



Working with Nature to Drive
Meaningful Change in Stretch Textiles

Lingerie brands face a major challenge in replacing elastane, a petroleum-based material that is posing a significant environmental and social threat, while struggling with achieving the right stretch, fit, and waste management systems.

The Global Problem: Elastane's Environmental & Social Impact

- **Energy Intensive & Carbon Footprint:** Elastane production is highly energy-intensive (380MJ/kg) and contributes significantly to global warming emitting about 17 kg CO₂ per kg, surpassing other highly polluting materials like polyester and acrylic (Vogtländer, J. 2014).
- **Toxic Chemicals:** The production process involves harmful chemicals, putting workers' health at risk (McDaniel, 2024) and polluting surrounding areas.
- **Microplastic Pollution:** Elastane sheds particles during washing, polluting water systems, soil, and entering food chains, negatively affecting human health and biodiversity (even with a 2% content in a textile blend) (Rathinamoorthy, R. et al, 2023).



THE WASTE CRISIS IN LINGERIE

By its very nature, underwear cannot be reused or purchased second-hand, leading to inevitable waste



- **Landfill Persistence:** 5 million kilograms of underwear are sent to landfill each day in the U.S. alone (Fleming, 2021). Textiles containing elastane remain in landfills for centuries, creating long-term environmental damage with microplastics entering the water systems and food chain, endangering health and biodiversity.
- **Recycling Barriers:** Elastane's low melting point complicates mechanical recycling, making it costly and inefficient (Ribul, 2021).
- **Social Impact:** Global waste accumulation exacerbates pollution in regions without adequate waste management infrastructure.

GLOBAL MARKETS

Fire Devastates Ghana's Kantamanto Used Clothing Market

The blaze late Wednesday dealt a huge blow to the secondhand trading hub, displacing thousands of traders.



People try to salvage items from the burned out ruins of Ghana's Kantamanto used clothing market. (Nipah Dennis/AFP via Getty Images)

By **SARAH KENT**

03 January 2025

SUSTAINABILITY

What the Kantamanto Market fire means for sustainable fashion

A fire at West Africa's largest secondhand clothing market leaves thousands of retailers displaced and shops destroyed, while textile waste handling hangs in the balance.

