



FASHION ENVIRONMENTAL ACCOUNTABILITY ACT: A4631-B

WORKSHOP IN APPLIED EARTH SYSTEMS MANAGEMENT

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EXECUTIVE SUMMARY

THE FASHION ENVIRONMENTAL ACCOUNTABILITY ACT: A BLUEPRINT FOR GLOBAL INDUSTRY REFORM

The fashion industry, long recognized as an engine of economic growth and cultural expression, has become increasingly scrutinized for its environmental and social impacts. In response, the New York State Legislature introduced Assembly Bill A4631-B, The Fashion Environmental Accountability Act of 2025, to regulate the environmental footprint of large fashion companies and place New York at the forefront of global environmental accountability. The bill mandates clear, enforceable standards to hold fashion sellers accountable for global environmental and social impacts through a due diligence process that includes supply chain mapping (Tiers 1–4), annual greenhouse gas inventories, wastewater testing, and stakeholder engagement.

Compliance is overseen by the New York State Attorney General’s Office, Department of State, and the Department of Environmental Conservation, and enforced through fines and penalties applied to a Fashion Remediation Fund designed to finance environmental restoration.

Although the bill provides a plan for improving accountability and reducing environmental impact, implementation challenges remain. Nevertheless, The Fashion Environmental Accountability Act has the potential to shift industry norms, reduce pollution, promote environmental justice, and foster a global fashion industry that is environmentally and socially accountable.



Figure 2: Canva



INTRODUCTION

NEW YORK STATE ASSEMBLY A4631-B: FASHION ENVIRONMENTAL ACCOUNTABILITY ACT

New York has historically been at the center of the fashion industry. In the 19th and 20th centuries, the Garment District in Manhattan became a hub for textile production, at one time hosting the world's highest concentration of textile workers.¹ Over time, domestic production declined due to free trade policies, rising costs, and the globalization of supply chains. Today, only 2.5% of clothing sold in the U.S. is domestically made, but New York remains a global fashion capital, home to major brands, designers, and fashion events like New York Fashion Week.² The fashion industry contributes \$95 billion annually to New York's economy through direct and indirect sales.³ Though the city no longer dominates manufacturing, its design and branding power give it a unique influence over global fashion standards.

The fashion industry is an important driver for economies, but also a major force for self-expression and cultural identity. Yet, the industry has significant environmental impacts, accounting for an estimated 10% of global greenhouse gas (GHG) emissions, which is more than the combined emissions of international aviation and shipping.⁴ The industry also generates 193,000 tons of waste annually in New York, contributes to chemical pollution, and is responsible for 20% of global industrial water pollution.^{5,6} For decades, the fashion industry has operated with low regulation, relying on low-cost labor and environmentally harmful practices.

In response, the New York State Fashion Environmental Accountability Act, State Assembly Bill A4631-B, was introduced to correct this regulatory gap and set enforceable standards for sustainability and labor ethics. The bill is a bipartisan piece of legislation introduced by State Assemblymember Dr. Anna Kelles, and co-sponsored by Harvey Epstein, Jo Anne Simon, Andrew Hevesi, and Jessica Gonzalez-Rojas.⁷ The Bill requires large sellers of textiles (including clothes, shoes, and handbags) to provide annual due diligence reports to the New York Department of State on the social and environmental impact of their supply chain. It introduces legally binding requirements, including supply chain mapping, annual greenhouse gas due diligence reporting, and penalties for noncompliance. It also establishes a Fashion Remediation Fund to support environmental restoration and assist impacted communities both locally and at offshore locations.

The bill fits squarely within New York's ambitious environmental goals. The state has already passed the Climate Leadership and Community Protection Act (CLCPA), which commits New York to net-zero emissions by 2050.⁸ The fashion bill expands environmental policy into consumer industries, integrating climate justice and sustainable development into the private sector. It represents a broader approach to ensuring corporations take responsibility for the environmental impacts throughout their entire supply chain, from raw material sourcing to end-of-life product disposal.

The broader international landscape is moving toward mandatory supply chain due diligence and corporate sustainability disclosure. If passed, the Fashion Environmental Accountability Act would be the most comprehensive law that stipulates reporting standards of environmental and social indicators and impacts from fashion companies along their entire supply chain, thus setting a global precedent for fashion regulation. The bill directly affects any apparel, footwear, or fashion bag seller with \$100M+ in global revenue operating in New York.

The New York State Assembly A4631-B: Fashion Environmental Accountability Act is not just a state bill; it serves as a potential model for advancing sustainability within the global fashion industry. This bill reflects a major shift in how fashion's environmental impacts are regulated, placing responsibility on brands not just to design creatively, but to operate ethically. In a city where fashion is both an economic force and a global influencer, New York's leadership could invoke wider reforms across the globe.

PROBLEMS CAUSED BY THE FASHION INDUSTRY



Figure 4: Smog Engulfs Sanjiang Village dubbed 'Cancer Village' Shaoxing, China | Sixth Tone

Air Pollution

The fashion industry's contribution to 10% of global GHG emissions occurs throughout the product life cycle, from fiber cultivation to disposal.⁹ The direct emissions from production and retail are defined as Scope 1 emissions. Scope 2 emissions come from electricity and gas use. Finally, Scope 3 emissions include indirect emissions outside of a company's direct operations, such as from the fashion value chain.¹⁰

The main GHGs associated with the industry are carbon dioxide, methane, and nitrous oxide. These gases trap infrared radiation in the atmosphere, increasing Earth's temperature and disrupting the planet's radiative balance. Each gas varies in terms of global warming potential and atmospheric persistence.¹¹ The fashion manufacturing process also emits nitrogen dioxide from factory boilers and volatile organic compounds and particulate matter from printing and finishing processes, causing the formation of smog.¹²

GHG emissions by the fashion industry lead to global warming, climate change, sea level rise, and more frequent extreme weather events. While the global agenda is to limit global warming to less than 1.5 °C, the emission trends from the fashion industry currently do not follow this trajectory. Increasing demand in the apparel market, which is projected to rise to 134 million tons by 2030, has fueled the shift to low-cost, carbon-intensive synthetic fibers.¹³ Hence, global fiber production has been driven largely by polyesters, accounting for more than half of fiber demand. Polyesters emit 31.3 pounds of carbon dioxide per pound of fibres produced, which is seven-fold higher than the 4.2 pounds of carbon dioxide emitted from cotton.¹⁴

Water Supply and Quality Issues

The fashion industry uses approximately 93 billion cubic meters of water annually, contributing to 20% of global water pollution.¹⁵ Water is essential for growing fibers like cotton, textile dyeing and finishing, and leather tanning. However, these processes result in over-exploitation and contamination. Cotton farming in water-stressed areas significantly depletes rivers and lakes.

One example is with the near disappearance of the Aral Sea in Central Asia largely due to heavy irrigation for cotton farming driven by the global textile industry.¹⁶ Moreover, dyeing and finishing processes in the fashion industry produce wastewater, and a significant proportion is discharged untreated, leading to the contamination of surface and groundwater.

These effluents change the physical, chemical, and biological properties of receiving waters. They increase turbidity, raising total suspended and dissolved solids. The oxidation and degradation of released effluents raise the chemical oxygen demand in the water.¹⁷ In addition, the nutrient overload causes algal blooms, and this impacts the aquatic biodiversity of the waterbody, increasing fish and invertebrate mortality, and thus causing disruption of food chains.¹⁷ In addition to wastewater, the life-cycle usage of synthetic textiles discharges microplastics, which are tiny plastic particles released during washing.¹⁸ These microplastics end up in rivers, lakes, and oceans, contributing to water pollution. They persist in aquatic environments, harming marine life and the food chain.



