentivized by motivations to provide increased traceability confidence to fiber types and certifications, alongside incoming corporate legislation in sourcing regions (e.g. the US Uyghur Forced Labor Prevention Act and the incoming EU directive on Corporate Sustainability Due Diligence), the demand to integrate tracer technologies into global fashion supply chains has risen at a fast pace.

Read about Fashion For Good's Tracing Sustainable Viscose Pilot here

The ability to prove geographic and supply chain origins of sourced materials, and provide physical verification (in tandem with site and transactional documentation) are essential capabilities for supply chain traceability platforms to have. This integrative capacity with tracer technologies can strengthen sustainability claims, showcasing that being 'tracer agnostic' is a central feature of importance for traceability solutions looking forward.

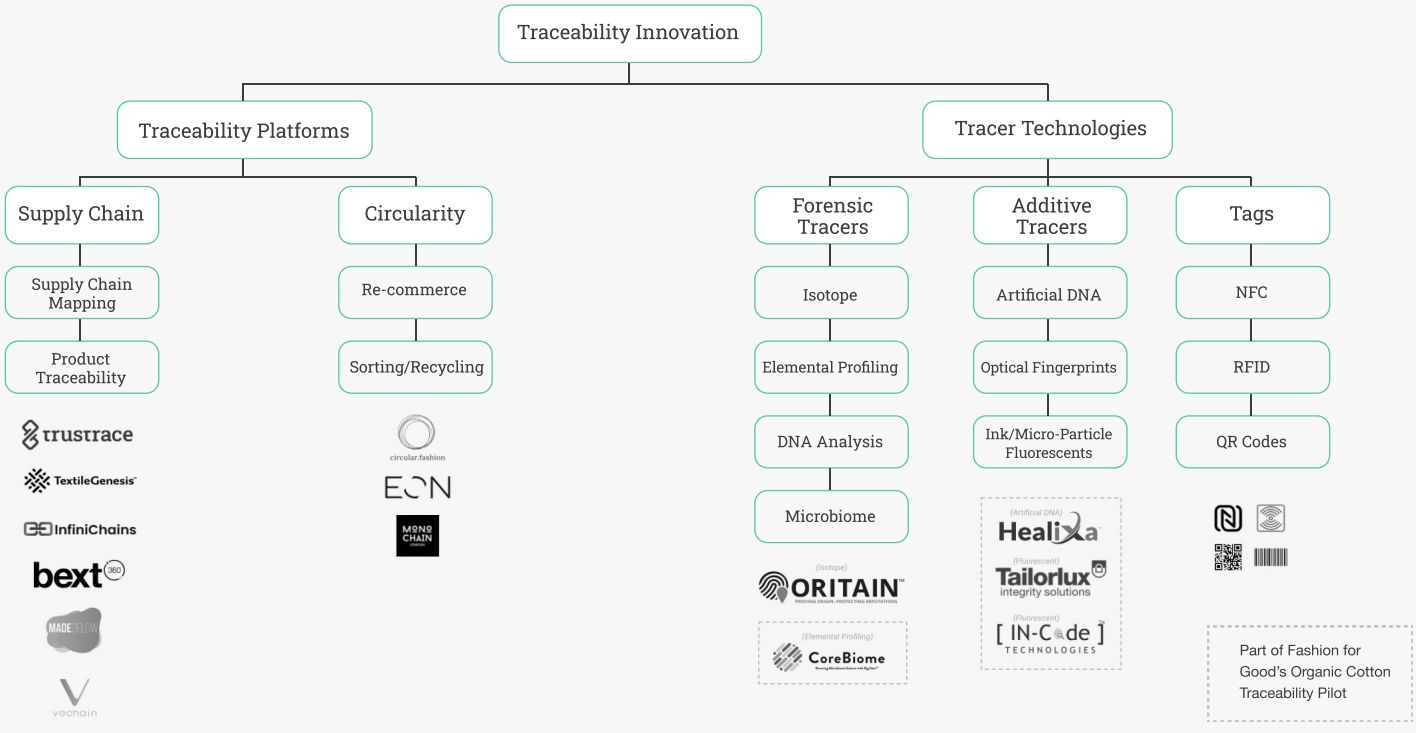
Tracer technologies are made up of three sub-categories:

> **Additive Tracers:** These are physical additives which are applied to the fibers and materials on the supply chain floor, and detected later to prove origin.
>
> **Forensic Tracers:** Technologies that analyze the micro-particle and biochemical composition of fibers and materials in order to prove origin.
>
> **Tags:** Near Field Communication (NFC) and Radio Frequency Identification (RFID) tags are used more for commercial shipping and logistics. These are not focused on the upper stream supply chain but rather used on finished goods and downstream on shipping pallets and boxes.

Both the Additive Tracer and Forensic Tracer sub-categories are used to trace and authenticate fibers and materials, proving supply chain and geographic origins. Forensic Tracers have off-site detection and no need for application of any substance or marking onto fibers, yarns, or materials. For the user, their implementation has less supply chain operational workload and burden. They are useful to facilitate ad-hoc "spot checking", indicating with confidence that the fibers sourced meet desired sustainability criteria, and helping to red-flag questionable geographic sourcing areas (e.g. forced labor concerns). In addition, they are used to communicate the authenticity of premium and preferred sustainable fibers (e.g. organic supima cotton).

With a smaller range of Tracer Technologies available in the Forensic Tracer category (compared with Additive Tracers), their usability focuses on transparency of first-mile origins of natural fibers, rather than physically and digitally tracking product flows in real-time throughout all tiers of the supply chain. Additive Tracers bear more supply chain operational work for implementation and maintenance, as they have on-site application and detection processes.

Supplier engagement and management is a key prerequisite to enable the sound operational performance and logistical maintenance for Additive Tracers on the facility floor. They hold more flexibility for the user to provide traceability integrity based on wider supply chain operability and coverage for a larger scope of supply chain tiers and fiber types. As the title suggests, Additive Tracers are applied onto fibers and



materials, existing physically within the fiber or material traced. This physical traceability runs in parallel to digital traceability. Many of the Additive Tracer companies have their own proprietary IT system to facilitate data uploads and analysis from detection processes that 'checkpoint' the fiber or material through supply chain tiers, since the point of application. With a wider range tracer technologies available in the Additive Tracer category, their usability is more flexible, based on wider claimed supply chain operability and coverage. They hold a focus on physical tracing of fibers and materials, and the associated digital capabilities for data uploads, real-time tracking, and analysis. This allows for an innovative synchronization of the physical and digital traceability worlds.

Overall Tracer Technologies have the capability to provide physical verification for fibers and materials in parallel with chain-of-custody traceability. This allows for:

- Manufacturers, brands, and retailers to more confidently verify chain-of-custody claims, and consumer-facing sustainable product communication.
- Reduction of auditing and supply chain risk assessment through authorized relationships between tracer technologies, suppliers, brands, and certification bodies.
- The incentivization of suppliers and manufacturers to meet the criteria of sustainability standards and certification more rigorously, by identifying and flagging certificate counterfeiting.

Conclusive Thoughts

In the traceability innovation landscape, we have seen an increase in the number of innovators emerging in the Supply Chain Traceability Platform Space. This is due to the widespread motivations to digitize supply chain data across industries for supply chain management purposes: ESG improvements, supply chain risk assessment, inventory and capacity planning, and financial forecasting. On the contrary, there has been a smaller number of Tracer Technologies that have matured. This is mainly due to the delayed business case for physical/material level traceability verification, and the greater difficulty implementing such technologies compared to improving digital traceability and inventory control.

From Fashion for Good's perspective, in order for brands to achieve traceability excellence, three levels of verification need to be realized and maintained.

First Step: Digital Traceability

In collaboration with the selected supply chain traceability platform:

- Perform **transactional-level verification** via product traceability, tracking product journeys either by fiber forward or garment backward approaches.
- Perform **site-level verification** by creating visibility and engagement with your supply chain landscape and facilities.

Second Step: Physical Traceability

- In collaboration with selected tracer technology, (if required) perform **physical/material-level verification** of sustainable and preferred fibers.

The harmonization of digital traceability with physical traceability rests on the agnostic and integrative capabilities between Supply Chain Traceability Platforms and Tracer Technologies.

Read about Fashion For Good's Organic Cotton Traceability Pilot here

Supplier Investment & Collaboration

Sustainable Financing

In order to see significant shifts in the industry, Fashion for Good estimates that $20 – $30 billion in financing needs to be invested each year until 2030.

Raw materials and the end-of-use phases make up around 45% of current financing demand, according to Financing the Transformation in the Fashion Industry, published by Fashion for Good and Boston Consulting Group in 2020. 35% of financing demand is needed to support innovation in processing and cut-make-trim, such as waterless dyes and zero-waste manufacturing infrastructure, while the last 20% is split between retail, usage, and other innovations, reads the report. Specialized funds like Textile Innovation Fund and Good Fashion Fund are working to accelerate investment in sustainable fashion innovation. "Brands and manufacturers have historically not been active in providing financing for the kinds of sustainable disruptive innovation similar to those that we support at Fashion for Good," says Rogier van Mazijk, investment director at Fashion for Good. "Financing of sustainability is, however, not limited to the financing of disruptive innovation, but also includes other initiatives and the further adoption of already existing solutions."

> **For many investors, the sustainability element in itself is not a major driver**, but many traceability/transparency innovators are able to combine positive impact with attractive business models, and therefore financial returns, for investors.
>
> 
>
> **Rogier van Mazijk**
> Fashion for Good

Technologies to Improve Production

The Financing the Transformation report identified two categories of technological innovation that are the key drivers of transformation: "soft" and "hard" technology.