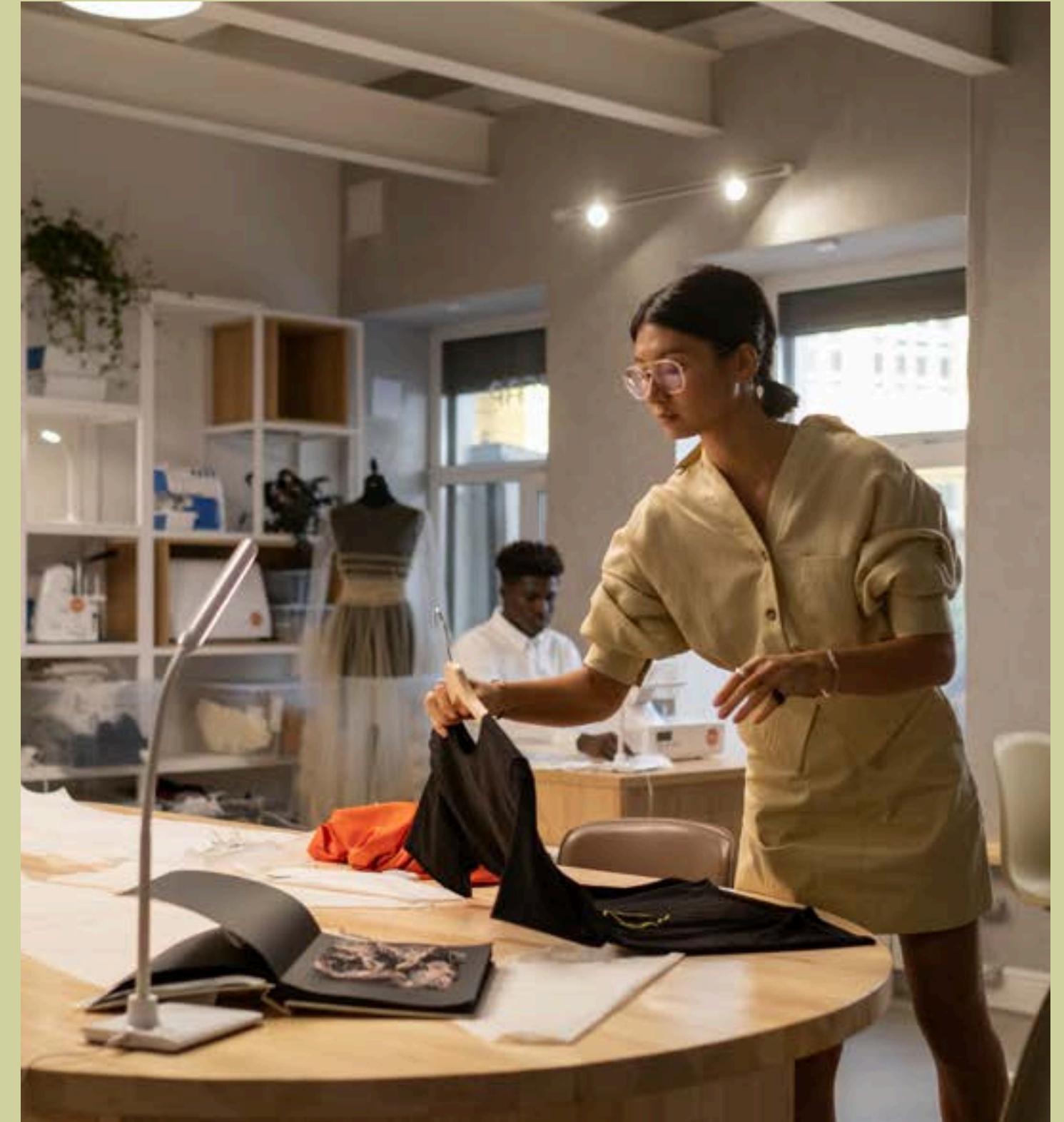
BY BELLA WEBB

January 3, 2025



CHALLENGES FACED BY LINGERIE BRANDS

- **Consumer Demand for Performance and Sustainability:** Alternatives like organic cotton don't meet consumer expectations for fit, shape, and durability, forcing brands to compromise.
- **Costly Waste Management:** Brands prioritizing sustainable end-of-life solutions face high disposal costs, whether through recycling or incineration, adding financial strain.
- **Design Limitations:** Design teams are constrained by existing machinery and performance standards, limiting their ability to innovate with truly sustainable materials.
- **Emerging Regulations:** New regulatory pressures, such as the EU Extended Producer Responsibility (EPR) and Ecodesign for Sustainable Products Regulation (ESPR), require brands to take responsibility for their products' lifecycle, introducing compliance costs.



The Urgency of Change



Ineffectiveness of Current Solutions

To improve recyclability, existing alternatives like chemical fiber separation use harmful solvents that add to environmental and social harm, without offering truly sustainable outcomes.

Brands' Demand for Innovation

Major brands and manufacturers are actively seeking solutions, but many current alternatives fail to meet performance standards or long-term sustainability goals. While initiatives like **Under Armour's Neolast Fibre** and **Adidas' Twistknit** are promising, they remain tied to fossil fuel derivatives and fall short of driving systemic change.



New Elastane-Free Product Lines of Big Brands Nothing but Smokescreen

The recent launches of so-called anti-elastane product lines by big brands do not mean much while they continue to gorge on fossil fuel derivatives. None of the new ranges replace existing product lines. [textfash.com](#) probes.

By [SPECIAL CORRESPONDENT](#) 13 May 2024 4 minutes

Our Solution

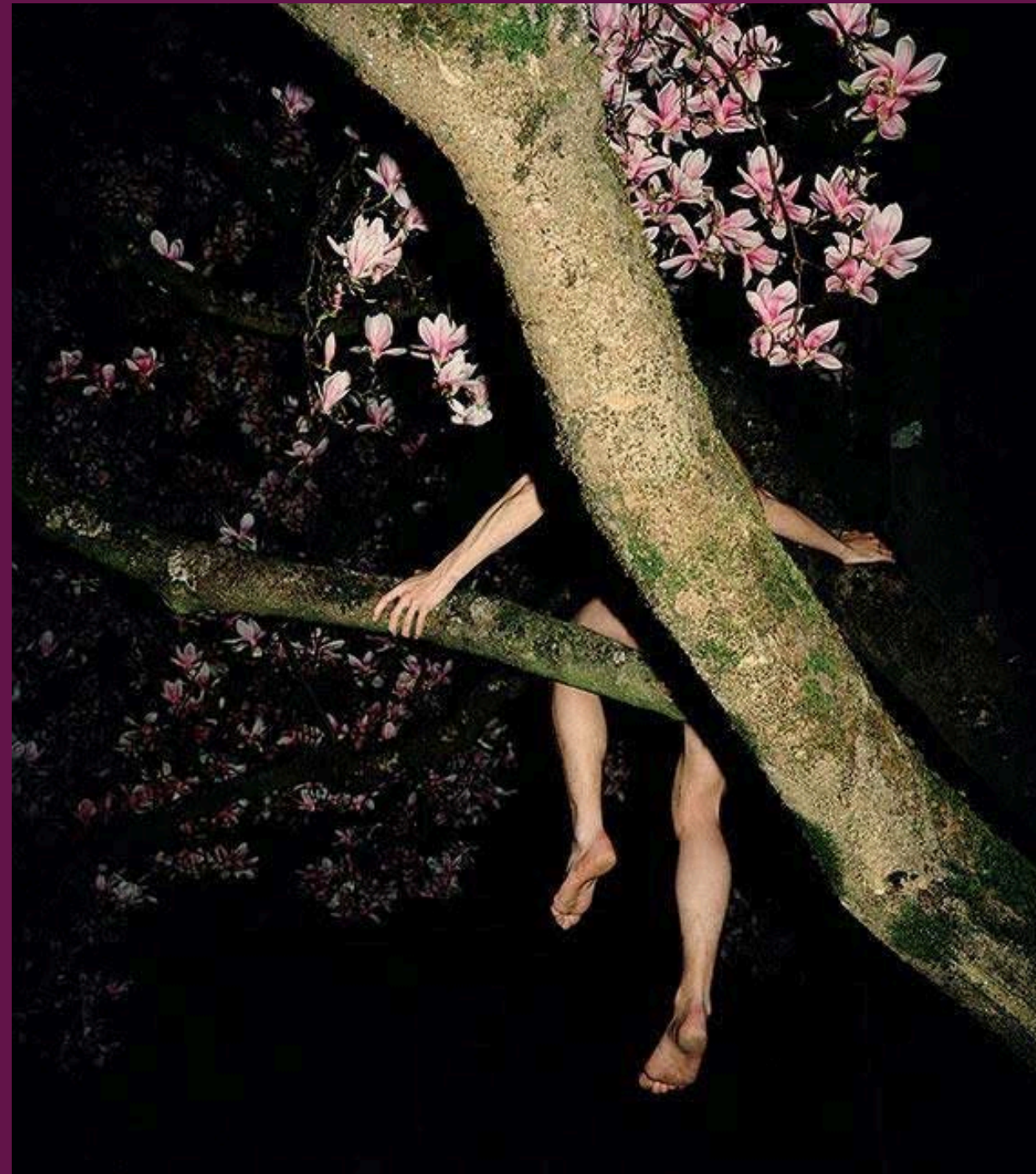
We are developing a biobased alternative to elastane fiber with seaweed natural stretch properties



For Society

Biobased & Biodegradable

Our elastane alternative is derived from seaweed, using its natural stretch properties. It is biodegradable and addresses the issue of microplastic pollution and textile waste in landfills.



