

TEXTILE FUTURE

Information – Background – Strategies for the use of used textiles



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1. Preamble



Textile manufacturing and consumption is highly globalised, with millions of producers and billions of consumers all over the world.

This results in enormous environmental and climate burdens as well as emissions of pollutants. When looking at the impacts resulting from the supply chain from an EU consumption perspective, clothing, footwear and home textiles have the fourth highest impact category for the use of primary raw materials and water (after food, housing and transport). The supply chain ranks second for land use and fifth for greenhouse gas emissions.¹

Massive amounts of chemicals are required to produce cotton textiles, and the industry also accounts for a large share of the global fresh water consumption. Every year, Europeans buy an average of 26 kg of textiles per capita. A considerable part of these come from third states, mostly from emerging and developing countries, where most of the environmental pollution occurs. The garments, however, are worn for an ever shorter period of time. This leads to an average of 11 kg of textiles per person and year being thrown away in Europe.²

The figures impressively demonstrate the importance of proper handling of used textiles. These have always been an important raw material. To this day, the collection of used textiles is associated with the issue of clothing donation. The original disaster relief and regional trade in used textiles has become a global market. Today, modern companies sort in a very differentiated way in order to reuse as much as possible. The industry of used textiles thus makes a positive contribution to reducing the environmentally harmful effects that arise in the production of new textiles.

The member companies of the Gemeinschaft für textile Zukunft (GftZ) are active in the areas of collection, sorting and recycling of used textiles. It is of great interest to ensure that used textiles are recycled at the highest possible sustainable level. For this reason, GftZ is committed to the sustainable handling of the raw material “used textiles”.



2. Sector profile - Dealing with used textiles in Germany

The term “textiles” refers to new or used clothing and home textiles, including footwear and accessories. The definition of textiles is usually broadly interpreted.³ Textiles (which become used textiles after their use phase) include:

Clothing, meaning anything that covers the body, such as outer clothing (also leather, furs) and underwear, shoes in pairs (footwear) and other accessories (except jewellery) such as belts, hats, caps, scarves, shawls, handbags, backpacks, home textiles such as bed and table linen, washcloths, hand, dry and bath towels, etc. Textiles also include bedding (eiderdowns, quilts, pil-

lows etc.), decorative fabrics (cushions etc.), other blankets, curtains with drapes and net curtains. Non-electric soft toys are also included.

Not included in textiles within the meaning of this guideline are upholstered furniture and mattress fabrics, carpets, tents, tarps, etc. Neither included are clothing and footwear with permanently installed electrical appliances, other consumer goods, mattresses and foams. (Clothing and footwear may be equipped with permanently installed electrical functions. In this case they are subject to the Electrical and Electronic Equipment Act (ElektroG) as *lex specialis*.)

2.1 Domestic availability and collection of used textiles

Several options are available for the collection of used textiles from private households, which are listed in the table below.

Table 1: Responsibilities for used textiles collected from private households

Responsibility	Legal basis	Explanation
Municipal collection	(§ 17 Para. 1 KrWG)	Collection is mainly carried out through bring systems at container sites or recycling centres by the public waste management authority's or by a company commissioned by the public waste management authority.
Commercial collection	(§ 3 Para. 8 No. 10 in conjunction with Article 17(2)(4) KrWG)	Collection is mainly carried out through bring systems at container sites.
Non-profit collection	(§ 3 Para. 8 item 17 in conjunction with § 17 Para. 2 No. 3 KrWG)	The collection is mainly carried out through bring systems at container sites or through pick-up systems directly at households.
Voluntary take-back systems	(according to § 26 KrWG)	The used textiles are taken back either directly at the shop or a container is placed next to the shop (e.g. in the parking lot of the shop).

Textiles from trade and industry are disposed of on the basis of § 7 Waste Management Act (Kreislaufwirtschaftsgesetz) in conjunction with the regulations of the Commercial Waste Ordinance by the place of origin, or the disposal is entrusted to the private sector. Below are examples from the main sectors / places of origin:



Table 2: Textiles from trade and industry

Sector / Place of Origin	Examples
Industry	Production wastes from textile manufacturing
Industry	Workwear, industry specific remnants
Hospital	Bed sheets, workwear, bandages, laundry bags
Hotels and food service	Bed sheets, table linen, hand and dish towels, workwear
Cleaning companies	All types of textile waste, especially from large-scale sources (hospitals, hotels, restaurants, etc.)
Workwear	Workwear, uniforms (e.g. of the German armed forces, police and fire department) and other textiles for professional use.