Soft technology refers to digital B2C solutions like rental and resale platforms, as well as B2B solutions like traceability software. Hard tech, on the other hand, is "asset-intensive, physical, science-based technology," which includes innovations that integrate into existing production systems — such as bio-based dyes and toxic-chemical free solvents — and innovations that require the development of new infrastructure, like chemical recycling, biodegradable yarns, and lab-grown materials.

Hard tech solutions often occur deeper in a brand's supply chain in facilities that they don't own. Therefore, facilities are expected to improve infrastructure to be more sustainable, but aren't provided with the financial support to do so. "Hard tech has a number of fundamental properties that may make it unattractive to investors," says van Mazijk. "But part of the problem is also that investors have traditionally focused on software and therefore there are fewer investors familiar with, and active in, the hard-tech space."

The Supplier Perspective

What are suppliers asking for?

It is critically important that investment in sustainability is used to improve the working conditions and infrastructure in facilities throughout the entire supply chain.

Too often, investment initiatives focus on retail spaces and brand-owned facilities, failing to reach the facilities deeper in the supply chain. There is a difference of opinion in the industry as to whose responsibility it is to fund sustainable transformation in facilities that aren't owned by brands. Generally, fashion companies believe that facilities should finance their own improvements; however, the tight margins imposed by these brands don't give facilities enough financial capacity to do so. The inability to find common ground on this core issue creates a stalemate and stalls progress, which can only be resolved through open discussion and collaboration about the challenges in the brand-supplier relationships.

A GOTS certified tier 1 supplier in Southern India told TrusTrace:

"Usually, textile manufacturers reside in developing countries. **Sustainability is still not a burning issue in countries like ours, where the majority of the population is looking to just make ends meet.** When we start our businesses, our top priority is to provide a good life for our families and ensure our employees are able to meet their needs. In a situation like this, even if sustainability in terms of practice and sourcing can be appreciated, it can most certainly not be afforded. Initially, these practices are driven by brand requirements rather than personal preferences. But after suppliers reach a point of establishment, they can appreciate and practice these on their own, even without push from brands.

Despite sustainability being preached in today's world, it is still suppliers that bear the costs of sustainable textile production. Suppliers are expected to follow sustainable practices, source from sustainable suppliers, be certified under different material and social certifications and yet, final product costs are still kept low.

The least that brands can do to help suppliers switch to more sustainable practices is to pay the real cost of the goods.

In order to have any room to invest in improvements, supplier compensation must take into account the inflation in raw materials, petrol, shipping and increasing wages, as well as the cost of capital tied up from what the supplier pays for raw materials ahead of production. Often, suppliers receive payment 60 days after their customer has received the shipment. If customers are willing to pay more for sustainable products, brands can easily afford to pay more to the suppliers as well.

Consumers ought to know that some of their favorite 'sustainable' brands have even canceled orders after suppliers have invested money, time and effort into executing them during Covid. Though this was not the case with our brands, we do know of fellow suppliers who have lost a fortune like this. Also, suppliers get paid two months after delivering goods and if there are any delays, the brunt is always borne by suppliers. **Consumers should be as eager to understand brand sourcing practices as they are to understand supplier sustainability practices. This will help brands stay accountable for sourcing practices and make sustainability more of a two-way street!"**

The supplier prefers to stay anonymous to avoid potentially damaging relationships with their brand customers.

Case Study: Shimmy

Shimmy Technologies is an AI-powered app-based training platform designed to upskill and reskill garment manufacturing workers anywhere. It supports efficiency, spikes in demand, and "Industry 4.0" — what Shimmy calls the empowered collaboration between human and machine.

Shimmy founder Sarah Krasley believes that to acknowledge the transformative potential of the circular economy, it is necessary to design positive social outcomes to support workers. Thus, Shimmy was born.

Automation is an inevitable reality. In 2018, McKinsey surveyed US apparel executives and international procurement officers who projected that simple garment production will be fully automated by 2025, resulting in an 80% reduction in the labor force. This leaves little time to transition tens of millions of workers (a majority of whom are women) to new ways of making a living.

Upskilling can be thought of as a layer that runs alongside the automation process. As workers are displaced or reskilled into other jobs, it is brands' and manufacturers' responsibility to support workers as the number of human product jobs become fewer and fewer.

Krasley and her team are constantly tracking machine competencies and skills in the market to guarantee their training is calibrated with market needs. Shimmy first collaborated with the International Labour Organization's (ILO) Better Work Programme in 2020 to research the rate of automation in the garment sector and the workforce impacts that will result in the country, especially on women.

The findings suggested that enhanced automation won't completely change the factory set-up as traditional methods and the human touch are still required, making the automation of the garment industry slower than in others. The process is gradual but early investment is key. Shimmy, alongside CARE Bangladesh and The Asia Foundation, recently completed a technical skills training for female workers called the Gender Norms Pilot in The Future of Work project. It was funded by the H&M Foundation, with the aim to address the skills and wages gap between male and female workers and to support womens' promotion beyond entry-level positions. Shimmy is also working with other major brands and retailers such as Zalando and Under Armour.

"Upskilling leads to workers' resilience and flexibility. Whilst some manufacturers are hesitant to upskill workers for fear they may go to a different factory, more strategic ones view upskilling as an investment that will ultimately reduce operational costs," says Krasley. Investment in upskilling allows workers to understand critical processes and machines, enabling greater efficiency.

Krasley says this type of flexibility is important for a number of reasons. "If a worker needs to migrate home, they can. If facilities must close because of infection, workers have the option to take up work elsewhere as they are empowered with diversified skills that can be deployed on many different machines. With the impact of the climate crisis, one must consider the increased probability of damaging waves of infections. Upskilling removes these bottlenecks."

Ultimately, the reality of the transition to a circular economy is that it will occur alongside intensified precarity and economic inequality throughout the global fashion system, agitated by the impacts of the climate crisis. Krasley believes more support could be implemented in the form of taxes and/or rebates. For example, alongside the purchase of automated equipment, a re-skilling rebate could be included and funded in part by local governments. Supply chain actors cannot automate parts of the production process and leave workers to figure it out — upskilling and re-skilling must run in tandem with any updates made.

For more recommendations on what actions can be taken to center workers in the transition to a circular fashion system, check out this BSR report.

The Business Drivers of Traceability

Laws and Regulations

Legislation is coming for the fashion industry. In 2022 alone, several new regulations and directives have been introduced, predominantly in the EU, to define parameters around marketing and labeling, due diligence and traceability, as well as sustainability reporting.

Brands are facing increasing pressure to comply with a range of overlapping laws that differ from country to country, and even state to state in key markets like the U.S.

But what do they have in common? “All of the regulations have embedded a requirement to strengthen traceability,” says Baptiste Carriere-Pradal, chair of Policy Hub, a group that represents the voices of the apparel and footwear industry to propose policies that accelerate circular and sustainable practices.

“They ask you to know your risk all across your value chain. Normally when a brand thinks about traceability, they think about traceability upstream. They don't think of traceability downstream," says Carriere-Pradal. "What we see is that traceability requirements will also be downstream, meaning that if you put a product on the market that ends up on the landfill in South America or Africa, it could also be your responsibility.”

In the past, the industry’s preference for voluntary commitments has failed to make a meaningful impact, so while it may appear that many new pieces of regulation are emerging all at once, the industry is actually playing catch-up to other highly-regulated sectors like the automotive industry. “Some individual brands were moving forward fast, but as a whole, we didn't move as we should have moved, and everybody recognizes that,” says Carriere-Pradal. “That being said, there is a need for regulation, because regulation tends to set clear targets, which will be key to move forward. This will require a lot of time and some predictability to be deployed at scale."

While key factors like the legal interpretation and practical implementation of these laws are yet to be fully understood, Carriere-Pradal believes that businesses should begin to invest in and prepare for compliance. “Many brands still have the same system of sustainability or the same staff budgets that they had years ago, in an industry where the requirements of the sustainability department have changed dramatically,” he says. “But the budgets haven't followed, the capacities of the team haven't followed, and they keep having to prioritize between knowing the environmental footprint of a product or tackling forced labor in the cotton field.”

Carriere-Pradal says that while many regulations come into effect in 2026, brands must use this time wisely to prepare their business. “When you are a sizable organization, 2026 may as well be tomorrow. It requires a clear plan about increasing your capacity, your infrastructures and your team. It's paramount for organizations to have a clear and ambitious target with a clear expansion of their capacity to be able to tackle those emerging demands by 2026.”

> Traceability is only here to serve a purpose: **to enable a better understanding of the environmental and social risk and performance** across your downstream and upstream operations. This requires capacity that you need to plan and budget for today. It’s not just an intern that you hire for the summer, **it’s a robust team with the means to achieve their goals.**

Baptiste Carriere-Pradal
Policy Hub

Key Laws and Regulations

It can seem like a daunting task to keep track of, let alone comply with all the global laws and regulations out there.

Detailing all of them would fill a book, so we're looking into some of the laws that are affecting sustainability within fashion right now: the European Green Deal and the Sustainable Textile Strategy, the Uyghur Forced Labor Prevention Act, The New York State Fashion Act, and the FABRIC Act. We will also share a broader overview of the types of laws and regulations affecting the fashion industry and when they are expected to come into force.

The European Green Deal

The European Green Deal, published in 2019, states that, "Companies making 'green claims' should substantiate these against a standard methodology to assess their impact on the environment."