Figure 5: Cotton Farming Driven Aral Sea Recession | The Guardian

Waste Generation

The fashion industry produces 92 million tons of textile waste per year, and New York state alone contributes to 193,000 tons annually.¹⁹ ²⁰ Most of the waste either ends up in landfills, is incinerated, or exported to developing countries. Thereafter, importing countries of textile waste, such as Ghana, the top importer of second-hand clothing, bear the brunt of managing this textile waste. While some of the textile waste is sold in second-hand marketplaces, such as Kantamanto Market in Ghana, over a third of the imported used textiles are unresalable and end up in landfills.²¹

Textile waste consists mostly of synthetic materials such as polyester and nylon, which do not biodegrade but rather persist in the environment for hundreds of years.²² In landfills, these textiles decompose anaerobically and release methane, which is over 80 times more potent than carbon dioxide.²³ Burning discarded clothing releases carbon dioxide and volatile organic compounds, which contribute to air pollution and climate change.²⁴

Fashion waste causes chemical pollution, poor water quality, and the generation of harmful emissions during decomposition and incineration. Marine organisms ingest microfibers, leading to the bioaccumulation of toxins and disruptions in aquatic food webs. Humans exposed to microplastics and toxic chemicals can cause inflammation, hormonal disruption, cancer risks, and respiratory issues, especially for communities living near dumping or burning sites.



Figure 6: Old Fadama Open-Landfill near Kantamanto Market in Accra, Ghana

Chemical Pollution

In the fashion industry, over 8,000 synthetic chemicals, including perfluoroalkyl substances, dyes, flame retardants, and other finishing agents, are used.¹⁸ The chemical substances are often unregulated and leach into the environment during the manufacturing and washing stages of the fashion supply chain, negatively impacting people and ecosystems. For instance, in Dhaka, Bangladesh, textile factories routinely dump untreated chemical waste into nearby rivers, which contaminates water and impacts the communities reliant on these rivers.²⁵

During cotton cultivation, insecticides like organophosphates, carbamates, and neonicotinoids are sprayed.²⁶ They are absorbed by untargeted plants and leach into water bodies as runoff, impacting terrestrial and aquatic biodiversity.

During dyeing and printing processes, various dyes and pigments are used to achieve desired aesthetic and functional properties. Azo dyes make up 50% of global dye use, with 15–20% released into wastewater due to inefficient binding to the fabric.²⁷ Azo dyes can break down into aromatic amines, which, along with heavy metals in pigments, are potent carcinogens. They also bioaccumulate in the shoots of the plants beyond safe limits prescribed by the Food and Agriculture Organization.²⁸ In aquatic fishes, the dye effluents cause cancer, DNA damage, and hyperexcitation.²⁹

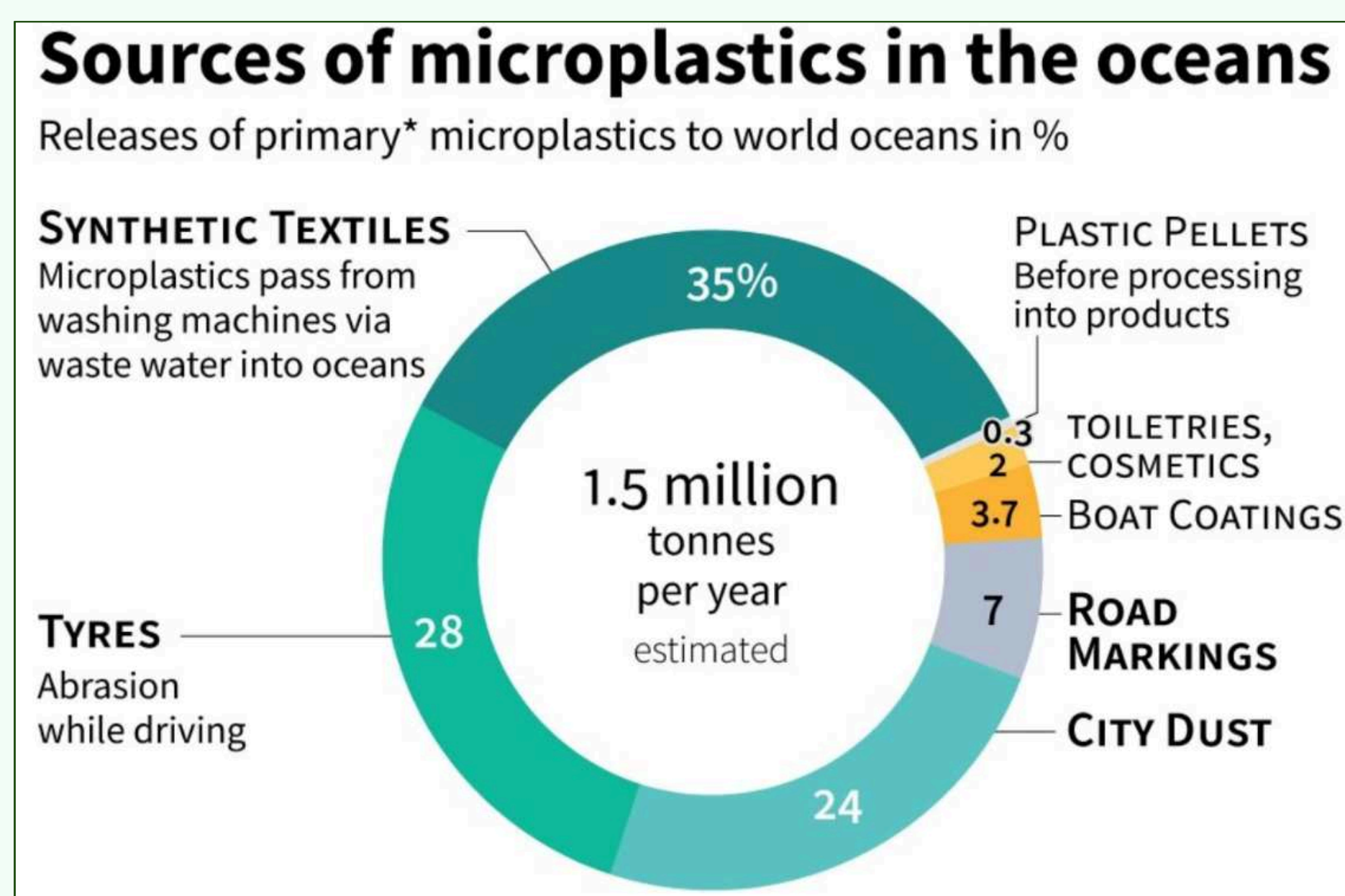


Figure 7: Synthetic Textiles as the Major Contributor of Microplastics in the Oceans | PlasticStar

In addition, finishing treatments use formaldehyde and per- and polyfluoroalkyl substances (PFAS) to impart wrinkle resistance to the fabric. Formaldehyde is a volatile organic compound that contributes to ground-level ozone formation and photochemical smog. It is also a known carcinogen and skin irritant that exacerbates respiratory problems. PFAS is known as ‘forever chemicals,’ as they are resistant to degradation and extremely persistent in the environment. These substances can travel through the air and return to the surface via precipitation, spreading globally even to remote areas like Antarctica. Exposure to PFAS causes immune system disruption, hormone interference, reproductive harm, and increased cancer risk.³⁰

Socio-Economic Impacts

The fashion industry not only has severe environmental impacts but also drives significant social issues. With manufacturing largely outsourced from the Global North to the Global South, most pollution and resource extraction occur in the latter, while the financial benefits are concentrated among brands and consumers in the former. Garment workers in countries like Bangladesh, Vietnam, and Cambodia are often exposed to hazardous chemicals and unsafe working conditions.³¹ Yet, most receive poor compensation with low wages, despite being crucial to the fashion supply chain.³¹

Those not only working in but living near textile factories, dyeing facilities, landfills, and incinerators bear a disproportionate share of the fashion industry's environmental burden. They often face polluted air and water, high rates of illness, and lack the political influence to demand cleanups or compensation. In countries that import large amounts of secondhand clothing from the Global North, inadequate waste management infrastructure frequently leads to blocked waterways, uncontrolled fires, and environmental damage.³²



Figure 8: People Try to Salvage Items from the Burned-down Secondhand Clothing Market at Kantamanto | Nipah Dennis/AFP

These problems affect the most vulnerable populations, consisting of low-income communities, women, and children. The fashion supply chain mirrors and reinforces broader patterns of global inequality. Addressing the industry's environmental impact must therefore also confront the unequal distribution of its effects, identifying who bears the greatest burden of pollution and climate change, and the exclusion of these communities from decisions about how the industry should evolve.