Sustainable Production

Produced without land or fertilizers, our fiber has a significantly lower environmental footprint. It's non-toxic for both consumers and manufacturers, ensuring a safer production process.



For Brands

Meet Consumer Demand



Tera Mira's biobased elastane alternative allows brands to meet consumer demand for sustainable, high-performance products—without compromising stretch, fit, or comfort.

Enhanced Brand Reputation



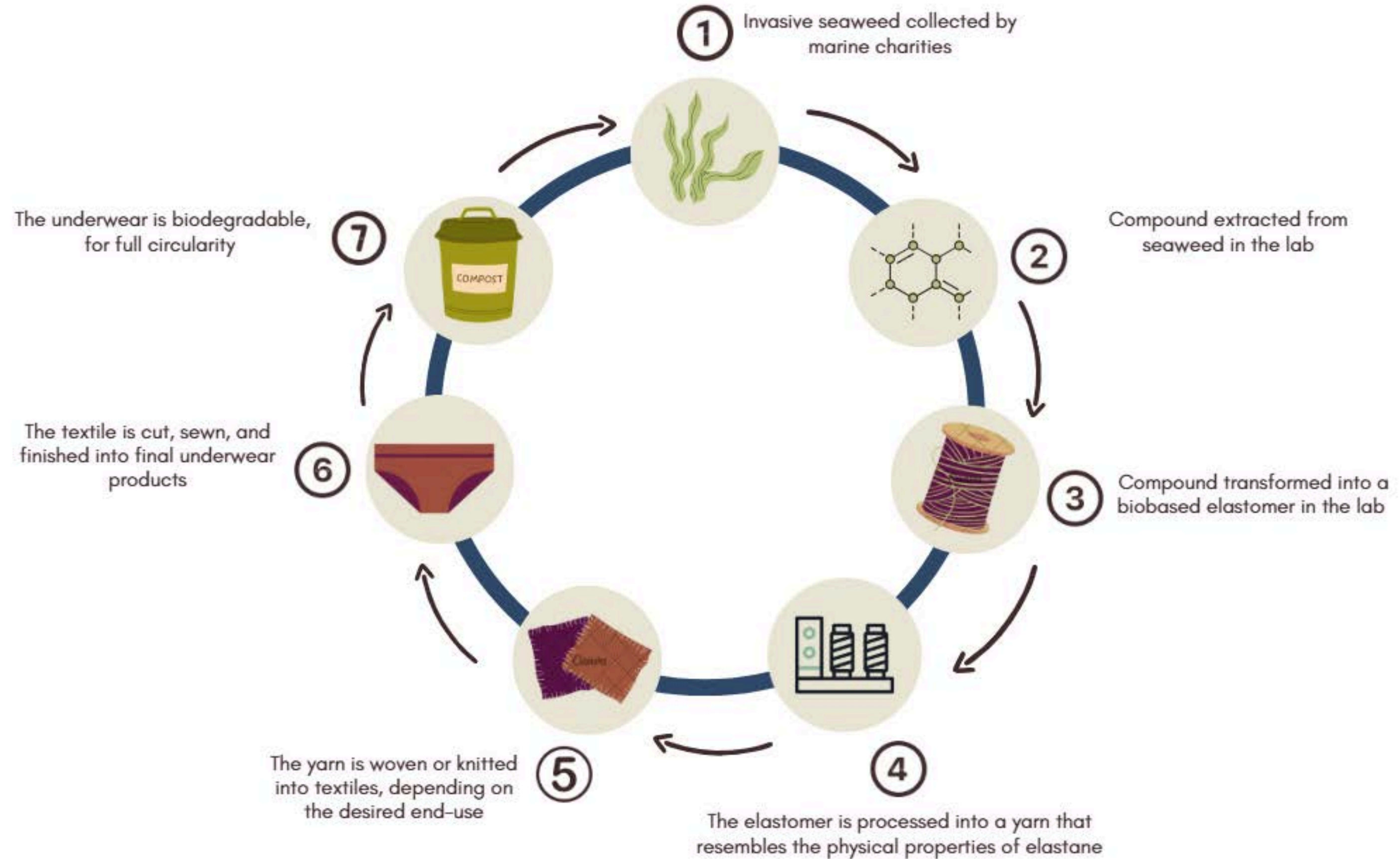
Adopting Tera Mira positions brands as sustainability leaders, improving their eco-credentials and strengthening consumer loyalty.