Via the Circular Economy Action Plan (CEAP) in 2020, the European Commission announced a legislative proposal to require environmental claims to be substantiated using the Product & Organisation Environmental Footprint (PEF & OEF) methods. In March 2022, the textile industry was called out as a key focus area, addressed by the EU Strategy for Sustainable and Circular Textiles, which is why the European Green Deal is now pivotal to consider and plan for going forward. The Sustainable Textile Strategy covers both Extended Producer Responsibility for products beyond the point of purchase, all the way to end of life, as well as the empowerment of consumers to make better choices. This includes:

- Introducing mandatory ecodesign requirements
- Stopping the destruction of unsold or returned textiles
- Addressing microplastics waste
- Introduction of a digital product passport to provide clear information on environmental characteristics of a product
- Ensure that consumers are provided with information at the point of sale about a commercial guarantee of durability as well as information relevant to repair, including a repairability score, whenever this is available.
- Extended Producer Responsibility and boosting reuse and recycling of textile waste

In 2020, the European Commission issued a new legislative proposal: the Substantiate Green Claims Initiative.

It may require companies to substantiate any impact-related claim with a standard methodology (PEF will very likely be selected). The objective of this initiative is to move to a more harmonized approach for providing reliable environmental information. All options will cover claims made for any of the 16 environmental impacts covered. Options will be considered in synergy with the other initiatives announced in the CEAP.

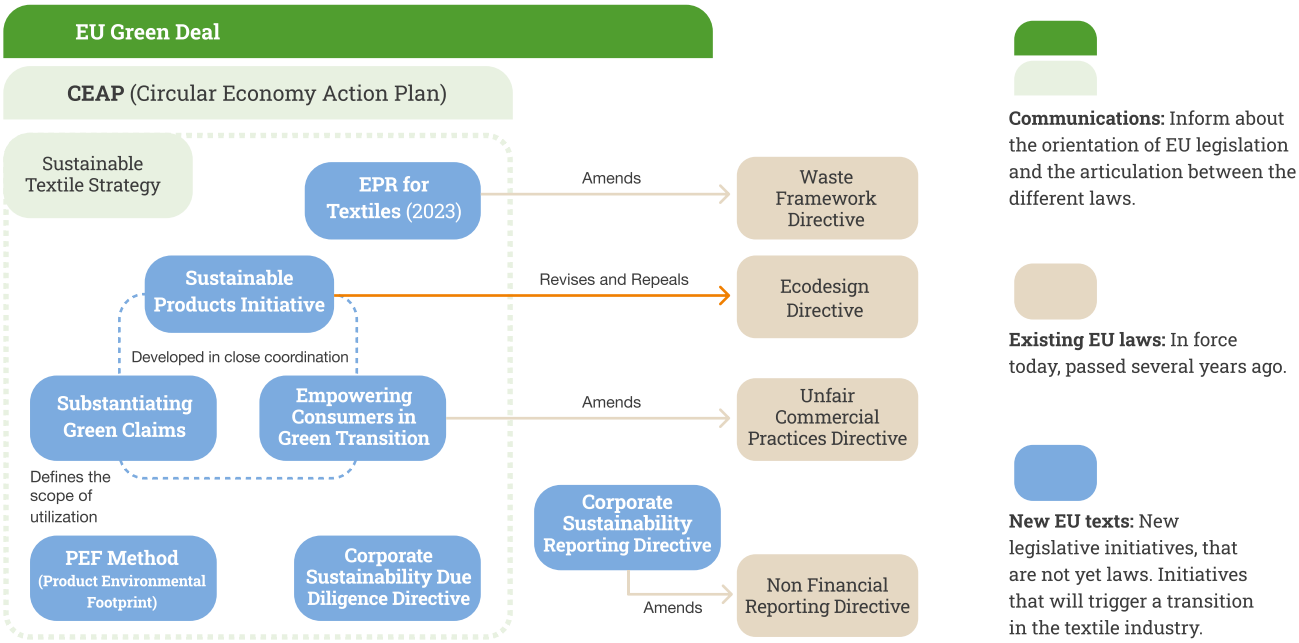
The Anti-Waste for a Circular Economy Law

In May 2022, France introduced a new decree as part of the Anti-Waste for a Circular Economy (AGEC) law, which focuses on consumer information about the environmental qualities and characteristics of waste-generating products. The aim is to inform the consumer on the conditions relating to better prevention and gestation of waste.

The decree mandates distributors, importers, and producers to disclose more detailed information about their products. Specifically, they will have to disclose information on traceability and the country where each of their processes such as weaving, dying, and tailoring is performed. They will also need to provide granular data on the recyclability, the recycled material content, and the presence of harmful substances in their products.

The time frame is quite ambitious and will be applicable from January 2023.

Diagram on EU Legislations



The Uyghur Forced Labor Prevention Act

The Uyghur Forced Labor Prevention Act. In late 2019, numerous investigations into the detention of Uyghur Muslims in the Xinjiang Uyghur Autonomous Region (XUAR) of China revealed that fashion's supply chains were complicit in the forced labor of at least 80,000 Uyghur people between 2017-2019.

As 84% of China's cotton exports come from this region — making up 1 in 5 cotton garments on the global market — many of fashion's biggest brands were found to have acquired cotton linked to forced Uyghur labor.

In response, the US Customs and Border Protection (CBP) issued a withhold release order (WRO) in 2021 against cotton and cotton products produced in whole or in part in the XUAR. Expanding on the scope of the WRO, the Uyghur Forced Labor Prevention Act will come into effect in June 2022. It decrees that all products coming from the XUAR, not just cotton, will be prevented from entering the U.S. until importers can prove that forced labor has not been exploited in the supply chain. In order to prove this, importers must:

- **Provide a certificate of origin, signed by the seller/manufacturer/owner of the article (19 C.F.R §12.43 (a);)** a standard certificate of origin is not acceptable.
- **Accompany the import with a detailed statement** which discloses the ultimate consignee of the merchandise and the merchandise's entire supply chain, from bale to final product, including names, production process and addresses of each supplier.

Failure to comply will result in fines of up to $250,000, or twice the amount of the transaction being held by the CBP. Click here for more information on The Uyghur Forced Labor Prevention Act.

New York State Fashion Sustainability and Social Accountability Act

Introduced in January 2022, this bill is commonly referred to as the Fashion Sustainability Act. This proposal holds fashion brands with over $100 million in revenue that sell within the state of New York accountable for their environmental and social impact. New York is the epicenter of American fashion, so this bill could impact the biggest brands in the world and set a precedent that other fashion capitals may follow.

If it becomes law, affected brands will be required to map at least 50% of their suppliers by volume across all tiers of their supply chain in order to identify the high-risk players. Businesses will then set and disclose annual carbon emission reduction targets, material production volumes, breakdown by material type, as well as the percentage of their raw materials replaced by recycled material. Because transparency is at the core of this bill, businesses must produce and publish an annual report on their progress. Failure to comply may result in fines of up to 2% of annual revenues, which will go into a Community Benefit Fund for environmental projects. As of May 2022, the bill has stalled and its future is uncertain.

Click here for more information on the Fashion Sustainability Act.

The FABRIC Act

In an effort to strengthen the Fashion Sustainability Act, Remake, alongside Fashion Revolution and 18 other organizations, sent a letter to the Fashion Sustainability and Social Accountability Act to elected officials following its publication. The bill proposes more concrete actions to ensure environmental and social issues are identified and prevented, including a liability clause that holds brands accountable for wage theft in their supply chain, in line with the California Garment Worker Protection Act (SB62).

Alongside this, the proposal of the Fashioning Accountability and Building Real Institutional Change (FABRIC Act) is calling for the following federal level regulations in the U.S.:

- The establishment of a $40 million Domestic Garment Manufacturing Support Program to supply grants to manufacturers for equipment costs, safety improvements, training and workforce development.
- A 30% reshoring tax credit for garment manufacturers who move manufacturing operations to the U.S. This credit will be applicable to costs associated with reshoring production.
- The establishment of a nationwide garment industry registry through the Department of Labor to promote transparency, hold bad actors accountable, and level the playing field.
- New requirements which hold fashion brands and retailers alongside manufacturing partners jointly accountable for workplace wage violations to incentivize fair workplaces, starting at the top.
- Setting hourly pay in the garment industry and eliminating piece rate pay until the minimum wage is met to ensure jobs with dignity. Productivity incentives on top remain protected.