CASE STUDY

CITARUM RIVER POLLUTION: ENVIRONMENTAL JUSTICE IN INDONESIA'S TEXTILE SUPPLY CHAIN

The Citarum River is the longest river in Indonesia, flowing 190 miles into the Java Sea. Until the 1970s, it supported rich aquatic life and was safe for agriculture and human use.³³ Its condition began to decline with the growth of manufacturing industries, especially textiles, and has continued to worsen since then.

The river basin comprises around 2000 industries, textiles being the most dominant, contributing to 68% of the river's pollution.^{34 35} Together, these industries discharge 20,000 tons of solid waste, 340,000 tons of wastewater, and 200 tons of toxins into the river every day.³⁶ The river is laden with heavy metals such as zinc, cadmium, chromium, and manganese that meet the maximum threshold levels. The excessive nutrient load from the wastes causes eutrophication, algal blooms, depletion of dissolved oxygen, and ultimately, a decline in biodiversity.^{37 38} The organic solvents and starches used in sizing and finishing processes in textiles contribute to the organic load in the river.³⁹ The dyes used in textile dyeing contain hazardous substances, like nonylphenol, which are highly toxic to aquatic organisms. Eutrophication has caused the river's aquatic biodiversity to decline by 60% since 2008.

The environmental issues described above have caused significant environmental injustice to the communities living and working near the river. Roughly 25 million people are dependent on the river for drinking water and livelihood.⁴⁰ In April 2016, Greenpeace and Padjadjaran University's Institute of Ecology reported that industrial wastewater discharge contaminated 2,300 acres of rice fields with heavy metals, resulting in economic losses of \$866 million over 20 years.³³

Those living closest to the river bear the greatest burden, as they are exposed to pollution from factories producing goods for consumers around the world. In 2011, Greenpeace conducted a study on PT Gistex, a textile company in Bandung that produces synthetic polyester fabric.²⁵ The wastewater from PT Gistex contained such high levels of harmful chemicals like nonylphenol and nonylphenol ethoxylates, tributyl phosphate, antimony, and highly alkaline wastewater that it indicated virtually no processing of effluents before discharge into Citarum.

Several global fashion brands, including Gap Inc., Adidas, Brooks Brothers, and H&M, sourced either directly or indirectly from PT Gistex. The NY Fashion Environment Accountability Bill of 2025, when enacted, will ensure supply chain mapping, regulate pollution mainly by Tier 2 suppliers, and ensure responsible sourcing.

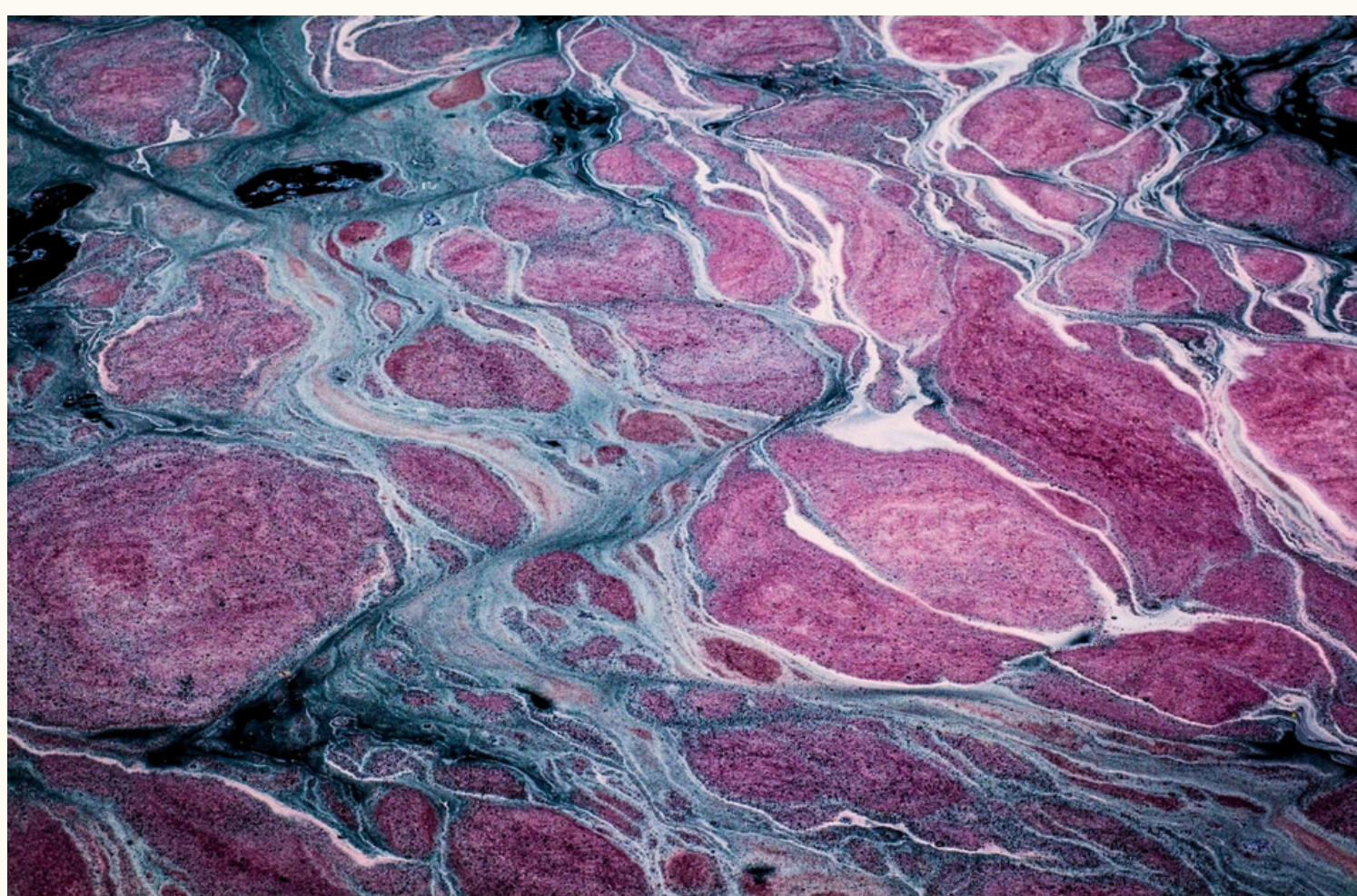


Figure 9: Pink-grey Dye Foam on Citarum River, Java, Indonesia
Korb and Switzer, 2023



Figure 10: Pink-grey Dye Foam on Citarum River, Java, Indonesia
GettyImages 2018

POLICY MECHANISMS OF THE BILL

ESSENTIAL MANDATES UNDER NY FASHION LAW A4631-B

The Fashion Environmental Accountability Act would cover fashion sellers, including apparel, footwear, and fashion bag sellers, in New York State with an annual revenue exceeding \$100 million. It would exempt companies dealing exclusively in second-hand goods, as well as multi-brand retailers, unless an individual label within their portfolio generates more than \$100 million globally. The bill would also cover retail platforms that primarily facilitate third-party sales, provided at least 50% of their total sales come from apparel, footwear, or fashion bags.

Key Requirements of the Fashion Environmental Accountability Act		
Requirement	Description	
 Supply Chain Mapping	Companies must map full supply chains, including environmental and labor conditions.	
 Due Diligence	Identify, prevent, and remedy environmental and human rights harms throughout operations.	
 GHG Reduction Targets	Set and pursue science-based targets to reduce greenhouse gas emissions.	
 Resource & Pollution Management	Monitor and manage chemical use, water consumption, and wastewater discharge.	
 Public Disclosure	Regularly publish environmental performance data to ensure transparency.	
 Non-Compliance	Companies may face fines of up to \$15,000 per violation per day.	

