GREENBLUE®

FEATURE: CIRCLE ECONOMY

Chemical Recycling

Making Fiber-to-Fiber Recycling a Reality for Polyester Textiles

Circle Economy: Building the Infrastructure for Recycling Excess Textiles "Brick by Brick"

In 2012, Circle Economy ("CE") was founded to shape a "visionary and realistic future for our planet". As a cooperative social enterprise, Circle Economy works closely with businesses and cities to accelerate the transition to circularity through on-the-ground, action-focused development of practical and scalable solutions. The company has several sector-specific initiatives, including the Circle Textiles Programme, which collaborates to create a truly circular supply chain in order to reclaim the value of human, economic, and natural capital lost in today's linear system. The program develops the systems innovations necessary for this transition by producing critical data, tools, and pilot projects that are building a foundation for a circular textiles industry.

Pointing to the critical needs in the market that the Circle Textiles Programme was founded to address, Traci Kinden, project manager, states "unfortunately, a transparent and connected infrastructure of automated sorting capabilities, matchmaking between feedstocks and recycling technologies, and logistics to move the materials between stakeholders has not been developed".

CE defines "excess" textiles as pre-consumer, post-consumer, or post-industrial textiles that are bound for another use cycle (reuse, upcycling, high value recycling, or downcycling), landfill, or incineration. CE uses "excess" versus "waste" to emphasize that it is not the inherent value of these materials that is lacking but rather the lack of a connected system to realize their value. The organization's objective is to not only reclaim lost resources but to also create a more circular textile industry that will increase the quality and, therefore, market value of all textile materials intended for recycling. CE's Circle Textiles Programme has three primary initiatives it believes are fundamental to stimulating system-level change to make the textile industry more circular and more socially and economically profitable.