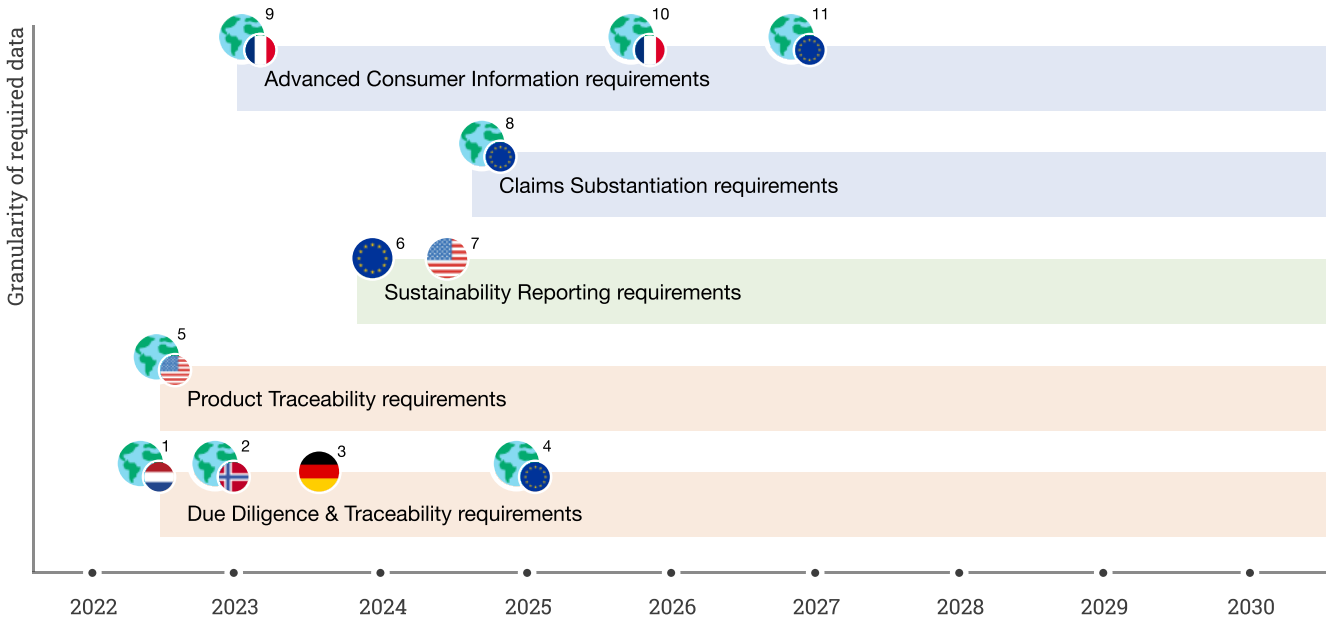
Click here for more information on the FABRIC Act.

The Laws and Regulations Timeline

Below, we have outlined some of the laws and regulations affecting the fashion industry and when they are expected to come into force. Some of them are a couple of years away, meaning that the exact time of enforcement is likely to change, but what will not change is that laws and regulation are here to stay. To get a better sense of the different laws & regulations, you can look at them as belonging to one of the five groups:

Due Diligence & Traceability	Laws that require companies to identify and mitigate environmental and/or social risks along their supply chain. To do so, companies need to start by mapping their suppliers.
Product Traceability	Laws that require brands to collect certain information about the supply chain at a product level. It can be country of origin, environmental negative impacts or social negative impacts. This requires to build a product tree identifying all suppliers involved in the making of a specific product.
Sustainability Reporting	Laws that require companies to disclose sustainability related information in their financial reporting. It often has two dimensions: the impact of the company and its activities on ecosystems and people and how sustainability issues affect a business. It requires advanced knowledge of the supply chain.
Claims Substantiation	Laws that require companies to substantiate any environmental or social claims made with reliable and relevant evidence. If companies want to make marketing claims related to the material composition of their products, they need to establish a proper material traceability system.
Advanced Consumer Information	Laws that require companies to label their products with very detailed sustainability information. The requirements can be around environmental scoring (with a calculation methodology), circularity (recyclability, recycled content), traceability (country of the different manufacturing processes) and other sustainability information (harmful substances, microplastics release). These laws require gathering very granular data about the product life cycle, for which product traceability will be a minimum requirement.

Due Diligence & Traceability and Product Traceabilty requirements will come into effect first. These are followed by Advanced Consumer Information Requirements for companies selling in France, expected in early 2023, Sustainability Reporting requirements in late 2023 and the Claims Substantiation requirements during 2024. On the following page, you will find an overview of the different groups of legislation, what countries they are made in and relevant to, and the specific laws included in the overview.



How to read the graph

The colored stripes represent different types of requirements. Their position on the graph signpost when the first requirements of this type are expected to be mandatory.

More detail is brought by the geographic bubbles placed along these stripes. Each bubble represents a legal text, it can either be a law that has been adopted or a legislative proposal that had not been adopted yet. Their position signifies when their first requirements are supposed to be applied (not their publication date).

The bubbles that are made of one flag mean that the law represented applies to companies based in the country designated by that flag. (Sometimes, local subsidiaries of foreign companies can also be included).

The bubbles that show the world + a flag mean that the law represented applies to companies selling goods or services in the country/region designated by the lag, regardless of where they are based. For example:

US Companies are concerned by the act

Companies doing business in the US are concerned by the act

The below laws are the ones covered in the graph:

1 – **Dutch Child Labor Due Diligence Act:** This Act is a Child Labor Due Diligence Act. It was adopted in 2019 and is supposed to be enforced mid-2022.
2 – **Norway Transparency Act:** This Act is a Human Rights Due Diligence Act. It was adopted in 2021 and will come into force from July 2022.
3 – **German Supply Chain Due Diligence Act:** This is both a Social and Environmental Due Diligence Act. It was adopted in 2021 and the first requirements will be enforced in 2023.
4 – **EU Corporate Sustainability Due Diligence Directive Proposal:** (Also known as Sustainable Corporate Governance Initiative); This proposal is both a Social and Environmental Due Diligence Act. It aims to harmonize all the Due Diligence requirements at EU level. The proposal was published in 2022 and we can expect it to be in force around 2025. It needs a delay to be adopted and then to be transposed in the Member States' law (as it is a Directive).
5 – **US Uyghur Forced Labor Prevention Act:** This Act is a Withhold Release Order issued by the US Customs and Border Protection. The Customs will withhold all cotton products suspected of having been manufactured in whole or in part in the Xinjiang Uyghur Autonomous Region. The Act was adopted in 2021 and will enter into force in June 2022.
6 – **EU Corporate Sustainability Reporting Directive Proposal:** This proposal standardizes requirements for sustainability reporting. Companies will have to report both on their impact on people and the environment and on how these issues affect their activities, strategy and positioning. The proposal was published in 2021 and we expect its requirements to apply from the 2024 reporting (for 2023 fiscal years) as is stated in the proposal.
7 – **US SEC Proposal for Climate Related Disclosure Rules:** This proposal defines sustainability reporting requirements for listed US companies. The requirements are similar to the EU CSRD (6) but companies will have to include their GHG emissions in the section about their impact on the environment. The proposal was published in 2022 but we can expect the first requirements to apply in 2024 for the 2023 fiscal year as stated in the proposal.
8 – **EU Empowering Consumers in the Green Transition Directive Proposal:** This proposal aims to tackle unfair and misleading social and environmental claims. In other words, it aims to prohibit "greenwashing". The proposal was published in 2022 and we can expect the first requirements to be applied between 2024 and 2025.
9 – **French AGEC Law:** This law adopted in 2020 amended the French environmental code with an article that will require companies putting waste-generating products (including textiles) on the French market to inform consumers about the environmental characteristics of products. An implementation decree published in 2022 sets the enforcement date of the first requirements in January 2023 (for companies with the highest turnover in France for such products).
10 – **French Climate & Resilience Law:** This law contains one chapter with the aim to make environmental scoring mandatory for some categories of products. Textile is identified as one of the priorities. It was adopted in 2021 but we can expect its first requirements to be binding around 2025-2026 as the scoring methodology and the database are yet to be defined.
11 – **EU Ecodesign Requirements for Sustainable Products Regulation Proposal:** This proposal will define a series of ecodesign and information (Digital Product Passport) requirements for different categories of products. Again, textile is a priority sector. Depending on what will be stated in the implementation acts, the information requirements (DPP) for textiles can be very granular. The proposal does not include environmental scoring requirements yet, but we expect a similar obligation to be included in information requirements in the years to come. The main regulation will probably be adopted around 2024, then separate acts will be published tackling different product categories. This leads us to expect environmental labeling requirements for textile around 2027.

Please note, the New York State Fashion Act and the FABRIC ACT are not included in the overview, as it is still unclear if and when they will come into force.
To learn more about these and other laws in greater detail, visit the TrusTrace Knowledge Hub.

Transparency and Communication

Communicating product-specific impact data to consumers is no mean feat — even the biggest brands in the world struggle to get it right. This is because brands are attempting to condense and simplify incredibly complex information, and lots of it.

In 2021, the UK's Competition and Markets Authority (CMA) found that 40% of 500 consumer goods brands were making misleading claims about their sustainability credentials online. A 2022 survey of executives across different industries, which was conducted by the Harris Poll for Google Cloud, found that "58% agree that green hypocrisy exists and their organization has overstated their sustainability efforts." It's easy to see why 62% of consumers distrust sustainability information provided by brands, according to a 2021 survey from Changing Markets.

Greenwashing

Greenwashing is rife in fashion, and it's setting the sustainability movement backwards. "I believe greenwashing has been in existence as long as the compliance industry has," says Maeve Galvin from Fashion Revolution. "Fundamentally, there is significant market value in 'guilt-free' shopping and greenwashing is a means for brands to satiate consumers that their products are the exception rather than the rule. Greenwashing feeds directly into the enormous need many mainstream consumers have to be told 'where' to shop, as if it resolves the problem." Following its latest global review, the CMA released the Green Claims Code in 2021 to combat greenwashing with six recommendations for brands to align their marketing claims with. In order to comply with laws, claims must be truthful and accurate, clear and unambiguous, must not omit or hide important information, must only make fair and meaningful comparisons, must consider the full life cycle of the product, and must be substantiated.

Fashion Revolution's Tips to Comply with Greenwashing Laws

- **Audit existing claims.** When making a claim like "carbon neutral", it is vital that brands substantiate this with audits and make information on their time-bound and measurable targets and progress publicly available. Brands should review their marketing communications against the CMA's Green Claims Code to see if it could stand up to the scrutiny of the public.