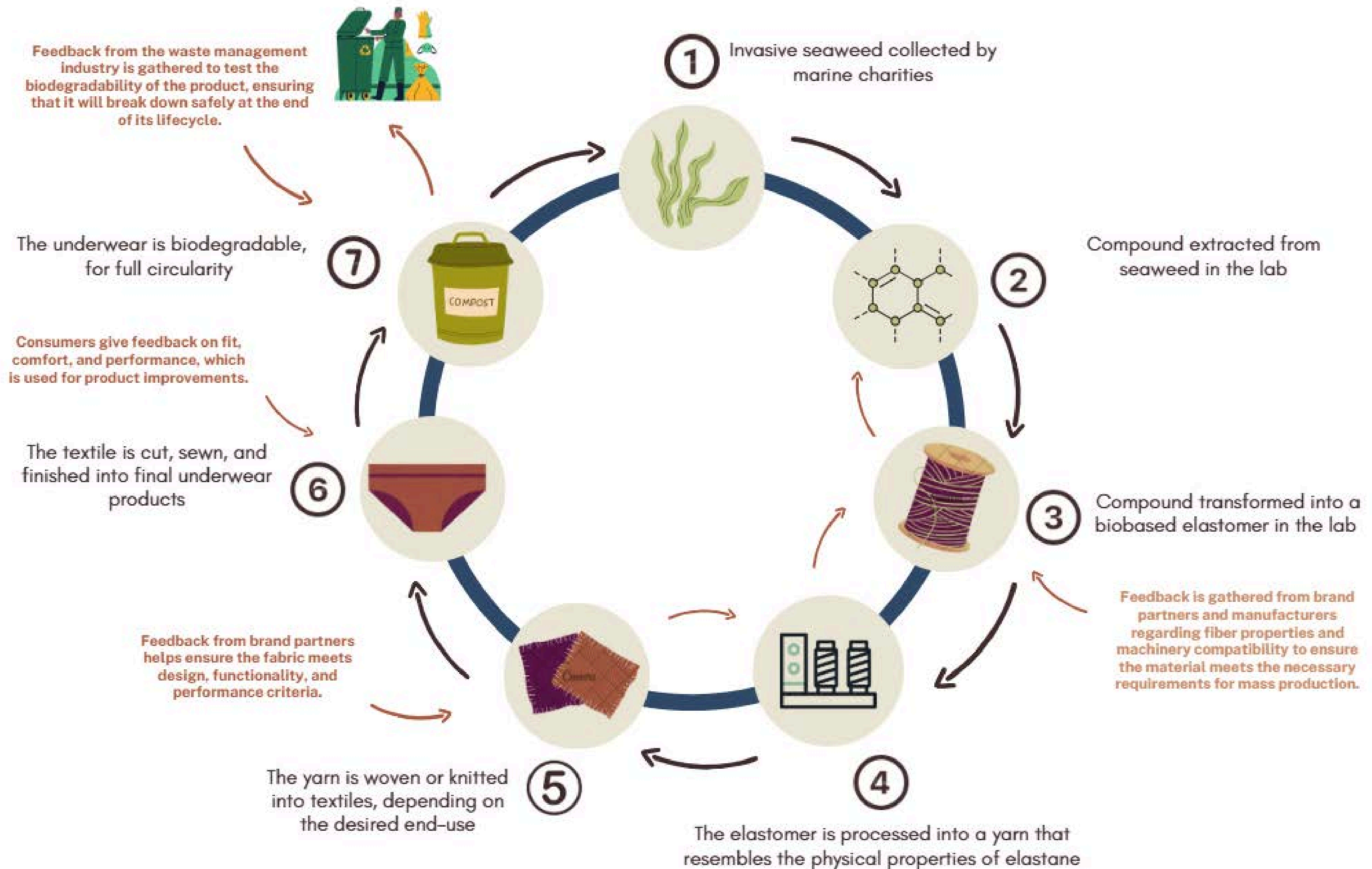
Regulatory Compliance



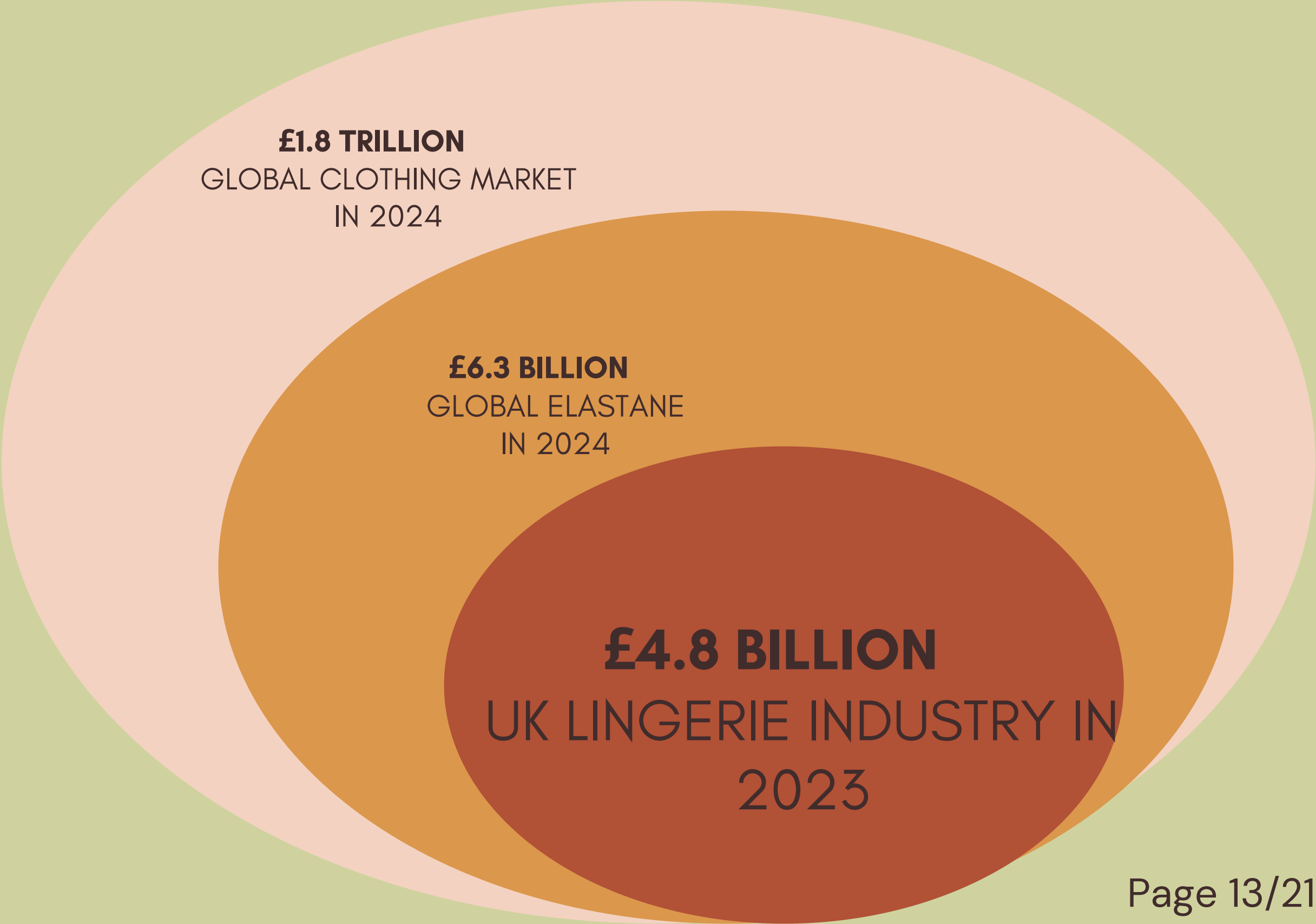
As regulations become stricter, using sustainable solutions like Tera Mira ensures brands stay ahead, mitigating future risks.