Some information is available on the consumption of used textiles from private households. However, specific data on commercial quantities and also production waste, such as cutting waste for instance, are not available.

The analysis of used textiles in the final report “Evaluation of the collection and recycling of selected material flows for the further development of the circular economy”⁴ showed that the potential collection quantity for 2018 was approx. 1.56 million tons. The collection volume was estimated to be approximately 1 million tons. Overall, it was concluded that there is no exact data basis, as no reporting obligations apply to this waste stream so far. Only public waste management authorities report their collection volume as part of the waste balance sheets of the federal states.

The collection rate for used textiles in Germany is around 64%, meaning that the system already covers most areas. The system is also well established in terms of its diverse offerings and is accepted accordingly by citizens. Around 27% of the collection volume is collected via municipal systems.⁵ The largest share, over 70%, is collected via commercial schemes, charitable collections or voluntary take-backs.

During the collection and take-over of the collectables (collection system), gentle processes and operations are required in order to maintain the quality of the collectables. As a general rule, an initial inspection must be carried out when the collectables are taken over. Using used-textiles containers with bottom hatches, transfer or hook-lift systems poses the risk of cross-contamination of the all garments, since foreign and contaminating materials (e.g. wet or heavily soiled portions) contained in the used-textiles container cannot be removed when the collection vehicle is filled.

Mixed collection with other recyclables and/or waste, even if the used textiles contained are packed in bags, involves the risk of cross-contamination and staining, which leads to a considerable reduction in the quality of the used textiles. Mixed collection also results in an increased effort for separating the used textiles. The same applies to systems such as the so-called “duo-bin” or “bin afterwards”.

2.2 Sorting and preparing the reuse of used textiles

The used textiles are prepared for reuse firstly by sorting them. Interfering materials are removed, and secondly, for every single article it is necessary to decide about the wearability and marketability.

The sorting of used textiles represents the only process in the entire waste management sector in which waste is prepared for reuse predominantly and to a relevant extent.