- **Make information more accessible.** It is impossible to communicate all the information related to the sustainability of a specific item, which is why QR codes are a great way to connect consumers with the information to support claims.

- **Integrity.** Brands and retailers must be prepared to take responsibility for any misleading claims but they should not be making them to begin with. Brands should not be reserving compliance for when they are scrutinized and held accountable legally. To better facilitate this, there needs to be better communication internally as oftentimes, product design, marketing and sustainability teams work in silos. It is important that teams are transparent and aligned with their communications and the information needed to substantiate claims.

Information Dumping

Another barrier preventing consumers from understanding the green claims of a brand is the practice of information dumping. This can happen when brands don't know what information is relevant and interesting to their consumers, so they share everything. "Some big brands communicate their human rights and environmental efforts in a way that is overwhelming, impenetrable, repetitive and difficult to find, making it virtually impossible for their customers and stakeholders to decipher information that is meaningful and actionable," reported the 2021 FTI.

"Sometimes crucial pieces of data are hidden in annexes and footnotes of long technical reports or buried dozens of clicks away from the homepage of their website. At other times, there is so much information to read through…that it almost seems like a deliberate strategy to obscure and distract," reads the report. Whether intentional or accidental, information dumping occurs when brands are unable to communicate in a clear, accessible manner that educates curious consumers, rather than confusing them.

Communicating Product-Specific Impact Data

Before you communicate product impact data, you have to measure it. Across the industry, the adoption of measurement tools is still relatively low, therefore reporting on specific product impact data is scarce.

According to the 2021 FTI, of the 250 brands reviewed:

- 3% of brands disclose the percentage of products that are designed to enable closed-loop or textile to textile **recycling** at end of life.
- 62% of brands publish their carbon footprint for their own operations and facilities.
- 31% of brands publish annual **water footprint** in owned and operated facilities. This drops to 14% at the manufacturing/processing facility level and 5% at the raw material level.
- 10% of brands publish time-bound, measurable commitment to zero **deforestation**.
- 27% of brands disclose their approach to **achieving living wages** for supply chain workers. Only 6% publish annual progress towards paying living wages and 1% publish the number of workers being paid a living wage.
- 25% of brands publish measurable, time-bound targets for the reduction of textiles deriving from **virgin fossil fuels** and 18% of brands publish annual progress to achieve this.

"When communicating product impact with consumers, it's important to ensure that your marketing efforts are authentic, transparent and relatable," says Akhil Sivanandan, co-founder, co-CEO, and CCO of Green Story, a Dutch company that conducts Life Cycle Assessments and communicates product impact for brands like Esprit, ThredUp, and PANGAIA.

"Making fair and meaningful comparisons when communicating a product's environmental performance is useful information for consumers," says Sivanandan. "When communicating your product comparisons, be sure to make this fair and outline what exactly you are saying has a better impact, as well as providing data to support this, in order to avoid accusations of greenwashing." Green Story communicates product impact with equivalences (X product's positive impact is equal to Xkms of driving emissions avoided) and actuals (X product's positive impact is Xkgs of CO_2e avoided), to connect with consumers in accessible but accurate terms.

> When it comes to sustainability claims, brands not only must be able to respond to consumers' doubts, **but also be mindful of upcoming green legislations.**
>
> 
>
> **Akhil Sivanandan**
> Green Story

Sustainability Beyond the Corporate Level

Sustainability policies and initiatives have been commonplace for the last decade, but have failed to make any tangible dent in the industry's environmental and social impact.

This is because true sustainability goes beyond corporate social responsibility and touches every part of the supply chain, down to the fiber level. "When it comes to beyond tier one of the supply chain, traceability can prove challenging," says Galvin from Fashion Revolution. "However, this is precisely why we believe that brands need to look beyond their own singular supply chain and examine the wider system their product is a part of. Investing in direct relationships can help traceability where existing technology lacks."

Calculating Business Emissions

The 2021 FTI reported a 4% year-on-year increase in brands disclosing the annual carbon footprint of their own facilities and operations (known as Scope 1 and 2); however, up to 80% of the sector's carbon footprint occurs in Scope 3, where the raw material sourcing, processing, and assembly occurs.

By failing to account for Scope 3 emissions in carbon footprint analysis, brands aren't giving the full picture of their environmental impact. In April 2022, the Guardian revealed that brands that work with the CDP (formerly known as the Carbon Disclosure Project), an independent environmental performance organization, were calculating carbon emissions against total revenue. "This means that as long as their emissions increase less than their revenue increases each year, the total emissions are scored as a decrease," wrote journalist Rachel Donald.

Calculating Scope 3 emissions is clearly a huge challenge for brands, one that revolves around procuring large amounts of data from their suppliers. A leading body in helping brands understand how to track their emissions is the Greenhouse Gas Protocol, which sets the standards by which brands can measure their emissions. In 2016, 92% of Fortune 500 companies used The Corporate Accounting and Reporting Standard (Corporate Standard) from the GHG Protocol to calculate their Scope 1 and 2 emissions. The GHG Protocol has also published Scope 3 Calculation Guidance in partnership with the Carbon Trust, which they say is "the only internationally accepted method for companies to account for these types of value chain emissions."

Internal Drive

A 2020 census from Unily of 2,000 UK workers reported that 65% of respondents wanted to work for a company with a strong environmental policy, however, 83% believed their employers weren't doing enough to fight climate change. As environmentally conscious Millennials and Generation Z begin to dominate the workforce, it's important that businesses align with their values and expectations in order to attract and retain talent.

External Pressure

In recent years, sustainability has become an increasingly important consideration for consumers. 63% of shoppers have made "modest to significant shifts towards being more sustainable in the past five years," according to a 2021 Global Sustainability Study by Simon Kucher & Partners. This is driven by Millennials, 32% of which have made significant lifestyle changes to be more environmentally conscious.

In 2021, IBM found that the pandemic had a significant impact on 9 in 10 consumers' views of environmental sustainability — even more so than natural disasters. 34% of those surveyed by Simon-Kucher & Partners were also willing to pay more for eco-friendly products, further proving that investment in sustainability is good for business.

Organizations like Fashion Revolution have also been instrumental in pressuring legislators and brands. "As activists, we need to convince consumers that the problem can only truly be resolved by transforming our entire relationship with clothing consumption and ultimately the functioning of the entire fashion industry," says Galvin.

A Call for Collaboration

The challenges facing the fashion industry cannot be tackled alone. Industry-wide collaboration, not competition, is vital to achieving wide-scale improvements.

"The potential of more collaboration where brands use their shared economic power for greater impact is vast," says Galvin. She points to policy-making in production countries, supporting joint price negotiations for better wages, or shared investment in greener technologies to support the transition from fossil fuels, as areas that brands could collectively influence include policy-making in production countries. "We advocate brands sharing resources and collaborating to converge standards and reduce the burden on suppliers as much as possible," says Galvin.

With so many players in this dynamic ecosystem, from farms to factories and beyond, accurate and granular data is the key to revolutionizing the industry. Digitizing, democratizing and standardizing data should be the top priority of fashion brands, retailers, suppliers, and factories. In the next section, you'll learn how to identify where your business currently stands in relation to traceability. By situating your business within the TrusTrace Levels of Traceability, you can understand how to best leverage traceability to accelerate your journey towards sustainable transformation.

> Real collaboration has practical and economic value, **as well as the potential for major impact.**
>
> 
>
> **Maeve Galvin**
> Fashion Revolution

Within TrusTrace's Three Levels of Traceability

The Three Levels of Traceability

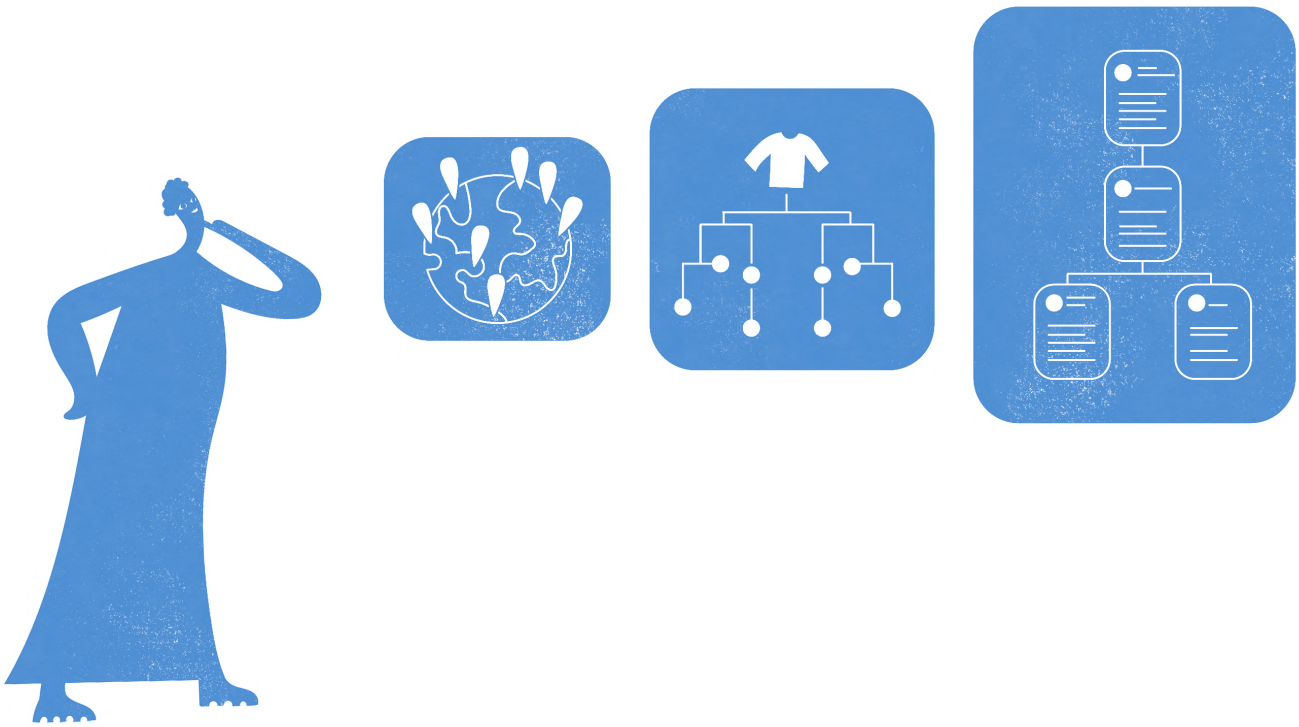
We've covered the fundamentals of traceability, now we're ready to dive into how you can actually achieve it. In this section, you'll learn about how traceability can help you to achieve your sustainability goals by understanding the different methods for tracing your supply chain.