The Solution



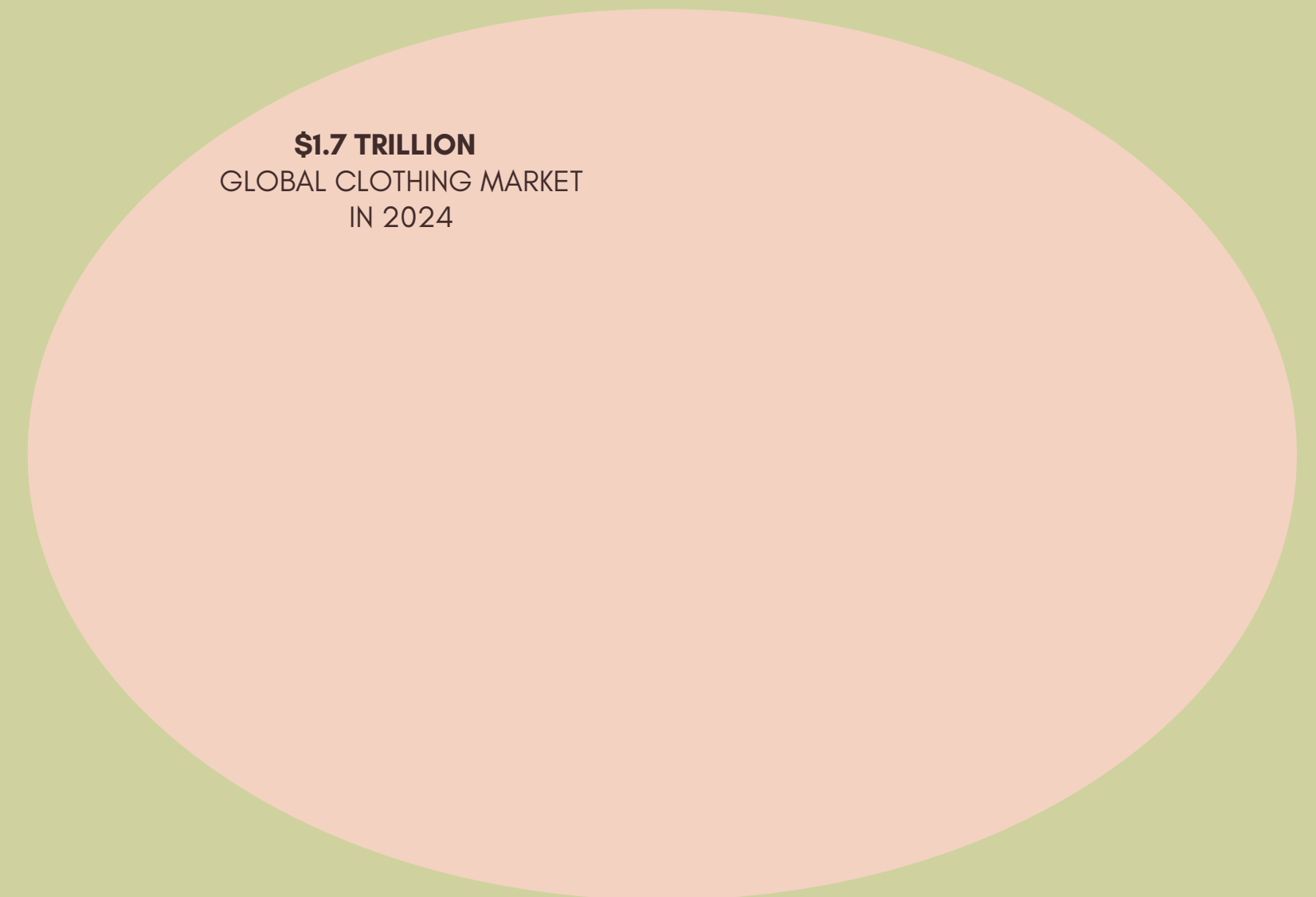


The Market



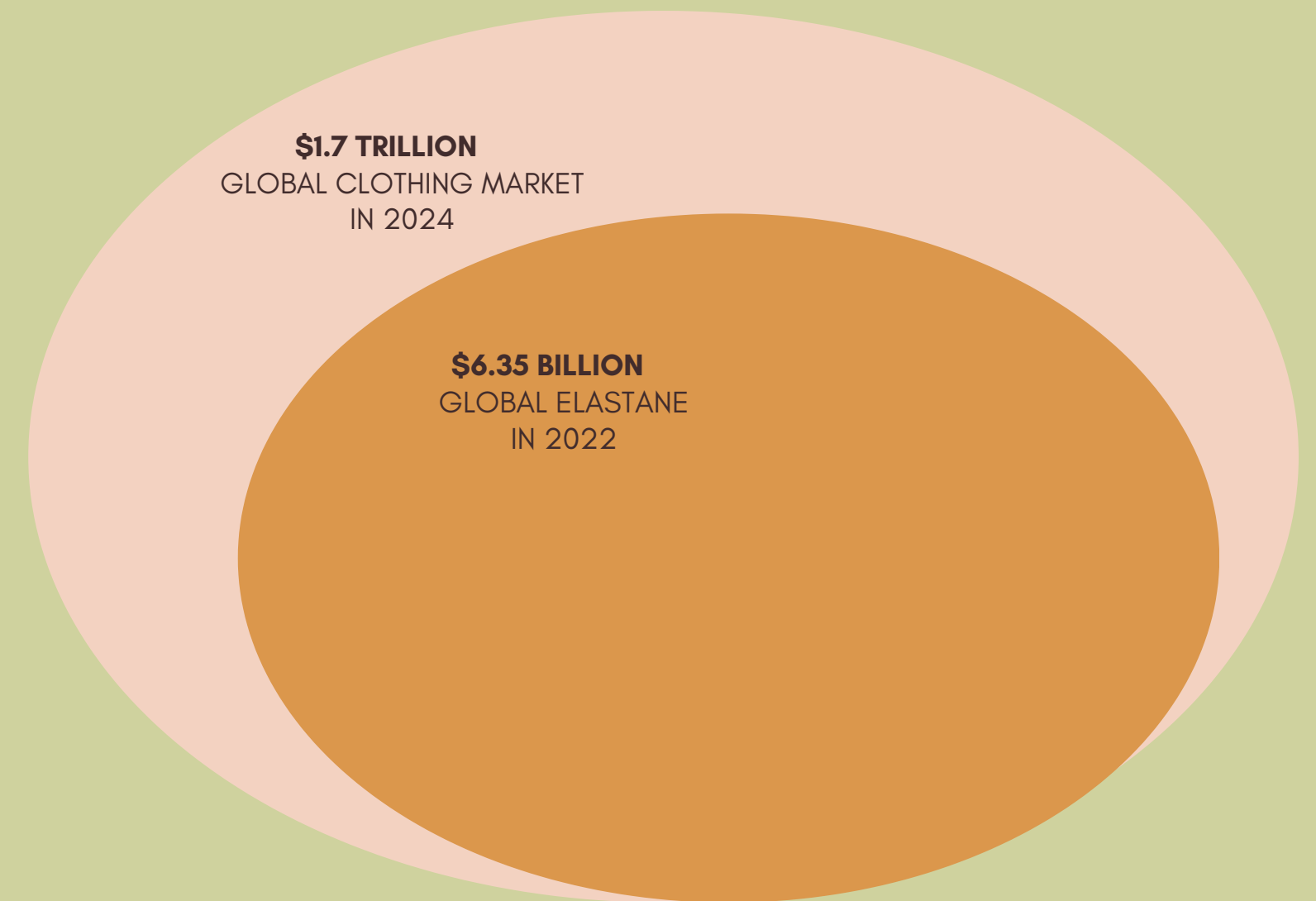
Global Fashion Industry: A Growing Demand for Comfort & Sustainability

- **Market Size & Growth:** The global fashion industry is valued at \$1.7 trillion, growing at 4.5% annually (Statista, 2024).
- **Rise of Functional Wear:** Demand for comfort, sustainability, and performance is