Figure 11: Compliance Checklist for Bill Covered Fashion Sellers



Figure 12: Canva

Due Diligence as a Mechanism for Change

The bill utilises due diligence to make the industry more sustainable by enhancing compliance and transparency. It requires companies that are covered by the bill to conduct comprehensive due diligence processes, involving identifying risks and implementing steps to mitigate those risks while adhering to established guidelines. Companies must submit a due diligence report to the Department of State annually, starting eighteen months after the effective date of the legislation.⁷ They must also publicize these reports on their websites.

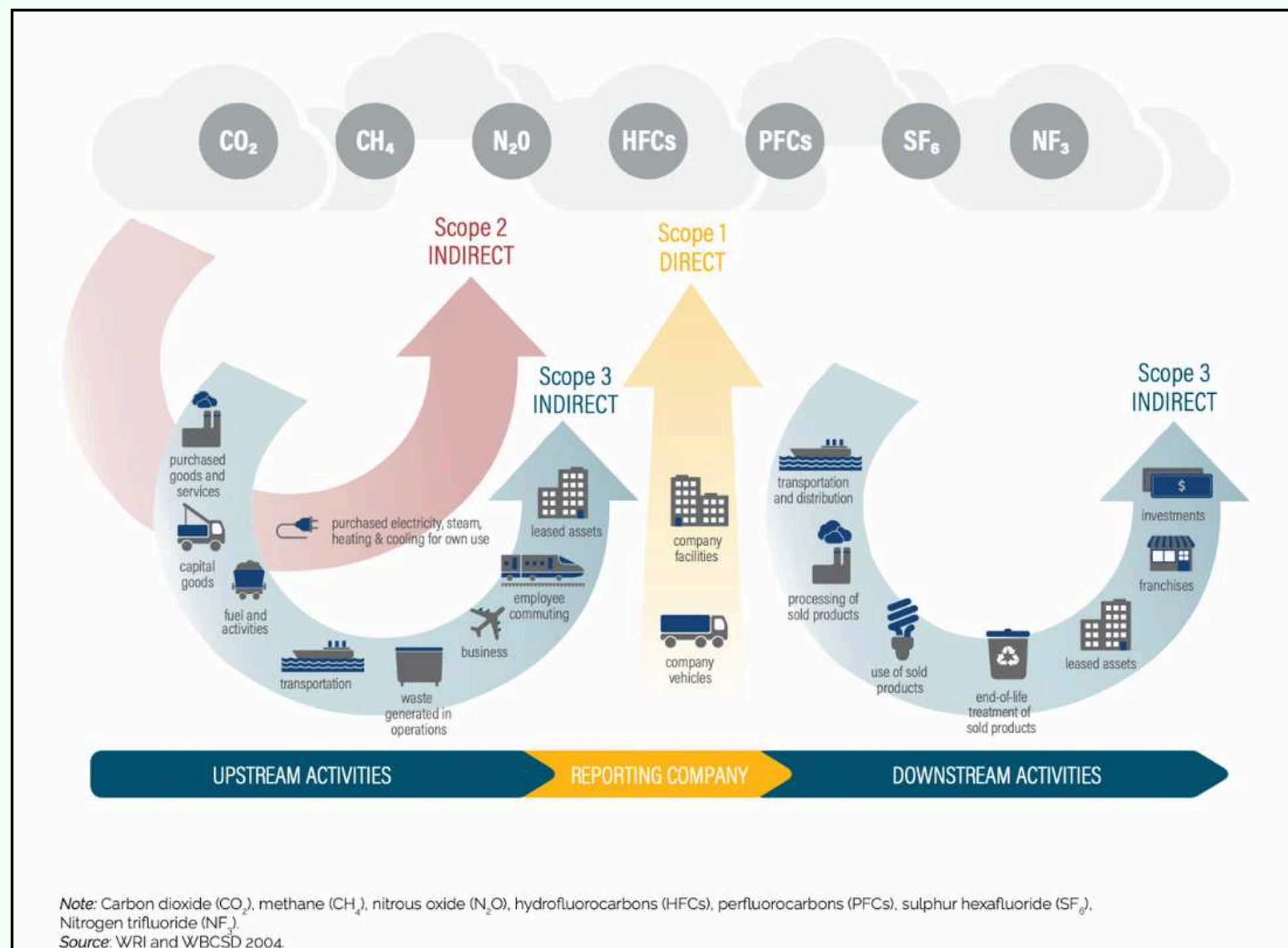


Figure 13: Overview of Scopes and Emissions Across a Value Chain, Apparel and Footwear Sector Science-Based Targets Guidance

OECD Guidelines on Due Diligence

Under the bill, qualifying companies in the garment and footwear sector are required to adhere to the Organization for Economic Co-operation and Development (OECD) Due Diligence guidelines for multinational enterprises and responsible supply chains into their policies and management systems.⁴¹ The guidelines include risk identification in supply chains, risk prevention and mitigation, stakeholder engagement, and tracking and reporting mechanisms.



Figure 14: OECD Logo

RISK IDENTIFICATION AND MITIGATION

As part of the risk identification and mitigation component of the bill, it requires fashion sellers to establish a quantitative baseline and annually report their greenhouse gas inventory starting in 2027. Fashion sellers should sample and report wastewater chemical concentrations and water usage, providing evidence that their suppliers are complying with local chemical management laws. Following these reported metrics, the bill mandates that companies should mitigate risks by incentivizing improved supplier performance through the following methods:

Responsible Purchasing - Companies must embed responsible purchasing practices in their supply chain relationships. This could promote more accountable decision-making along supply chains. One example of how a company could practice responsible purchasing is by choosing to purchase from suppliers certified by the Global Organic Textile Standard (GOTS).

Greenhouse Gas (GHG) Reduction - Factories and other facilities in the fashion supply chain contribute to air pollution and greenhouse gas emissions. Under the bill, fashion sellers would be required to establish a quantitative baseline, take measures to reduce their emissions, and begin annually reporting their greenhouse gas inventories in 2027. To ensure transparency, the bill also mandates independent verification of these reports.

Chemical Waste Management - Textile production often involves dyeing and applying specific chemicals to achieve a desired texture or quality. These processes are typically water-intensive and can lead to pollution of soil and water bodies. The bill would require fashion sellers to sample and report wastewater chemical concentrations and water usage, and provide evidence that suppliers are complying with local chemical management laws.

Exit and Disengagement - The bill requires responsible exit and disengagement strategies. Companies could do this by establishing necessary policies and communicating transparently.

Stakeholders and Rights Holders Consultation and Engagement - The bill mandates consultation with directly or potentially affected stakeholders, along with their designated representatives.

Cooperation in Remediation - The bill requires companies to cooperate in remediation in the event of an adverse impact. This process may include remedies such as restitution, financial compensation, or non-financial compensation for victims.