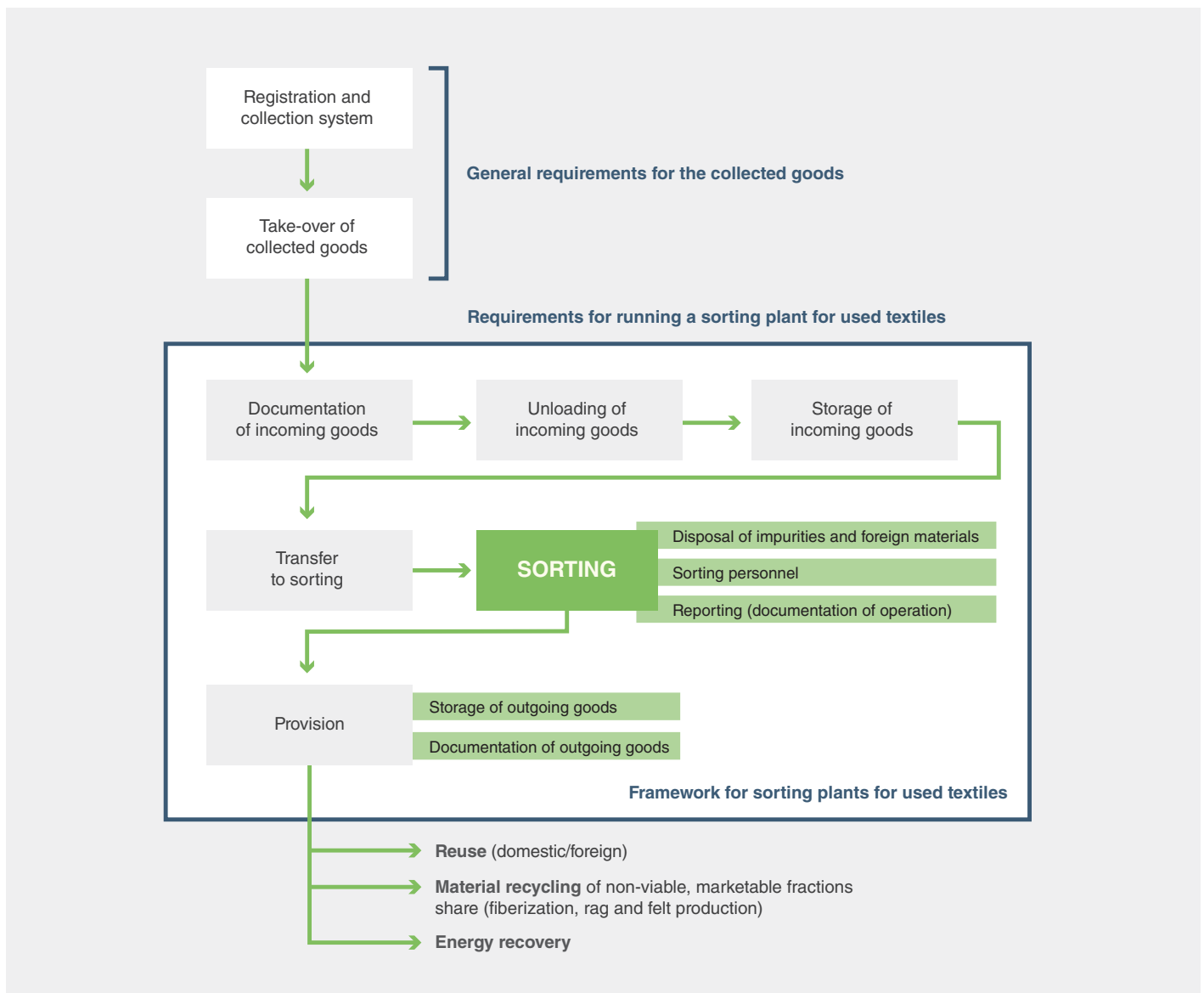


Figure 1: Requirements for the storage and sorting of used textiles

The sorting of used textiles is a time-consuming and usually multi-stage process. Due to the current state of the art, it is not possible to automate this process. Modern sorting facilities often offer the possibility of

automating internal transport processes; however, the preparation for reuse requires that each individual used textile is manually inspected and assessed by an expert sorter.

2.3 Reuse and recycling of used textiles

According to the findings and surveys for 2018, the whereabouts of the collection volume after sorting are as follows:

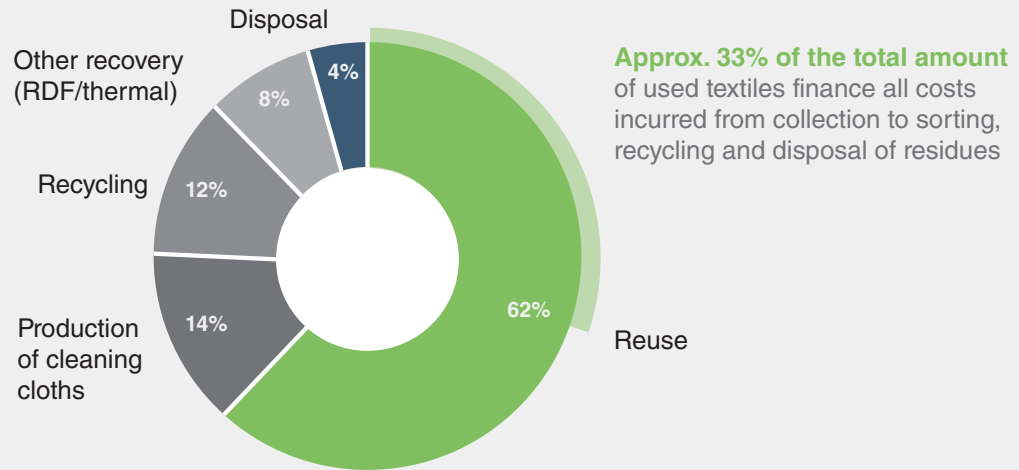


Figure 2: Whereabouts of used textiles after sorting according to the bvse Textile Study 2020⁶

In Germany, no municipal waste fees are required for the collection and sorting of used textiles. This expense is currently financed by the proceeds from the reuse of an ever

smaller proportion of used textiles that are still viable and for which there is a market.