Every fashion business will have a unique traceability journey, as each has its own specific ambitions and commitments. What's right for your business will depend on where you are in your sustainability journey already — some of the deeper levels of traceability require a certain degree of maturity and readiness. We understand that beginning this journey can be a daunting task, so this guide is here to demystify and simplify the process.

The TrusTrace Levels of Traceability have been devised using the knowledge and insight we have gained since we began supporting fashion businesses through their sustainability transformations in 2016. Consider this your guide to evaluating the traceability solutions that are right for you.

Each level of traceability takes you a little deeper into the supply chain of your products, from the factory that supplied trimmings to the farm that grew the raw materials. Envisioning this journey as a series of levels can help us to understand that traceability is about a step-by-step progression towards sustainable transformation.

We separate traceability into three distinct but interconnected segments: the supplier, product, and material levels. In this chapter, we'll unpack what you can expect and achieve from each level. Additionally, you'll be able to understand the difference between manual and digital traceability solutions, learn more about Chain of Custody methods, as well as the benefits and challenges of product backward (top-down) and fiber forward (bottom-up) solutions for achieving traceability. In short, you'll be able to identify the levels and methodology that are right for you.



Manual vs. Digital Traceability

Manual Traceability

Most brands start out their traceability journey with what we call manual systems, achieved by sending emails and collecting data in Excel spreadsheets. This works when a brand is collating general information about its suppliers, but as you scale your ambitions for system-wide traceability, manual systems will prove unsuitable.

For example, if working with certified materials, a large fashion brand can process 500,000 certificates between certified tier 1 suppliers to the final product purchase order each year. We calculate that it would take one person 19 years, or 41,667 working hours, to complete this task manually. Manual systems also result in fragmented data that is low on detail and not easily shareable across functions. Large brands will find it difficult and inefficient to communicate with and build profiles on all their suppliers, as tracing beyond direct suppliers manually would become time-consuming and complex. Luckily, digital traceability provides a solution to this.

Digital Traceability

Sustainability is no longer an independent function within a fashion business. A brand's ability to improve the sourcing strategies aligned to their sustainability goals will be severely limited if they have an audit report or a scope certificate in an email, but don't link the expiry details with the supplier information. This is where a digital traceability system comes into the picture.

A digital traceability system helps brands collaborate with suppliers across tiers on a near real-time basis, so that brands and suppliers can exchange details about their supply chain, products, and materials. Through the system, this data is consolidated and made available for all functions to see, making it much easier for sourcing, production, legal and compliance teams to collaborate and act on the information. A lot of data that is required for traceability is currently available in PDFs (like audit certificates, transaction certificates, or invoices around the chain of custody) so digitizing this information is one of the first steps in the traceability journey. When a social audit certificate is digitized, brands can easily keep track of the certificate's validity, as well as which of their supplier facilities are covered by it. Major issues that conflict with the brand's goals can be tracked and analyzed so that corrective action can be taken.

As new regulations are emerging, the need for high quality, granular data about the materials and supply chain is ever increasing. Any claim that is made on a product today requires specific data to back it up. For example, a material content claim, such as the percentage of recycled polyester in a product, will require data about the complete material chain of custody.

To implement traceability at scale for cases like this, a digital traceability system should have intelligence on which product should be traced, what data needs to be collected, and from whom. This intelligence comes from product, supplier and order data that is already stored in Product Lifecycle Management (PLM) and Enterprise Resource Planning (ERP) systems, which can be integrated with a digital traceability system, ensuring a continuous flow of up-to-date information. With this automated digital solution, brands achieve traceability at scale and reduce the amount of time spent collecting data, so time can instead be spent analyzing that data and developing data-led strategies.

As traceability becomes critical across materials, it is imperative to replace the current paper-based transactions, including material certification processes by third parties, with digital ones. This requires a decentralized, robust and secure technology like Blockchain. Blockchain helps to establish the authenticity of material certifications as well as proof of ownership at any given point in time and is completely tamper-proof. Through blockchain-enabled product passports, suppliers, brands, consumers, certifying groups, recyclers, and other players in the fashion ecosystem have access to encrypted, decentralized and evidence-based information throughout the lifecycle of a product. It is important to note, however, that blockchain in itself is not a magic bullet, and although it enables decentralization and collaboration around data, this will not matter if the data in question is not granular, accurate, and up to date.

Considering that the fashion industry uses a vast number of materials and a highly distributed supplier network, there won't be a single traceability system across the entire industry, but rather an ecosystem of players that interact to form different solutions pending on brand or industry needs. For example, traceability data for different materials can be stored with different standards bodies, in supplier systems and traceability software systems, but to achieve industry-wide traceability and visibility, all these systems must eventually be able to work together. To ensure this seamless data exchange, all traceability systems should adhere to standards like GS1.

The major benefit of a digital traceability system is that it provides a single source of truth about a product across the network, from suppliers and brands to retailers and consumers. It helps the entire industry to analyze, act and improve its sustainability efforts. Here are some specific benefits to suppliers and brands:

Benefits for Suppliers

- Avoid spending time sending and keeping track of individual emails and documentation per sub-supplier
- Have agency over their own information, which can easily be updated and shared with multiple brands
- Keep documentation up to date: digital systems automatically track and remind suppliers to upload new certificates when old ones expire
- Have proven sustainability credentials, which can improve competitiveness and access to sustainable financing opportunities

Benefits for Brands

- Saves a LOT of time
- Enables automated data collection from suppliers
- Makes data available to everyone across business functions
- A single data source eliminates the need to validate and consolidate data across multiple sources and systems
- Enables brands to make and back up compliance claims about their products and materials
- Ensure that certificates documentation is up to date: Automatically track and remind suppliers to upload new certificates when old ones expire, preventing fraud
- Enables automated consolidation of delivery vs. PO requirements
- Enables tracking and visualization of performance vs. targets

Level One

Getting Started: Supplier Mapping

The Basics

- Gather all your supplier information in one place
- Gain an overview of suppliers in some or all stages of the supply chain
- Identify, monitor and analyze supply chain risks across tiers to ensure sustainability standards are met
- Keep track, send out, and collect audits & certifications
- Create scorecards and perform due diligence and ESG reporting

Why?

Supplier Mapping is a good starting point for transparency efforts, primarily because it helps to comply with due diligence laws around the social and environmental impact of your supply chain. Collecting social and environmental evidence, and keeping this information easily accessible, is one of the main requirements in all due diligence laws. Brands with internal strategies to improve sourcing and gather data from suppliers in an automated manner will also benefit from this level of traceability.

What?

Supplier Mapping is the first step in any business's traceability journey as it allows you to gain an overview of all the potential suppliers in your network, and document everything from their energy use to the labor conditions in their factories. You can also record and analyze third-party audits to understand and improve the ESG performance of your suppliers. At this level, you're able to identify the risk areas in your supply chain, gather evidence to help you mitigate these risks, and make claims at a corporate level about your supply chains. Supplier Mapping can help you identify whether or not your supply chains are powered by renewable energy or do not include child or slave labor.

How?

Supplier Mapping is achieved by asking your direct suppliers to provide information about their suppliers, who in turn ask their suppliers for information, and so on. You can continue on until you reach the tier where you source your raw materials (usually tier 4 to 6), or stop at a particular tier that is relevant to your needs. How much of your supply chain you map depends on a number of factors. These include the depth of information you need, whether your suppliers work with certifiers and auditors, the complexity of your supply chain, how much time and money you're willing to invest, and your ability to collect and store the information you request. It also requires a high level of trust and cooperation from your suppliers to provide information.

The key information that is collected during Supplier Mapping includes:

- Suppliers and facility details across tiers
- Social data about suppliers and facilities
- Social, environmental and material related certifications and audit reports
- Due diligence assessments related to the social and environmental performance of the suppliers

Challenges and Limitations

Supplier Mapping will only get you so far in your sustainability journey. At this level, you will not be able to identify the value chain of individual styles or products, and you do not have the ability to identify which suppliers you are using more than others. For example, your total supplier network may include 1000 suppliers, but you may only be actively working with 500 of these. This means you aren't able to target the parts of your supply chain that need immediate attention. Supplier traceability doesn't provide you with a chain of custody for products, meaning that it's not sufficient for all types of regulatory compliance.

