

BTF Fall 2022 Forum

How can we scale up sustainable (bio-based) textiles recycling? To find an answer to this question BIOTEXFUTURE brought together Soex and I:Collect GmbH, Infinited Fiber Company, Wuppertal Institut, adelphi, FullCycle, IKEA, the German Environment Agency - Umweltbundesamt (UBA) and RWTH Aachen at the BIOTEXFUTURE Fall 2022 Forum.

The big WHY of scaling up textiles recycling. Climate change, textile waste and plastic pollution are just some of the negative environmental impacts that have driven policy makers to create new regulations to push measures like recycling and make the textile industry (among others) more sustainable. Transforming this series of regulations like the Extended Producer Responsibility (EPR) or Digital Product Passport into national legislation is in full swing. The deadline for practical implementation in industry is 2030. This puts companies active in the textile industry under increasing pressure to prepare themselves not only to stay compliant, but also to stay competitive due to simultaneously increasing consumer demands. We answered the why. So, what about the how?

Collaborating across stakeholder groups and national borders. Driving such a systemic change requires more than a few players becoming active. Crucial in this context is a multi-stakeholder collaborative process. This goes beyond national borders, i.e., thinking and acting on a global level matching the worldwide scope of the textile industry. Burcu Tuncer from adelphi emphasized in her presentation (see video of Burcu Tuncer's presentation here) the importance of collaboration on all geographic levels giving practical examples like private-public-partnerships (PPPs). In this spirit, a holistic way of thinking will be necessary to foster collaboration across global, national, regional, and local actors. From a partnership perspective, value chain and ecosystem collaboration, eco-design leveraging new technologies and a data driven business case will enable scaling. Furthermore, business models have to transition towards circularity. These include activities like providing textile products as services, recovering textiles after disposal, shifting towards circular supplies, but also earlier in the value chain reducing manufacturing waste, facilitating demand for circular products and services, and extending the product lifetime of textiles.

Understanding circularity as loops within a loop. For recycling partnerships to be integrated in a circular textile economy a clear and shared definition of the latter is still needed as Burcu Gözet from Wuppertal Institut pointed out while sharing the research perspective (see video of Burcu Gözet's presentation here). This is particularly relevant as the misconception of recycling being similar to or even the same as circularity still persists. Recycling is just one of the many loops or measures within the big loop of a circular textile economy that reinforce the entire system. Other loops or measures include repurpose, remanufacture, retro logistics, reuse, redistribute, repair, rent, refuse, reduce, and share. Some of them can be used at multiple points in the value chain and therefore involve activity by different value chain actors ranging from producers (textile production/collection and sorting) to

customers (use phase). Yet, the quantity and variety of loops, does not diminish the importance of textiles recycling. This is especially of interest for actors involved in the production, collection, and sorting of textiles as well as brands and retailers. They will be the ones directly affected by the EPR, Ban on Destruction of Unsold Textiles, Green Claims, Ecodesign Requirements and Digital Product Passport all of which address or include textiles recycling to some extent.

Building a complementing recycling infrastructure. There are many methods to recycle textiles including biological, chemical, and mechanical recycling. All of these methods are at various stages of development. Mechanical recyclers for example are currently working on material recognition technologies, which are vital to simplify the recycling process like Jonas Stracke from Soex and I:Collect GmbH underlined (see video of Jonas Stracke's presentation here). Methods, however, do not only vary with regards to their technological developments, but also with regards to their respective footprints (carbon, water, etc.). Partly it is already scientifically confirmed that some recycling methods have a lower environmental footprint than producing new products with virgin material. The more these methods and the related technologies mature, the more research will deliver insights on environmental impacts from life cycle assessments (LCAs) and environmental impact assessments (EIAs). This will enable the textile industry to combine methods to build an infrastructure with a lower negative environmental impact. To make this work, it is, nonetheless, pivotal to see these different methods, like chemical and mechanical recycling, as complementing to and not competing with each other. This was pointed out by Petri Alava from Infinited Fiber Company, a biotech startup focusing on chemical recycling of cellulose-rich raw materials (see video of Petri Alava's presentation here).

Jointly investing in emissions-reducing recycling solutions. Building this infrastructure will need additional financial resources. But what are investors looking for when putting their money into textiles recycling? According to Kyle Adkins from FullCycle it is all about emissions reduction (see video of Kyle Adkins' presentation here). Investors are increasingly motivated to invest in startups, which are profitable, but which can additionally show how their recycling activities contribute to reducing greenhouse gas emissions. For startups in Europe and North America this is even easier as they can take advantage of old textile infrastructure, which only needs to be revitalized. This would save transport emissions and by that score with investors. But again, to scale it will not be enough to only rely on private equity firms for investments. Industry will need to meet these recycling startups in the middle and invest as well.

Harmonizing legislation and experimenting with recycling solutions. But not only industry needs to accommodate startups, it is also the national policymakers' turn to come industry's way. Brands and companies working on textiles are still facing the challenge of vastly different recycling requirements in various countries. As this adds additional complexity to the implementation of recycling solutions, policymakers need to harmonize legislation across borders. Both Anna Palmberg from IKEA and Brigitte Zietlow from UBA highlighted this need for harmonizing legislation as well. This, in turn, should then enable actors from different EU countries to cooperate and experiment with recycling solutions across borders. As there is still a lack of opportunities to experiment in this context, Marco Schmitt

from **RWTH Aachen** vouched to create those possibilities (see the video of the panel discussion with Anna Palmberg, Brigitte Zietlow and Marco Schmitt **here**).

Whether it is policymakers, who created new regulations or brands and startups, that began to rethink material resources, production methods, pricing and eventually business models, most actors involved have started their journey to scale up sustainable (bio-based) textiles recycling. However, this is only the start of the trip. As we could see at the BIOTEXFUTURE Fall 2022 Forum, there are still a series of leverage points where solutions can and need to be implemented. Conceptually, circularity and recycling still need to be understood and properly differentiated. Furthermore, legislation needs to be harmonized and experimentation with recycling solutions needs to be encouraged. In parallel, investments need to be made jointly and in emissions-reducing recycling solutions, while setting up the recycling infrastructure in a complementing manner. And all of this can only work effectively when collaboration across stakeholder groups and national borders is fostered. Quite an itinerary, but now is the time to gain momentum and make sustainable (bio-based) textiles recycling a reality.

For the videos of the BIOTEXFUTURE Fall 2022 Forum and more information on BIOTEXFUTURE in general join **our LinkedIn-group for free here**. In the group, you will also find more information on the **new BIOTEXFUTURE call** for project proposals. Inform yourself as well at **<https://www.biotexfuture.de/>**. The website is currently under construction but will soon be available again.