reshaping fashion trends. The growth of athleisure, homewear, and activewear highlights the shift toward more adaptable and functional clothing (Intel, 2024).
- **Importance of Stretch Textiles:** Fit, flexibility, and comfort are now essential features, driving demand for stretch textiles.



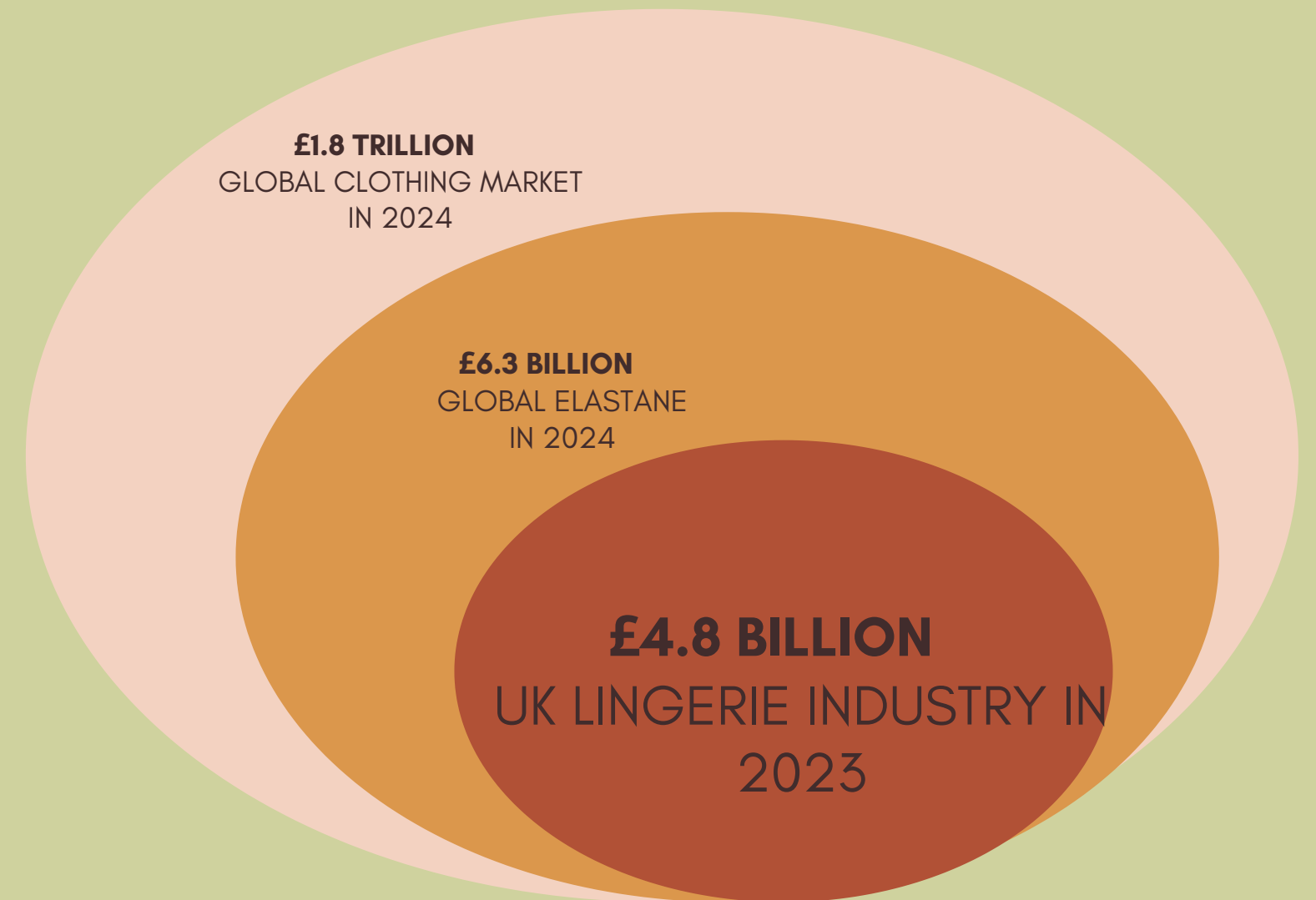
Global Elastane Market: Growth & Urgent Need for Alternatives