Production of cleaning rags:

Used textiles are sorted according to colour and material (cotton, terry, jersey) and cut into cleaning rags (at least 20x30 cm according to DIN 61650).

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2.4 Production and use of recycled fibres

Currently, there are different types of recycling technologies for textile waste, including mechanical and chemical recycling. Mechanical recycling involves processes in which textile waste is processed into industrial wipes, padding and stuffing for the automotive industry, sound and heat insulation, and non-woven mats. About 20% of the 2.7 million tonnes of used textiles currently collected separately in Europe each year are used as industrial wipes or for other recycling purposes in European and global markets.⁷ Typically, mechanical recycling includes process steps such as cutting, tearing and needling, where non-textile components are also removed.

Of particular interest are fibre-to-fibre recycling technologies, in which textile fibres are recycled for the use in new textiles. Fibre-to-fibre recycling is carried out either via mechanical or chemical recycling. There are many technological approaches, of which most are still in pilot stages. Therefore, it is estimated that only a very small proportion of separately collected used textiles (approximately 1% in 2017) are recycled using the current fibre-to-fibre recycling technologies.⁸

The European Commission has compiled a list of some of the current as well as some of the most promising technologies in the field of mechanical, chemical and thermal recycling. The list includes mainly European technologies, but some technologies from outside Europe have also been included.



Torn goods for insulation, painter fleece or the automotive industry

Table 3: Summary of textile recycling initiatives technologies⁹

Technology	Different input for different processes	Applications / examples from different processes
Mechanical	Industrial textile waste, pre- and post-consumer waste from different fibres	Fibres for insulation, automotive industry, yarns for new textiles or other applications.
Chemical	Polyester and polycotton blends; nylon from fishing nets and carpets, pre- and post-consumer wastes	Preparation and production of fibres for various applications.
Thermal	Textiles that contain Elastan	A thermomechanical process for separating elastane from other synthetic textile fibres is under development. Through this process, raw material pellets can be obtained that can be used to produce new yarn by injection moulding.

The complete list can be found in the appendix (page 23)

2.5 Legal basis for the collection and recycling of used textiles

In accordance with § 17 KrWG, used textiles from private households must be handed over to the public waste management authority. Exceptions are voluntary take-backs (§ 26 KrWG), non-profit collections (§ 17 para 2 in conjunction with § 18 KrWG) and commercial collections (§ 17 para 2 in conjunction with § 18 KrWG). If an

extended producer responsibility scheme was in place, the obligation to hand over these used textiles would no longer exist. For used textiles from other sources, there is only an obligation to transfer the waste for disposal to the public waste management authority.