Figure 15: Activated-sludge Aeration Tank Treating Textile Effluent

Supply Chain Mapping Requirements

The bill requires companies to disclose their suppliers from tier one to tier four with specific timeframes that companies are to abide by, as outlined below:⁷

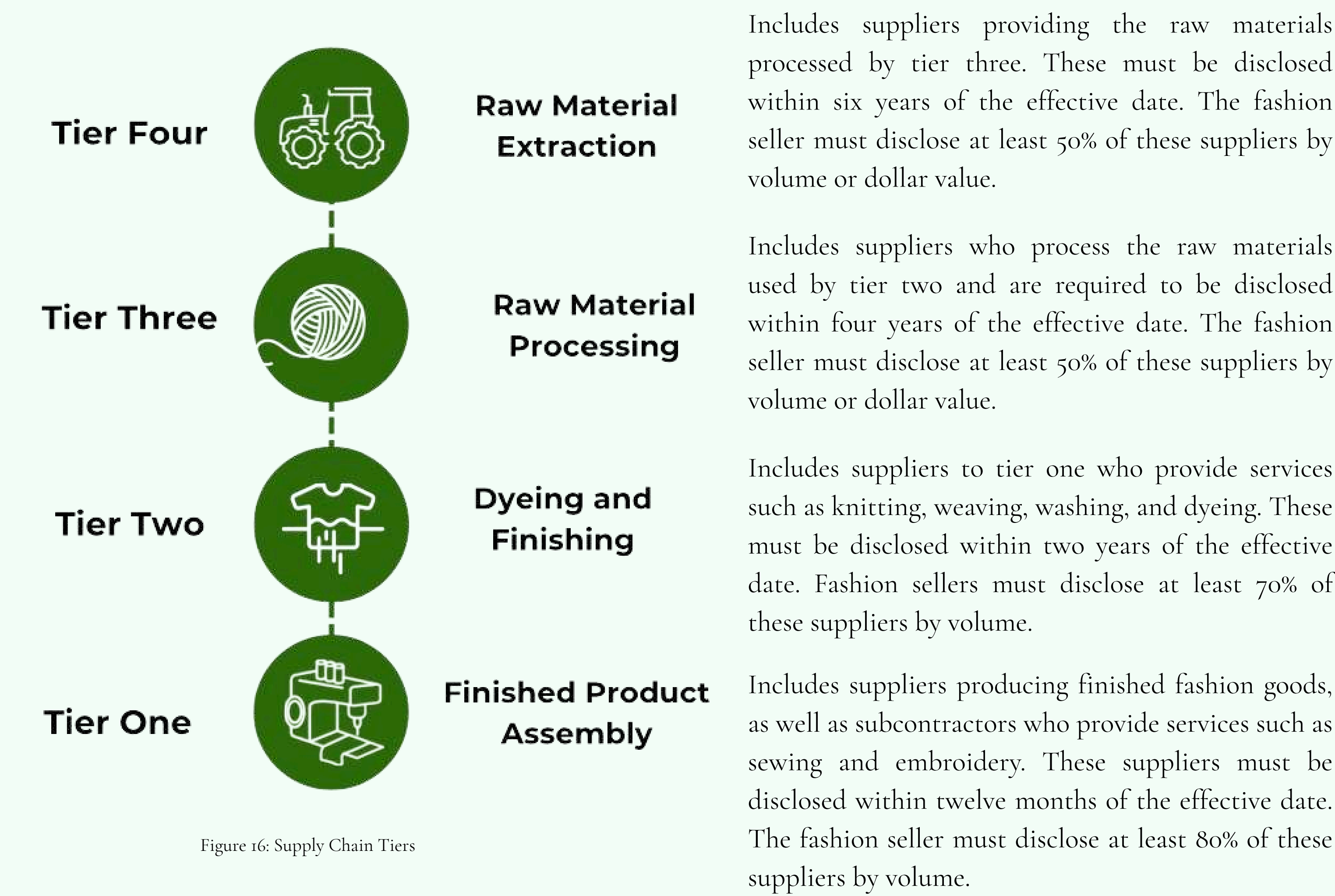


Figure 16: Supply Chain Tiers

Carbon Accounting and GHG Reporting

Under the bill, companies are mandated to disclose their greenhouse gas emissions on a yearly basis. The greenhouse gas inventories must include absolute emissions figures from the company’s Scope 1-3 emissions.

New York State Bill 4631-B does not specify greenhouse-gas reduction targets; instead, it requires fashion brands to, at a minimum, follow the Science-Based Targets initiative (SBTi) Net-Zero Standard—the only global corporate framework for net-zero target setting aligned with the Paris Climate Accord.⁴² This standard provides the guidance, criteria, and recommendations brands need to align their emissions-reduction targets with limiting global temperature rise to 1.5°C.

The bill mandates the SBTi Net-Zero Standard because of its continuous updates and alignment with major frameworks from the World Resources Institute, CDP, the United Nations Global Compact, and the World Wildlife Fund.

FASHIONING ACCOUNTABILITY: LEGAL AND SCIENTIFIC FRAMEWORKS FOR EMISSIONS REDUCTION IN NEW YORK



Figure 17: Steps Companies Need to Take to Set and Commit to GHG Science-Based Target (STBi)

Setting corporate carbon-reduction targets through SBTi involves several steps.⁴² First, the company makes a public commitment by signing the SBTi's Net-Zero Commitment Letter, signaling to shareholders, clients, partners, customers, and regulators that it will set and meet science-based net-zero goals. Next, it sets reduction targets using Criteria Assessment Indicators (CAIs) and sector-specific guidance, with both short-term and long-term goals; Bill 4631-B's tiered disclosure requirement mirrors this gradual decarbonization strategy. The company then submits its draft targets and supporting documentation via SBTi's online validation system; the SBTi team either approves them or provides feedback for revision. Finally, once validated, the company integrates these targets into its strategy and operations and publishes an annual Corporate Sustainability Report (CSR) to update stakeholders on year-over-year progress toward net zero. The bill requires an emissions inventory to be reported to the Department of State beginning in 2027, with each report covering the previous fiscal year.⁷

Additionally, the bill increases requirements for companies with revenues over \$100 billion. Such companies are required to use the absolute contraction approach to calculate their Scope 3 emissions and set their Science-Based Targets. Through this stipulation, disclosed emissions figures and emissions targets are not normalized into per unit of production or per unit of revenue and are instead set in absolute figures, ensuring the companies keep up with global climate mitigation frameworks.

The reporting standards mandated by the bill are the latest editions of the GHG Protocol's Corporate Accounting and Reporting Standard,⁴³ its Scope 2 Guidance, and, as of 2028, the Corporate Value Chain (Scope 3) Accounting and Reporting Standard from the World Resources Institute and the World Business Council for Sustainable Development.⁴⁴ Under these frameworks, companies must quantify their annual emissions and secure independent, third-party verification of their emissions inventory every two years. The success of this mandate put forward by the bill can be measured through reporting coverage, year-to-year emissions reductions, percentage of brands with SBTi-validated science-based targets, and third-party verification compliance.

Under the bill, the attorney general or related party will be responsible for monitoring, investigating, and enforcing the due diligence requirement. It will do so by bringing civil actions to obtain injunctions and imposing fines on any fashion brand operating in New York State with annual revenues exceeding \$100 million that fails to comply. Such fines will go into the Fashion Remediation Fund established by the bill.

Fashion Remediation Fund

The Fashion Environmental Accountability Act establishes the Fashion Remediation Fund, a special state fund designed to address and repair environmental harm caused by non-compliant fashion sellers. The fund will be jointly managed by the New York State Comptroller, the Commissioner of Taxation and Finance, and the Commissioner of Environmental Conservation.