- **Role of Elastane:** Elastane fibers are a key component of stretch textiles for lingerie, activewear, and swimwear, making them indispensable to modern apparel.
- **Market Size & Growth:** The global elastane market is valued at \$6.35 billion, with a projected 7.06% CAGR, as stretch materials remain essential in modern clothing (Stratview Research, 2023)
- **Increasing Production:** Elastane fiber production grew from 1.2 million tonnes in 2022 to nearly 1.4 million tonnes in 2023, now representing 1.1% of the global fiber market (Textile Exchange, 2024).
- **Industry Shift Toward Sustainable Textiles:** 2025 Textile trends are moving away from synthetics in favor of “renewable synthetics” and bio-based materials (Premiere Vision, 2025).

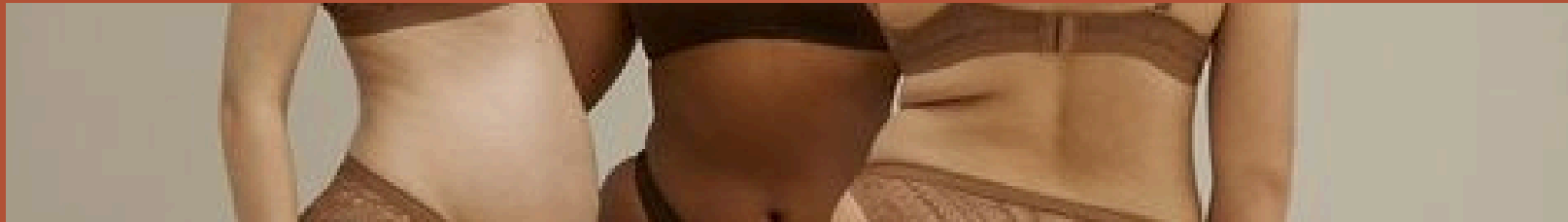


The UK Lingerie Industry: A Growing, Diverse Market

- **Market Size & Growth:** The UK lingerie market was valued at \$4 billion in 2023 and is projected to exceed \$5 billion by 2028 (Statista), driven by evolving consumer preferences and increased spending on intimate apparel.
- **Global Significance:** In 2022, the UK had the seventh-largest women's underwear market worldwide, an impressive ranking considering its population size compared to larger markets like the US and China (Statista).



Zoom In: The UK Lingerie Industry in 2025

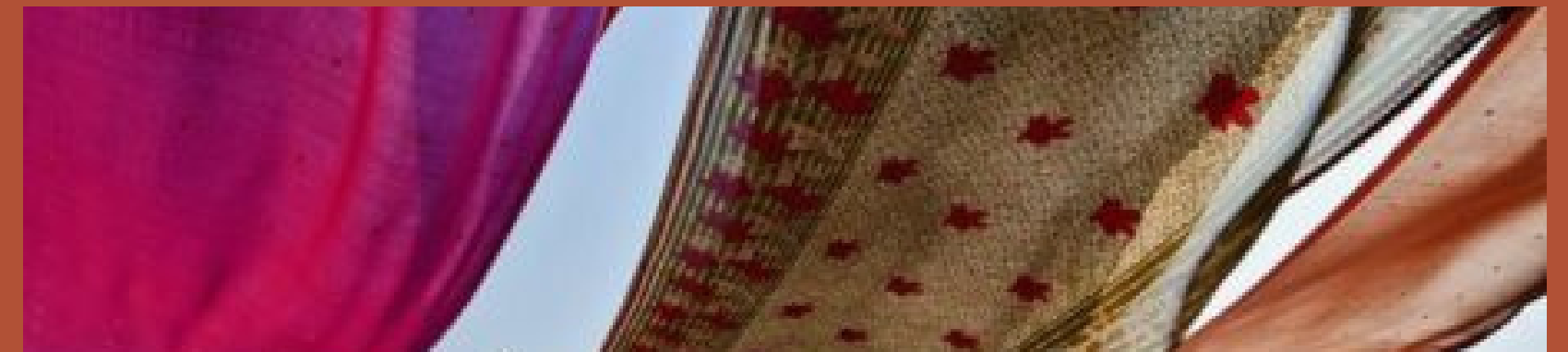


Customer Segments

- Varied Price Points & Accessibility: The market caters to all budgets, from affordable options like Primark's £7 sets to luxury brands like Agent Provocateur.
- Inclusivity in Size & Gender: Brands like ASOS and Bux Avenue are expanding their size ranges to accommodate any body types, while brands like Stripe and Stare offer unisex designs, breaking down traditional gender norms.
- Inclusive & Adaptive Offerings: M&S launched lingerie designed for women with stomas, demonstrating a growing focus on inclusivity, functionality, and consumer wellbeing.

