**Exploring the Business Case for Textile-to-Textile Recycling using Post-consumer Waste in the US: Challenges and Opportunities**

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The Environmental Protection Agency estimates that 17 million tons of textile waste is generated annually in the US (Fiber to Fiber Fashion, 2020). Approximately 15% of this waste is recycled (Brown, 2020). When considering that the average landfill tipping fee is $55 per ton, the cost associated with dumping textile materials into landfills would be approximately $700 million annually across the US (Adler, 2020). Some studies estimate much higher figures, even reaching over $3 billion (Adler, 2020). According to the international trade association, SMART (Secondary Materials and Recycled Textiles), much of the waste which is landfilled could have been recycled using existing and newly proven technologies (Secondary Materials and Recycled Textiles, 2021). These figures indicate that there are significant barriers to the scaling of these recycling options. Although the market indicators do not appear to be favorable for post-consumer textile waste as a monetizable input for textile-to textile recycling, there are well-established, negative environmental impacts of this waste being landfilled or incinerated (Stanescu, 2020). Therefore, establishing a system for post-consumer textile waste valorization is crucial (Hawley, 2006; Eppinger, 2022). The purpose of this research is to investigate the business case for using this waste as an input to textile-to-textile recycling. This research has three main objectives: explore the dynamics between post-consumer waste traders and recyclers; investigate challenges to faster scaling of textile waste feedstocks and the processing of this waste into new fibers; and provide theoretical and practical foundations for effective interventions in this area.

The study employs a Grounded Theory approach. Semi-structured interviews were conducted with eleven senior management representatives from textile sorting and fiber recycling organizations with operations in the US (*traders: Bank & Vogue; Trans Americas Trading Co, Reverse Resources, Premier Facilities Management, Recircled; recyclers: Gr3n S.A., PurFi Global, Circ, Recover, Giotex*). The transcripts were manually coded by two researchers into the emerging themes (Khan, 2014). The findings were constantly compared to each other to isolate emerging concepts. Credibility of findings was secured by triangulating two different sources of information (traders and recyclers) and through rich and thick descriptions of the emerging themes.

Five key thematic categories emerged from the data: *negative process economics; commercialization struggles; blocks due to current market dynamics, competitive advantages, establishing accountability for leading change* (McCauley & Jestratijevic, 2023)**.** These key thematic categories could be described as the five most significant factors that fuel or inhibit the business case for post-consumer textile waste in the US. Findings reveal that the scale of the textile waste problem is larger than the existing sector can handle, and textile-to-textile recycling is not scaling fast enough, particularly outside of the European Union. As with any circular system, there are many actors who must participate to make it work. To secure participation, all stakeholders need to be incentivized financially or through other, unique value propositions. Without sufficient incentives, the businesses needed to scale the textile recycling sector will not fully develop, meaning textile waste will continue to accumulate. However, there is no profit margin in trading post-consumer textiles for use only in textile-to-textile recycling; it must be built alongside other markets to be profitable for traders. When considering the point of view of a recycler using post-consumer textile waste feedstocks, low feedstock costs, its clear specification, and greater predictability are key to securing profitability.

In conclusion, feedstock standardization is needed because there appears to be a disconnect between recyclers and traders; traders are sorting for their known and understood markets whereas recyclers are asking for different specifications and at different prices. Further, we suggested a cascading approach to textile waste diversion to better align financial incentives and ideal environmental outcomes. Competition for a small percentage of available post-consumer textile waste specifications risks to put upward pressure on feedstock and recycled fiber costs jeopardizes the financial viability of recycled fibers and reduces the speed with which new technologies are applied to reduce textile waste destined for landfill. Extended producer responsibility (EPR) was the most commonly referenced policy throughout this study which addressed the accountability of brands through government-imposed financial penalties for non-recyclable items. Although frequently referenced, the details of this policy and resulting implications for their businesses were not well understood among interviewed parties. Research is needed to provide insights into how policy and regulation could contribute to joint value through the creation of financial incentives across stakeholder groups in the circular textile value chain, which would help fuel business development and textile waste sector growth in the US and beyond.

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