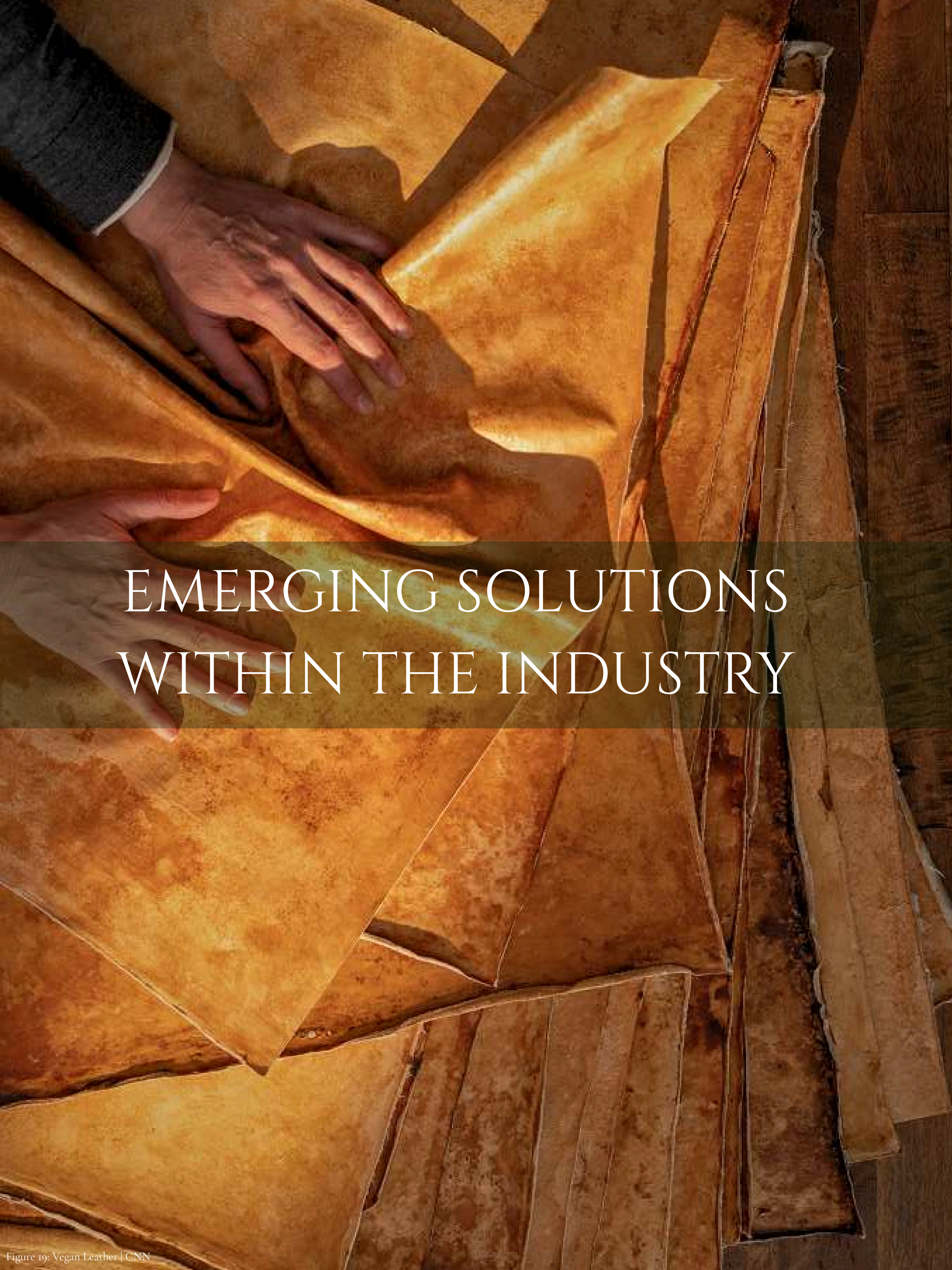
Money for the fund will come primarily from civil penalties, up to \$15,000 per day per violation, levied against fashion sellers who fail to meet the Act's due diligence, reporting, or environmental compliance requirements. Once collected, these funds must be used for environmental benefit or remediation projects that directly and verifiably assist the workers and communities most impacted, ideally at or near the location where the harm occurred.

The Act requires the Department of State to identify fashion sellers that fail to comply with their obligations. Such companies must be notified and given 30 days to correct their violations. If they fail to do so, they may be placed on a public non-compliance list and referred to the Attorney General for enforcement. The Attorney General or a designated administrator can bring civil proceedings and impose penalties.

The Act also emphasizes stakeholder engagement: companies should initiate consultation with those directly or potentially affected by the harm. Remedies can include not only environmental restoration but also financial or non-financial compensation, community outreach, educational programs, and procedural changes to prevent future harm.



Figure 18: Supported Local Clean-up Day in Lower East Side, New York



EMERGING SOLUTIONS WITHIN THE INDUSTRY

Emission Reduction Technologies

To reduce the climate impact of production processes, most significantly Scope 3 emissions, clothing brands are looking to alternative production techniques, sources of materials, and methods of producing raw materials.

Alternative materials like mushroom leather and recycled ocean plastics offer fashion brands promising pathways to reduce their carbon footprint. Mushroom leather, derived from mycelium, requires significantly less water and land than conventional leather, while recycled ocean plastics transform marine waste into durable textiles.^{45 46}

In addition to alternative materials, the use of recycled materials significantly reduces carbon emissions by avoiding the energy-intensive extraction and processing associated with new materials. When polyester is produced from recycled ocean plastics rather than petroleum feedstock, it eliminates oil extraction, refining, and polymerization processes, while recycled leather made from post-consumer waste bypasses the resource-intensive cattle farming and chemical tanning processes that contribute heavily to methane and carbon dioxide emissions. Companies may also reduce their footprint through the selection of resources like regenerative cotton and flax, which create a net carbon sink by rebuilding soil organic matter through practices such as cover cropping, reduced tillage, and crop rotation, which sequester atmospheric carbon dioxide in soil biomass.^{47 48 49}

These methods can help restore soil health and microbial diversity, increasing the soil's capacity to store carbon while simultaneously reducing the need for synthetic fertilizers and pesticides that require fossil fuel-intensive production processes.



Figure 20: Mushroom-leather Handbag

Water Quality Testing

The fashion industry processes rely on processes that generate significant water pollution.⁵⁰

Leather tanning highlights the industry's water quality challenges, requiring several hazardous chemicals and practices like chromium salts, sodium sulfide, and hide soaking. Chromium salts act as a preservative in the leather production process, preventing biological degradation as well as enhancing hide flexibility, heat resistance, and water resistance. These salts pose severe risks to aquatic ecosystems and human health. Chromium exposure reduces fertility and suppresses immune function in fish, accumulating in their tissues, which can impact human consumers.⁵¹

Sodium sulfides used for removing hair and stripping hides of fat and tissue in the leather manufacturing process can contaminate water systems, forming hydrogen sulfide, which is also toxic to fish. In leather tannery workers, sodium sulfide exposure leads to irritation of the eyes, throat, and lungs, with chronic exposure leading to respiratory diseases.⁵² Both of these chemicals, as well as large quantities of organic matter, reach water systems through the processes of hide soaking and the subsequent dumping of wastewater.

Testing and Treatment Technologies

International methodologies for quantifying wastewater pollutants and reducing toxicity are well-established, but their implementation is often hindered by the high costs of equipment and the specialized training needed for proper operation and interpretation of results. These difficulties only increase further downstream in the supply chain. Yet, if provided proper monetary and informational support, measures can be taken to significantly reduce the adverse ecological effects of wastewater generation in the fashion industry.

CASE STUDY: COACHTOPIA

A SCIENCE-BASED APPROACH TO CIRCULARITY

Coachtopia, introduced by Coach in 2023, was designed as a “circular innovation lab” to reimagine luxury fashion’s materials and production systems. The brand’s products use at least 50% recycled leather fibers sourced from post-industrial and post-consumer waste.⁵³

Gen Phoenix’s recycled leather is created by mechanically breaking down waste leather into fibers, then re-bonding them into sheets using hydroentanglement which is a high-pressure water jet process that avoids chemical adhesives.⁵⁴ This innovation reduces the product’s carbon footprint by up to 80% and diverts significant waste from landfills.



Figure 21: Coachtopia Circularity



Figure 22: Gen Phoenix Non-woven Leather Fabric

Alignment with the NY Fashion Environmental Accountability Act

Coachtopia’s practices align with the New York Fashion Environmental Accountability Act by addressing key sustainability goals. Reducing the reliance on livestock-based leather lowers upstream greenhouse gas emissions, contributing to Scope 3 emissions reduction. Tier 2 chemical management eliminates toxic tanning agents, decreasing water pollution, while enhanced supply chain transparency discloses supplier partnerships and material sources, fostering greater accountability and environmental responsibility throughout the production process.