We encourage brands to be ambitious and consider supplier mapping as the first, not the only, step in your sustainability journey. While mapping your supply chain is essential in order to move to the next level of traceability, it should be done in conjunction with product traceability to understand your supply chains on a deeper level.

Level Two

Building Your Understanding: Product Traceability

The Basics

- Understand your product journey
- Understand the key suppliers for particular products
- Manage evidence and prove the authenticity of products

Why?

Preparing for incoming regulations on product traceability means that you will need to collect information on specific metrics at a product level: exactly where your products have traveled, the suppliers and manufacturing regions that have been involved, and the evidence to prove it. Product traceability helps to build granular information of a product's journey which brands can leverage for compliance and their transparency initiatives.

What?

Product Traceability gives you a retrospective view of how your products were realized from raw materials to finished goods, and is typically traced from the finished product backward.

> **Product backward** traceability is achieved by tracing the supply chain of a product after it has been manufactured. It is suitable for making general claims about your supply chain, and for products made with materials that are considered low-risk or are unregulated. However, because the data can be documented up to six months after the product arrives to market, product backward traceability is considered less reliable, as certain assumptions and generalizations have been made in the data gathering process.

You'll be able to identify exactly what the supply chain looks like for your product, tying all the evidence from supplier mapping to the product you are tracing. Evidence for certified materials, such as transaction certificates, come with a lot of data readily available.

They follow a Chain of Custody (CoC) model documenting the origin, components, processes, and handlers of the materials throughout the supply chain. However, if you are working with products that lack third-party certification or involve high-risk risk supply chains where CoC has not yet been established, you can use product traceability to understand your product supply chain better, as a way to prepare for traceability at the material level, through which the CoC can be established.

Product traceability can be used to make general claims about a certain product that isn't tied to a specific batch of production. For example: It's frequently used for making sustainability claims for leather products. Leather is connected to certain environmental risks such as chrome usage during the tanning and dying processes, as well as deforestation (specifically in the Amazon) caused by cattle farming.

Both of these risks can be addressed by providing additional evidence of chemical certification, as well as a country of origin declaration from the supplier, which will help brands to make claims like "Our suppliers are certified to be chrome-free." Product Traceability is not sufficient to make specific claims on the product, only supply chain-related claims like certifications.

How?

Product traceability is achieved through the same methodology as Supplier Mapping (which is a prerequisite to this level), only the data extracted is more granular, down to the product or style. You can visualize this as a tree of information that contains a product at the top and branches that represent every supplier that has contributed to its production.

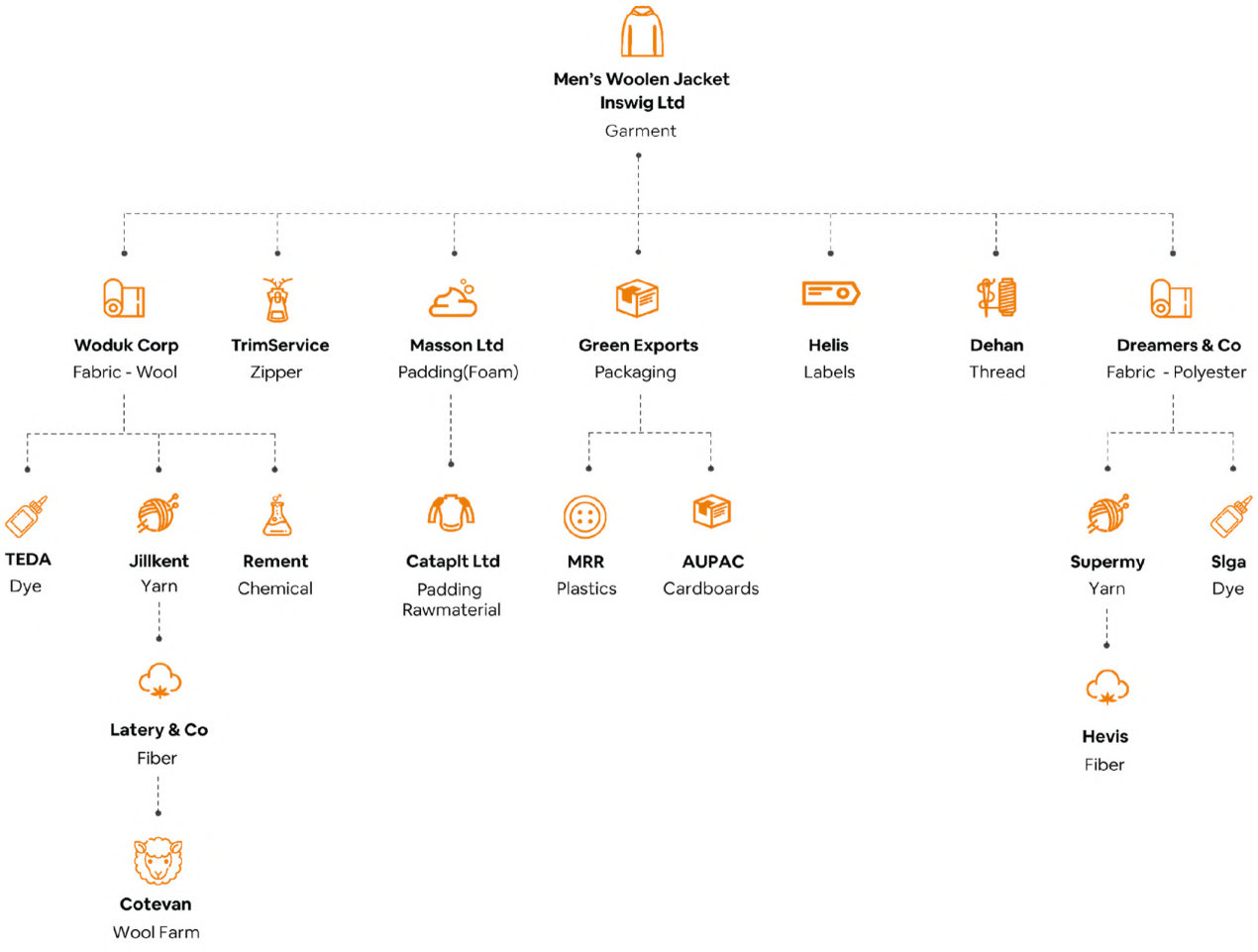
This tree is much smaller than the overall supply chain map that you can achieve through supplier mapping, narrowing in on specific products and their associated suppliers. When done manually, Product Traceability is challenging to achieve beyond tier 2 and can become a time-consuming task (depending on the breadth of products being traced) that requires cooperation from your direct suppliers. When done digitally, product traceability is much more easily scaled beyond your direct suppliers through automated evidence requests.

The data usually collected through Product Traceability includes:

- Granular bill of material information for the product
- Supply chain information of a product and materials across different tiers
- Specific declarations related to raw materials or processing methods used by suppliers
- Material certificates and quality reports related to the product

Challenges and Limitations

Like Supplier Mapping, Product Traceability only gives you part of the picture, as it does not tell you details about the content of your products, not does it collect data in real-time, meaning the evidence is often not available until several months after the product is finished. It is insufficient to make material-based claims or provide you with weight-based calculations on your product material compositions, especially when there is no third-party certification available for the material.



Level Three

Compliance Ready: Material Traceability

The Basics

- Substantiate claims about the material composition in your product
- Verify the weight-based material composition of your product
- Understand the waste that occurs in your production
- Verify that you received what you ordered and that the items deliver on the Bill of Material (BoM) from the product Purchase Order (PO)

Why?

While brands are transforming their sourcing strategies to include more sustainably produced materials and making claims about it to the market, there is still a significant gap in backing up these efforts with data. Currently, brands rely on standards and certification bodies, but not all materials are covered by standards and certificates. Because a large number of suppliers have not yet adopted them, the certificate chain is not always present until the finished product. Material traceability helps solve this challenge by providing direct control of the materials that are sourced and building a CoC that provides assurance for the claims you are making.

What?

Material Traceability goes beyond basic supplier or product traceability and is concerned with the contents of your products, diving deep into your supply chains where raw materials are sourced. It's based on the Fiber forward model which means that you're able to make claims about the specific material content on a product by product basis, with the chain of custody to prove it.

If your business has made commitments to science-based targets, such as switching to 100% recycled polyester or increasing the number of sustainable materials used across your product offering, you will need to achieve Material Traceability. Compliance is a major driver in embracing Material Traceability, because it gives you the ability to prove material claims and comply with regulatory requirements.

> **Fiber forward** traceability refers to tracing a product from the raw material to the final product. As the material Lot moves up the value chain, each handler is proactively recording critical details about the Lot and its associated claims. These details are passed onto the next tier, forming a chain of custody. As the data is registered when the movement of materials happens, it is more accurate and verified than the retrospective data of product traceability, and it is readily available together with the final product. Any external disruptions or changes to the suppliers and materials will be registered in real-time and brands can act before the product reaches them. Fiber forward traceability is especially suitable for multi-component products, such as trainers, which could otherwise be cumbersome to trace backward from the finished good.

Chain of Custody Models

To implement Fiber forward traceability, brands should choose the right Chain of Custody model based on the specificity of the claim being made.

> A simple definition of Chain of Custody is the chronological record of a product's origin, components, processes and handlers throughout its lifecycle.

In fashion supply chains, **Product Segregation** and **Mass Balance** are two frequently used Chain of Custody models. Product segregation means that the certified raw material is physically

separated from non-certified materials throughout the whole supply chain, which makes this a more accurate approach than Mass Balance, where the certified and non-certified materials can be mixed along the supply chain.