Key Facts









- Global & Local Manufacturing: UK brands collaborate with international manufacturers like MAS Holdings, to produce carbon-neutral lingerie ranges, emphasizing sustainability in the supply chain. (MAS Holdings)
- Localized Production Models: Edge O' Beyond is an example of UK brands focusing on localized production, operating its own manufacturing facility in Wales, which guarantees quality control and craftsmanship while supporting other brands in the UK market. (Business Models)



The Gap in the Market

Existing "sustainable" fibers are typically either biobased or biodegradable but rarely combine both. The lingerie sector, with its unique demands for stretch, fit, and comfort, remains underserved by current innovations in sustainable materials.

Unlike existing alternatives that rely on synthetic processes, our technology mimics natural flexibility mechanisms, creating a fiber that is both bio-based and fully biodegradable while maintaining essential performance properties.

Competitor product	Market	Sustainably dervied	Biodegradable
Sorona	Sportswear, swimwear		
ROICA	Sportswear, swimwear, loungewear, lingerie		
COREVA	Denim		
Tera Mira	LIngerie		

The Team

Jeanne – Business



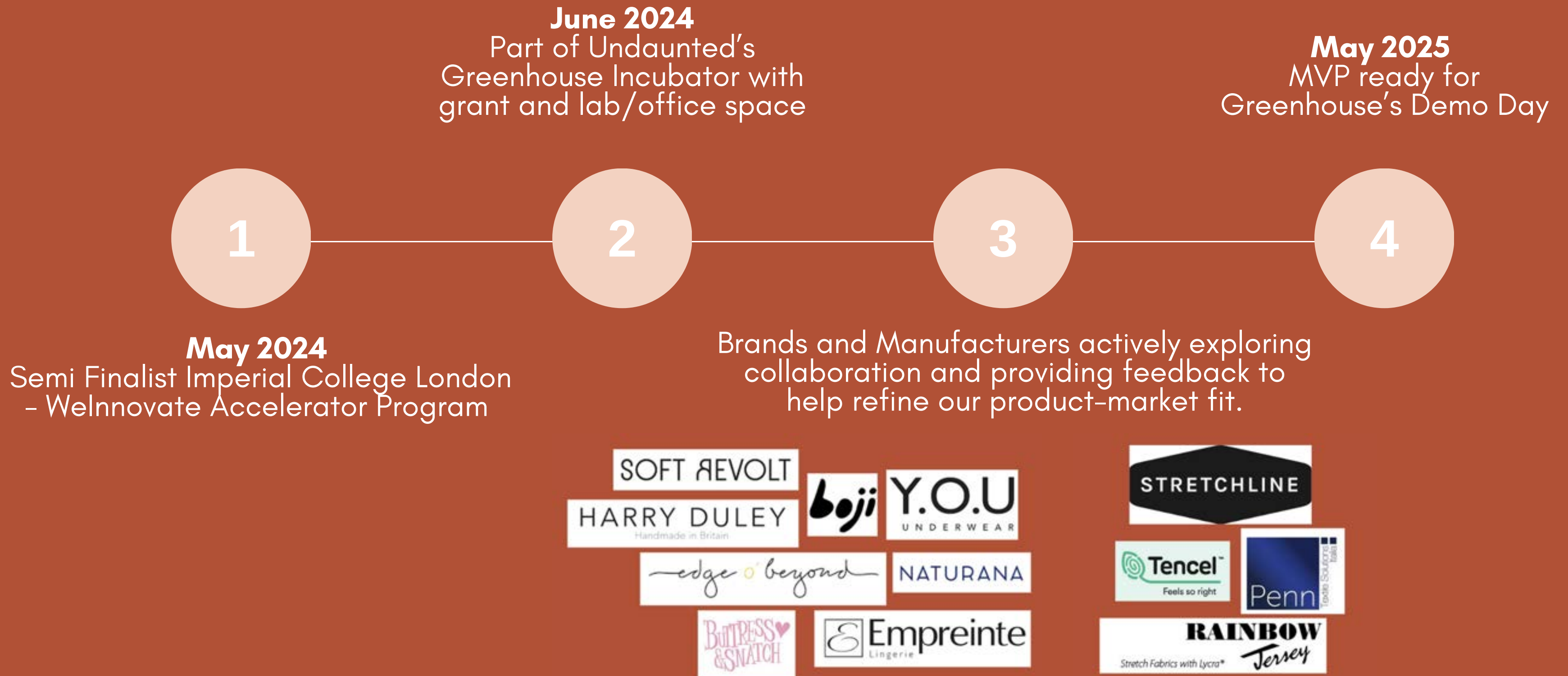
- Business & Sustainability Studies
- Master thesis on Impact of Second Hand Clothing Imports in Kenya
- Working Experience in Fashion with growing network in sustainable fashion

Lucy – Tech



- Award-Winning iGEM Leader with biobased rubber alternative
- Worked with Stryker on R&D and product integration, advancing biomaterial applications

Roadmap





Tera Mira

Working with Nature to Drive
Meaningful Change in Stretch Textiles

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