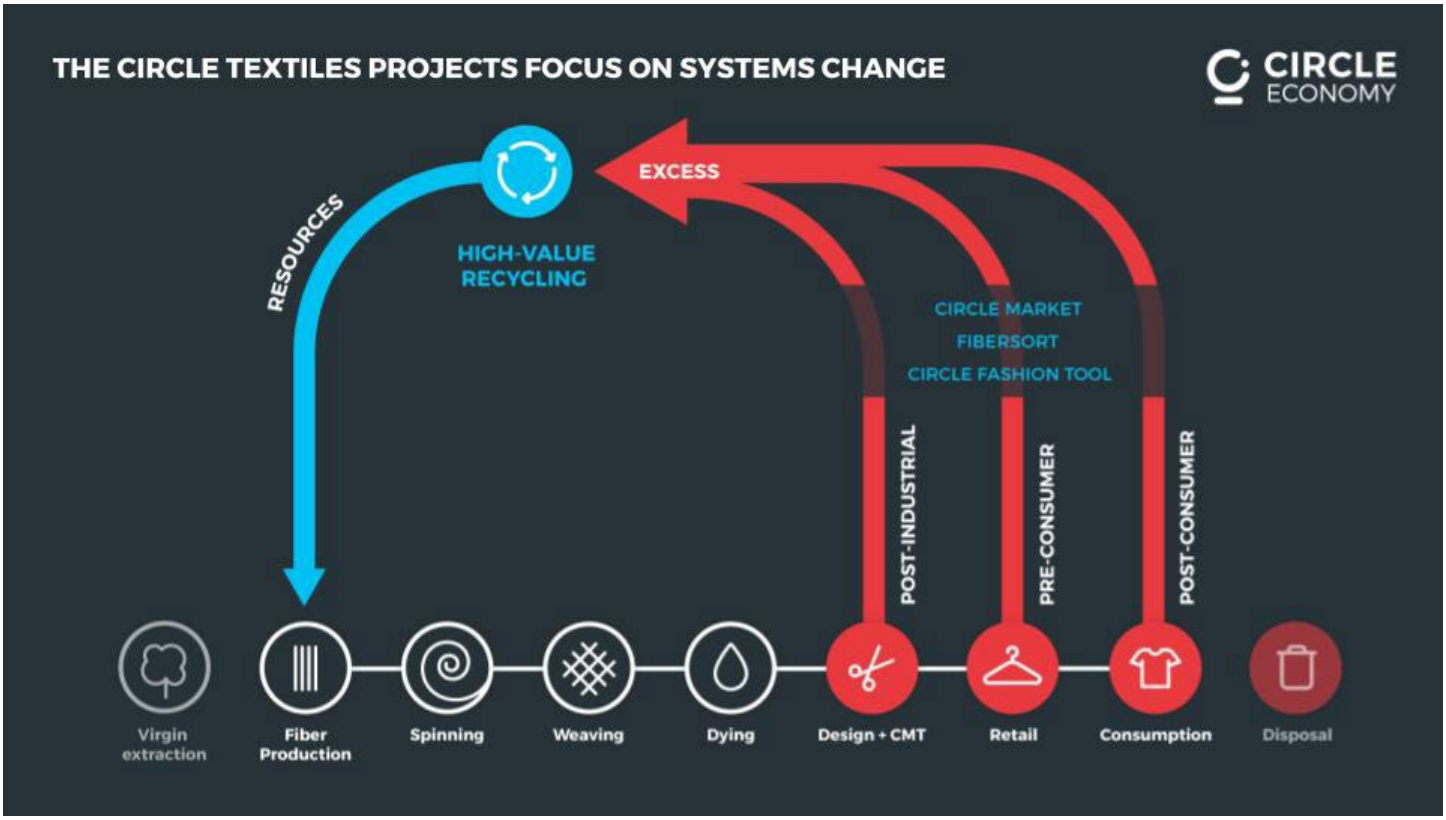
Circle Market

A digital online trading platform that connects the supply and demand of excess textiles. Such a platform serves several functions that are necessary for building an efficient and more sophisticated infrastructure for recycling textiles. First, it provides motivated buyers and sellers with the means to easily find one another. Second, it can be a source to define standard material specifications, provide an accurate characterization of listed textiles, and allow recyclers and other demand side users to distinguish higher vs. lower quality goods. Matching quality specifications with market-based price ranges will be key to creating a more efficient market that balances quality and cost and helps minimize risk for recyclers. Third, the platform is being designed to help mechanical and chemical recyclers make critical decisions about where to build plants or to focus material acquisition efforts by enabling them to identify national and regional feedstock zones to build their own supply chains. Circle Market is being developed in close collaboration with the necessary circular ecosystem of collectors, sorters, chemical and mechanical recyclers, manufacturers, and brands through working groups and peer review of CE research results and findings.[1]

Fibersort Project

Circle Economy and five other project partners launched a €3.53m project and received

[1] Kinden, Traci and Gwen Cunningham. Circular Textiles Infrastructure. Circle Economy, 2017.



SOURCE: CIRCLE ECONOMY, 2017

a €1.95m grant from Interreg North-West Europe to commercialize the Fibersort machine and release a series of related industry guidelines and reports. Fibersort is a technology that automatically sorts large volumes of mixed post-consumer textiles by fiber type. Once sorted, these materials become reliable, consistent input materials for both high and lower value textile recyclers. The project's written deliverables aim to facilitate the uptake of Fibersort technology within textile sortation and recycling companies, and increase the market pull for recycled textiles on the brand and retail side. CE is leading this consortium of partners to conduct research on advanced sorting of the "non-wearable" (i.e., garments that cannot be sold as used clothing due to age, damage, soiling, etc.) stream of textiles coming from the used clothing industry. The research team represents every step of the textile recycling chain. The equipment is being developed by Valvan Baling Systems, and project partners include Smart Fibersorting, Circle Economy, Leger des Heils (Salvation Army Reshare), Worn Again, and Procotex. The goal is to use recent advances in near infrared spectroscopy (NIR) to automatically sort large volumes of mixed post-consumer textiles by fiber type to maximize their value in the marketplace. The Fibersort technology has the potential to increase the quantity and purity of the recycling stream to channel materials to end markets where they have the highest value and commensurate price. This technology will be especially useful for mechanical and chemical recycling processes that require high percentages of a target fiber (e.g., PET, nylon 6, cotton) and as low a level of contaminants as possible so they can produce salable end products that will return to the textile supply chain as opposed to selling them outside of the industry.

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According to CE, manual textile sorting processes of post-consumer used clothing result in approximately 55% capture for used or "re-wearable" clothing, 40% as low-grade downcyclable or recyclable textiles, and 5% is designated as "waste" or "excess" textiles using CE's parlance. If these numbers are accurate, that means that approximately 45% of this single stream is ripe for optimization as potential raw materials for the creation of new textile products.

Circle Fashion Tool

Realizing that it will take time and much education to bend linear supply chains into circular ones, and with the support of the C&A Foundation, Circle Economy has recently launched the development of the Circle Fashion Tool. The tool's primary objective is to educate brands on what circular or end-of-life opportunities there are, and help them to assess which are most optimal for their business and circumstance. Furthermore, the tool aims to enable brands to operationalize selected circular or end-of-life opportunities, and importantly, to model the practical implications (business and environmental case) of those circular opportunities.

Circle Economy is looking to partner with forward thinking brands that would like to help influence the direction and functionality that the Circle Fashion Tool can potentially provide, and test the tool for their own purposes.

The Circle Textiles Programme believes that now is the time to collaboratively develop transparent, market-driven solutions to connect the players and facilitate the movement of materials back into the textile supply chain. These are the digital tools and technologies that will help to overcome bottlenecks, streamline processes, and accelerate the necessary and burgeoning transition to a new industrial paradigm. Its mission, research agenda and the practical solutions it is developing are unique in that they represent a holistic and multi-faceted approach to creating circularity in the textile industry. If successful, Fibersort, Circle Market and Circle Fashion Tool will bring technical, economic and environmental data that will be critical to creating more sustainable flows within the global textile sector.