Tapestry, Coach’s parent company, has deepened its commitment by investing \$15 million in Gen Phoenix, raising its ownership stake to 9.9% and securing a multi-year supply agreement, demonstrating scalability and market viability.⁵³



Figure 22: Coachtopia Logo



SCIENTIFIC ISSUES AND CONTROVERSIES

Many solutions have emerged over the years to address the fashion industry's environmental impact. However, most of them remain contested regarding the scientific evidence supporting the sustainability of these solutions. These controversies typically fall within two key categories: The materials used in production and the processes involved throughout the fashion industry's value chain.

Debates and Controversies with Materials

Fiber and materials used in production present some of the most difficult challenges in the fashion industry. Getting common fibers such as cotton, linen, wool, or leather can come at a high cost to the environment. Producing 1 kg of wool can cause about 80.3 kg of carbon dioxide while using up 800 liters of water.⁵⁵ One response to the environmental problems posed by material production that certain companies within the fashion industry have taken is to utilize alternative materials that could have a lower negative impact. One such alternative material is vegan leather, which emerged around 2010 and has continued to capture the attention of conscious consumers and popular brands, like Hermès, that are seeking to be more sustainable.⁵⁶



Figure 24: Peeling Vegan Leather Tote Bag | StockImages

Vegan leather presents an exciting opportunity for brands to move away from animal leather and towards synthetic or plant-based sources. However, vegan leather often requires petroleum-derived synthetics, such as polyurethane (PU) and polyvinyl chloride (PVC).⁵⁷ While PU and PVC-based vegan leathers reduce some environmental impacts associated with animal agriculture, they introduce concerns regarding microplastic shedding, environmental persistence, and toxicological risks from chemical additives.⁵⁷

Scientific studies have shown that vegan leather is non-biodegradable, releases microplastics during use, and often contains harmful plasticizers and solvents in its manufacturing process, raising concerns about occupational exposure and environmental accumulation. Furthermore, many of these materials have a lower longevity than traditional leather, which can potentially lead to increased waste. Some argue that an animal leather bag, which could last for 20 years, may have a lower environmental impact than a vegan leather bag that would need to be replaced more frequently.⁵⁸

While there is a lot of uncertainty about the environmental impact of generating alternative materials such as vegan leather, another option that has emerged in the fashion industry is the use of recycled materials. Recycled polyester (rPET), typically made by melting down discarded plastic bottles and spinning them into fibers for fabric production, is one commonly used recycled material.⁴⁶ rPET is perceived as a greener alternative to producing virgin polyester. However, scientists and environmental advocates have increasingly questioned its sustainability. Firstly, the transformation of bottles into garments disrupts closed-loop recycling systems in the beverage industry, where bottles can be recycled repeatedly.⁵⁹ Additionally, both virgin and recycled polyester fabrics are major contributors to microplastic pollution. Despite its lower energy footprint compared to virgin polyester, rPET still also relies on fossil fuel-derived feedstock and fails to address the root problems of overproduction and synthetic fiber dependence in the industry.

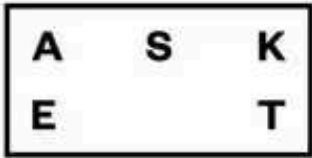
Recycling and End-of-Life Challenges

Textile recycling is a core component of sustainability strategies in the fashion industry, yet it remains limited in scope and scientific consensus. While recycled materials like rPET are commonly used, broader recycling systems in fashion face serious technical and environmental challenges. Most post-consumer garments are difficult to recycle due to the prevalence of blended fabrics (e.g., cotton-polyester blend), which are not easily separable using current technology.⁵⁹ This complicates both mechanical and chemical recycling efforts. Even when mechanical recycling is possible, it often degrades fiber quality, limiting reuse. Chemical recycling, though more versatile, is energy-intensive, expensive, and still in the developmental stage.⁶⁰

The extent to which the various controversies in the fashion industry can be overcome is uncertain. Legislation such as the Fashion Environmental Accountability Act presents opportunities for more conversations and input from various stakeholders. While some industry groups have pushed back on regulation, understanding the underlying challenges and establishing clear metrics to measure impacts could lead to significant progress in making fashion more sustainable.⁶¹



Figure 25: People searching for used clothes in the Atacama Desert, Chile | Martin Bernetti/AFP



The Impact Receipt

ORDER: 001

THE T-SHIRT

RAW MATERIALS

Impact (CO ₂)	0,29 kg
Water	33,27 m ³
Energy	12,41 mJ

MILLING

Impact (CO ₂)	1,12 kg
Water	0,50 m ³
Energy	20,00 mJ

MANUFACTURING

Impact (CO ₂)	0,24 kg
Water	1,30 m ³
Energy	5,40 mJ

TRIMS

Impact (CO ₂)	0,13 kg
Water	0,03 m ³
Energy	5,14 mJ

TRANSPORT

Impact (CO ₂)	0,11 kg
Water	0,00 m ³
Energy	1,20 mJ

TRUE COST

Impact (CO ₂)	1,89 kg
Water	35,10 m ³
Energy	44,1 mJ

180 WEARS

MIN. EXPECTED LIFETIME

0,19 EUR
COST PER WEAR

0,01KG
CO2 PER USE

0,20 m³
WATER PER WEAR

0,25 mJ
ENERGY PER USE

KNOW YOUR IMPACT, BUY LESS,
KEEP IT LONGER

I'VE READ AND UNDERSTOOD THE
IMPACT OF MY CHOIC:

ASKET.COM

SUCCESS STORIES

Figure 26: The Impact Receipt | ASKET

CASE STUDY: ROTHY'S



Figure 27: "Ravello" Loafers



Figure 28: Lightweight Tote



Figure 29: Rothy's SoHo Flagship Store

Rothy's, an American direct-to-consumer company that designs and sells high-quality luxury goods, shows how its commitment to the planet manifests in its products. The company has recycled over 715,000 pounds of marine plastic from the ocean and uses the plastic in its products.⁶² Rothy's Lightweight Tote is knit with a combination of two key items: thread from marine plastic, which has been collected within 30 miles of water. This tote also uses the company's signature thread, which is spun from plastic bottles. Each tote bag is made with approximately 618 grams of ocean-bound marine plastic.⁶³

Rothy's best-selling men's shoe, "The Ravello loafer," is made with about 16 plastic bottles each.⁶⁴

In 2023, Rothy's achieved a True Platinum certification, the highest level in the TRUE Zero Waste certification program administered by Green Business Certification Inc., for its sustainability efforts.⁶⁵

CASE STUDY: PATAGONIA



Figure 30: Patagonia Logo



Figure 31: Worn Wear Mobile Repair Truck

Patagonia, which specializes in outdoor apparel, is recognized as a global leader in sustainability. The company implements several measures to reduce its environmental footprint and releases accessible public reports on its work to maintain a transparent supply chain. Patagonia implements due diligence in its supply chain by screening the factories it sources from, looking at key factors such as labor practices and environmental and social responsibility. The company also collaborates with third-party groups to verify its practices, including working with Fair Trade USA to certify its factories.⁶⁶

Notably, Patagonia has set a goal to reach net zero across its value chain by 2040, with a key metric of reducing Scopes 1, 2, and 3 emissions by 90%.⁶⁷ The company has collaborated with the Science Based Targets initiative to validate its emissions target, a practice encouraged by the bill. Patagonia also integrates recycled and organic materials, including regenerative organic cotton and recycled polyester, into its products. Its Worn Wear program promotes product longevity by encouraging repair, reuse, and recycling. Additionally, Patagonia allocates 1% of sales to environmental causes and publicly reports its progress through annual sustainability reports.⁶⁸

CASE STUDY: PRADA

Prada’s 2019 Impact Report offers a real-world example of what compliance with New York State’s Fashion Environmental Accountability Act could look like in practice.⁶⁹In this report, Prada systematically maps its supply chain from Tier 1 to Tier 4, fulfilling the bill’s emphasis on transparency across the full value chain. The report further quantifies environmental performance by detailing emissions from Scopes 1, 2 and 3. This aligns directly with the bill’s demand for comprehensive greenhouse gas accounting, which is critical for developing targeted mitigation strategies.