Even though Product Segregation is the more accurate option, Mass Balance is less complex to implement, and brands might choose to use both models, depending on their ambitions. For more specific product claims such as “this product contains 40% recycled material”, you want to ensure that the content of that particular product is exactly 40% recycled material. Using Mass Balance, you would only be able to claim something along the lines of “This brand uses 40% materials from recycled sources.”

How?

To achieve Material Traceability, brands must collaborate with suppliers to document all of the materials that go into a product through the manufacturing process, along with reports and declarations that substantiate claims at each step.

For example, if you want to make a material specific claim related to leather, saying “This product uses leather that is chrome-free” the leather tanner must provide a facility certificate confirming that they are not using chrome, as well as a quality report for the batch of leather getting shipped downstream which confirms that the leather is chrome-free. This must be linked with the finished product to make the claim. To achieve this, downstream suppliers should record the usage of the specific chrome-free leather at every step till the finished product.

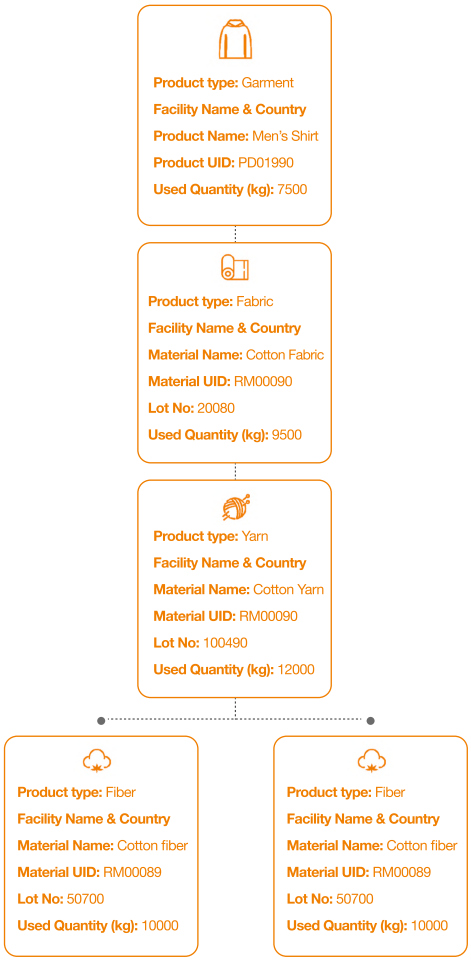
Fiber forward traceability that uses the Product Segregation CoC model provides you with data on each batch, which is available when you need to substantiate claims for sales and marketing, or prove a batch’s compliance with regulations when it goes through customs and into the market.

Achieving Material Traceability requires some level of tech maturity because, in order to gather millions of data points, you need a system that can process this amount of information. To make the process smoother, we recommend having all the data on the product style, material and PO available in a PLM or an ERP system.

Challenges and Limitations

As Material Traceability requires collaboration with suppliers to document the materials going into the manufacturing process of a product, brands need to have a direct relationship and ability to communicate with their suppliers through all the tiers they want to trace. If a brand is one out of many customers of a supplier, it may require collaborating with other brands who source the same materials from the same supplier, to reach a critical mass that will make it worthwhile for that supplier to engage in Material Traceability.

While digital traceability systems provide the CoC data at a digital level, technologies that trace the physical product, as covered earlier in the playbook, are also critical to get more accurate results. The best approach will be to combine several sources of data and knowledge. Ultimately, the more accurate, verified data that can be gathered on the full value chains of products and materials, the better-equipped fashion businesses will be to take meaningful action and accelerate sustainable transformation.



What's Next?

What's Next?

The systemic issues facing the fashion industry cannot be solved by single individuals or organizations. It calls for buy-in and collaboration of the entire ecosystem, from brands to standards bodies, suppliers to farms, and beyond. The industry has the will to solve these problems, and now we have the tools.

Sustainable transformation doesn't happen overnight, but the more accurate, granular data you have, the faster your transformation will be. No matter what your company policies and commitments are, ultimately consumer demand, regulations, and market dynamics will push fashion businesses to achieve system-wide traceability.

> Many of us are talking about the issues in fashion's supply chains, but there are also issues with overconsumption and circularity that we need to address. We all know there are problems, but **until data is available and accessible to everyone, we can't identify them or prioritize them correctly.** In the coming years, we need to focus more on creating data visibility for the end-to-end impact of our choices. **We should be looking at the full cycle from fiber to end of life and back to fiber, considering not only the impact of production itself, but the length of a product's lifespan before it's reused or recycled.** The data about the entire value chain and its impact will be much more transparent and will help drive transformation in a focused manner.
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> **Madhava Venkatesh**
> CTO and Co-Founder of TrusTrace

Fashion brands have the data they need to start tracing their supply chains, and tech platforms are quickly rising to the challenge. Traceability providers are not stand-alone systems. They are expanding their ecosystems to incorporate other sustainability solutions and data providers, taking fragmented data and making it visible and accessible for everyone, all in one place.

If brands start to adopt this and work with sustainability data, alongside product design and inventory management, then they will get closer to understanding the impact of their business, and changing it for the better.

When the fashion industry works collectively towards a shared goal of sustainable transformation, there's no telling what we can achieve. Some brands will be further along on this journey than others, but everyone can make a real difference by making the right choices based on solid data. Our hope is that this playbook helped you see how you can take the next step in your journey to accelerate sustainable transformation.

Glossary of Traceability Terms

- **Batch-level or Lot-level data:** Granular information pertaining to a defined quantity of a material or product that is processed together.
- **Bill of Material (BOM):** This is a list of the raw materials and components, plus the quantities of each, needed to manufacture a product.
- **Blockchain:** A digital ledger of transactions that is duplicated and distributed across the entire network of computer systems.
- **Corporate Social Responsibility (CSR):** This is a form of self-regulation that businesses use to instigate philanthropic, activist, or charitable initiatives whereby they engage in or support volunteering practices.
- **Certificate of Origin:** This is proof that a product was manufactured in a specific country or region, used to comply with due diligence legislation.
- **Chain of Custody (CoC):** As materials move through the value chain, a Chain of Custody can be created by each handler by recording critical information about the lot and its associated claims.
- **Circularity:** A model of production and consumption that focuses on sharing, leasing, reusing, repairing, and recycling existing materials and products for as long as possible.
- **Compliance:** Adhering to requirements that are decreed by laws and regulations.
- **Decentralized Data:** The process of attaching data to a product, rather than the owner of a product, using blockchain technology.
- **Digitization:** The process of converting, streamlining and converging analogue information from emails, PDFs and Excel spreadsheets into a digital format on a unified system.
- **Due Diligence:** The process of auditing your supply chain to identify, mitigate, and account for potential environmental and social issues.
- **Enterprise Resource Planning (ERP):** A software system that allows brands to manage everyday business operations like accounting, supply chain operations, compliance and risk management.
- **Environmental, Social, and Corporate Governance (ESG):** A measurement that companies use to evaluate the extent to which their operations impact three core pillars of sustainability.
- **Evidence request:** The process of contacting suppliers, either digitally or manually, to ask for information about their operations in relation to a specific risk area.
- **Fiber Forward Traceability:** This refers to the bottom-up process of tracing a product from the raw material phase to the end product in real-time.
- **Fragmentation:** This refers to data that has been broken up into different formats or across different platforms, leading to inefficiencies and inaccuracies.
- **Hard technology:** This refers to asset-intensive, physical, science-based technology, including innovations that integrate into existing production systems.
- **Life Cycle Assessment (LCA):** A methodology for assessing environmental impacts associated with all the stages of a product's life, from manufacturing to disposal.
- **Legislation:** Laws and regulations made by a government that businesses must adhere to.
- **Material-based claims:** This refers to any declaration made by a business relating to the materials used to manufacture their products.
- **Product Backward Traceability:** Otherwise known as top-down traceability, this refers to the process of tracking the supply chain of a product after it has been manufactured.
- **Product Lifecycle Management (PLM):** Organizations use this to develop new products, as well as track and share data along the entire supply chain.
- **Purchase Order (PO):** This is a document issued by a brand to a supplier which indicates the styles, quantities, and prices for products they have purchased.
- **Real-time data:** This refers to when information is collected about a material or product, in this case, it is recorded as the item moves through the value chain.
- **Scalability:** This refers to the ability to expand or increase the implementation of a system or operation to a system-wide level.
- **Soft technology:** This refers to digital B2C solutions like rental and resale platforms, as well as B2B solutions like traceability software.
- **Standardized data:** This refers to the process of establishing common identifiers so that multiple systems auditing different or overlapping issues can exchange and collate information.
- **Supplier:** A supplier is any actor within a supply chain that is involved in the sourcing, manufacturing, or transportation of a material or product.
- **Sustainable financing:** This refers to the acquisition of financial resources to implement improvements to facilities with a businesses supply chain.
- **Third-party audits:** This refers to independent groups that perform on-the-ground assessments of facilities to ensure that they're working in compliance with certifications.
- **Tier:** Supply chains are commonly divided into tiers where different functions are performed to transform raw material into a finished product.
- **Traceability:** The ability to trace the history, application, or location of a material or product through recorded identifications.
- **Transparency:** The relevant information that is available to all elements of the value chain in a standardized way, which allows common understanding, accessibility, clarity and comparison.
- **Weight-based calculations:** This refers to the measurement of a material or product by its weight in order to determine the content make-up and instances of material wastage.

For more information and insights, or to start your traceability journey, visit TrusTrace.com.