Beyond emissions reporting, Prada’s disclosure of waste generation and resource use illustrates how detailed value chain analysis can identify “hot spots” where environmental impacts are most concentrated. For example, identifying high-emission processes in textile production or waste-intensive stages in garment assembly allows for targeted interventions such as adopting low-impact materials, improving manufacturing efficiency, or implementing take-back and recycling programs. The bill requires that such findings be paired with actionable plans, which Prada addresses by outlining specific emissions reduction goals and the steps it will take to achieve them.

Crucially, the bill also requires companies to identify and address actual or potential risks to human and environmental health. Prada’s 2019 Impact Report acknowledges these risks and incorporates supplier engagement, responsible sourcing policies, and investment in sustainable materials to mitigate them. In doing so, Prada not only meets the proposed legislative requirements but also sets an example for peer companies by demonstrating that detailed environmental accountability can be embedded into corporate strategy without compromising brand identity.

Prada’s 2019 Impact Report functions as a blueprint for compliance with A4631-B, illustrating that with transparent supply chain mapping, robust environmental metrics, and actionable reduction strategies, the fashion industry can move toward measurable and enforceable sustainability. The alignment between Prada’s voluntary disclosures and the bill’s mandates underscores both the feasibility and necessity of legislating environmental accountability in fashion.

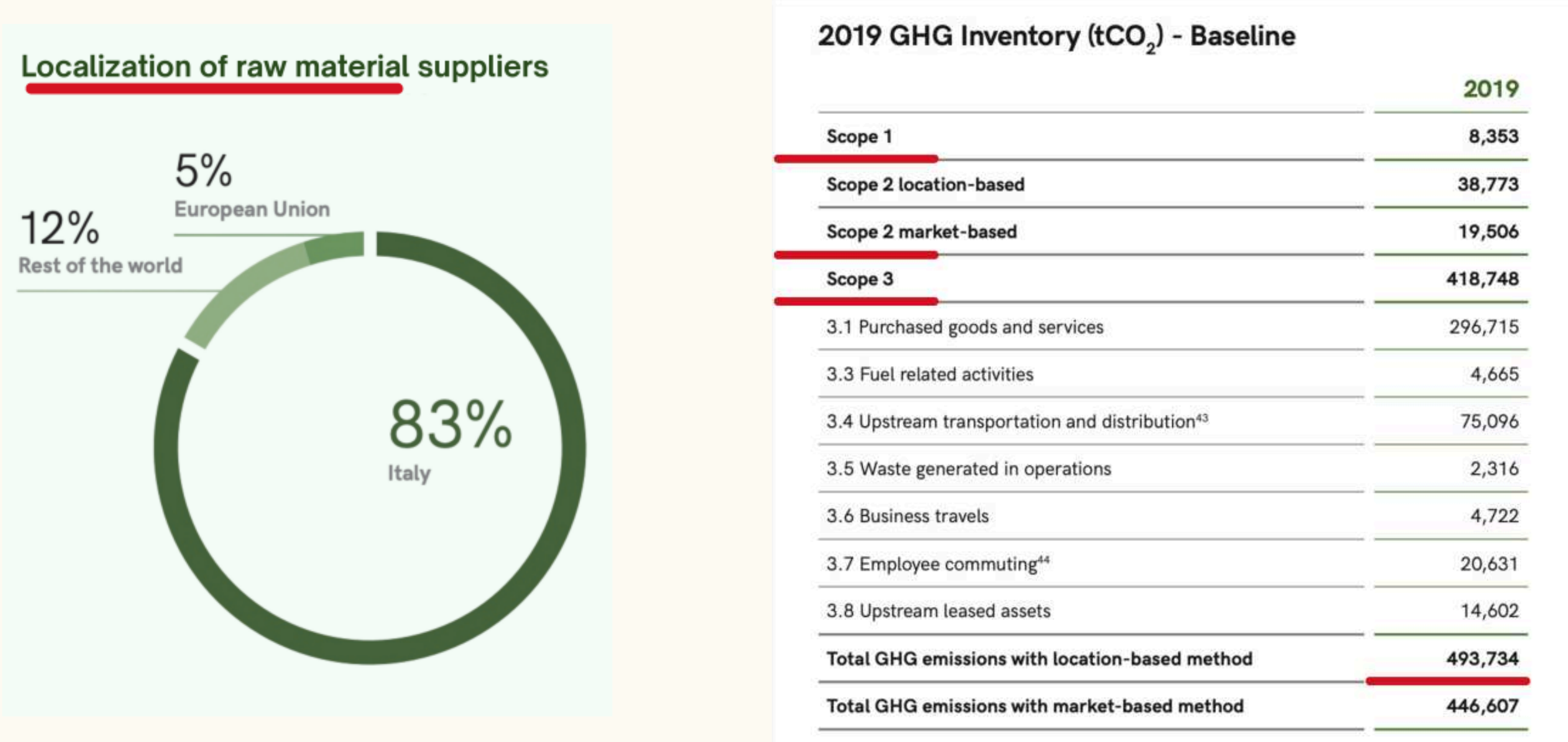


Figure 32 and 33: Prada 2019 Impact Report



Figure 34: Prada Logo

CONCLUSION

The fashion industry is a major contributor to greenhouse gas emissions, water and chemical pollution, and waste generation, making its environmental footprint one of the largest among global sectors. As a major hub for thousands of fashion brands, New York is uniquely positioned to influence this industry's trajectory. The New York State Assembly A4631-B: The Fashion Environmental Accountability Act serves as a critical mechanism to regulate and reduce these impacts through greater transparency, accountability, and measurable reductions.

Multiple solutions have emerged to address the industry's environmental challenges, such as the use of alternative materials (e.g., recycled polyester, vegan leather) and improved processes (e.g., eco-friendly dyes, advanced wastewater treatment). However, these approaches are not silver bullet solutions. Recycled polyester continues to shed microplastics. Vegan leather often relies on non-biodegradable plastics. Natural dyes raise concerns about scalability and chemical additives. These complexities highlight the need for careful evaluation of benefits versus trade-offs, supported by robust metrics to determine which options are truly more sustainable.

The Fashion Environmental Accountability Act addresses these complexities by requiring due diligence and supply chain disclosure while integrating scientific methods for monitoring impacts and remediation. The inclusion of a Fashion Remediation Fund further ensures that communities harmed by pollution are supported. Yet, challenges remain: risks of greenwashing, enforcement difficulties, and compliance costs could limit effectiveness if not managed carefully.

The bill's success will ultimately depend on strong oversight, continuous scientific research to refine solutions, and collaboration across stakeholders. If implemented effectively, New York can set a global standard, demonstrating how fashion can shift away from its historically environmentally degrading practices toward an industry that is innovative, responsible, and environmentally sustainable.



Figure 35: Canva

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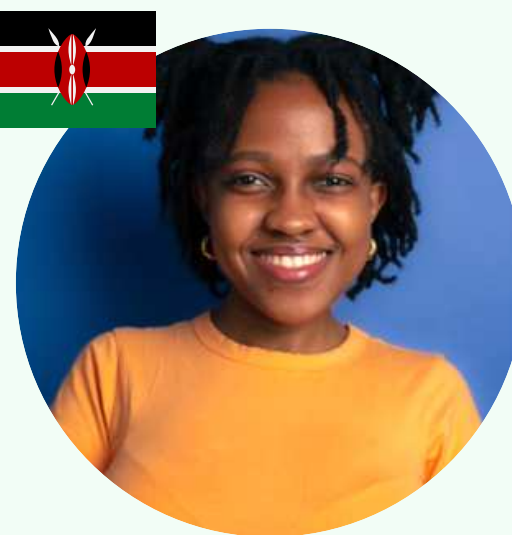
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