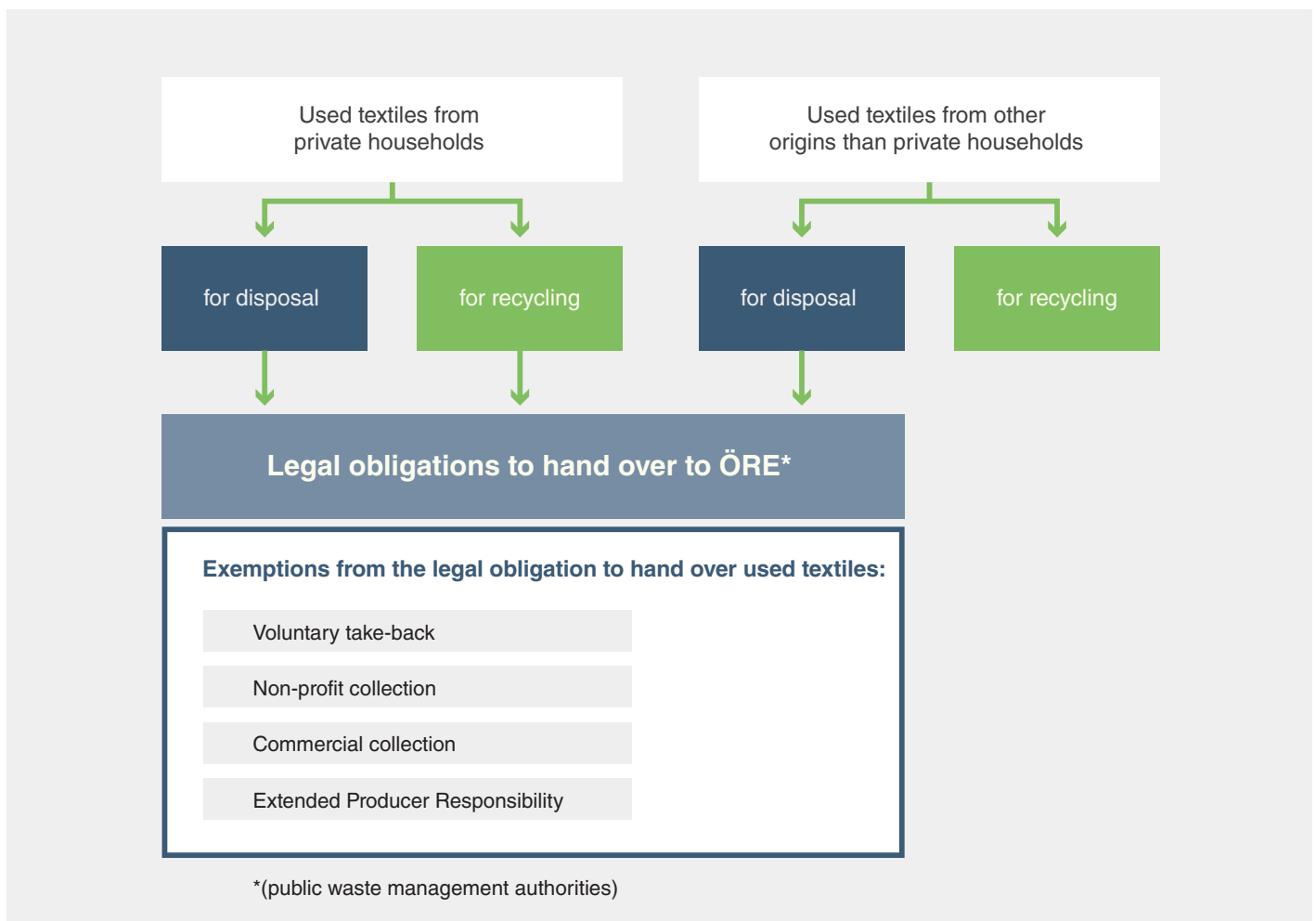


Figure 3: Legal obligations to hand over and exemptions for used textiles

Currently, there is no obligation to separate waste for public waste management authorities. A well-functioning collection system, however, has been established through the private sector. Due to the various collection actors (commercial, non-profit and municipal collection), a very high collection rate of approximately 64% has been achieved in Germany.

As of 1 January 2025, public waste management authorities have to fulfil an obligation to collect textiles in a separate collection.¹⁰ This may affect private and non-profit collectors as far as it restricts their collections.

2.6 The use of used textiles – A contribution to sustainability

The high-quality collection, sorting, reuse and recycling of used textiles is a significant contribution to the sustainable use of textiles in many regards.

✓ Creating jobs:

Especially through high-quality collection and differentiated sorting aiming at reusing as many used textiles as possible, jobs can be created that are also available to personnel who did not have any other vocational training.

✓ Resource protection:

With every used textile that is reused as a marketable and acceptable product after sorting, important resources are being saved that are necessary for the production of new goods.

Most of the textile industry today relies on non-renewable resources - a total of 98 million tonnes per year. This includes oil for the production of synthetic fibres, fertilisers and pesticides for cotton cultivation and chemicals for the production, dyeing and finishing of fibres and textiles. Textile production (including cotton cultivation) also consumes about 93 billion cubic metres of water annually, which accounts for about 4 per cent of the global water supply.¹¹ But the industry's immense footprint goes beyond the use of raw materials. In 2015, greenhouse gas (GHG) emissions from textile production totalled 1.2 billion tonnes of CO₂ equivalent, more than the emissions of all international flights and maritime shipping combined.¹²



✓ Minimising resource usage:

After preparing the textiles that are no longer marketable and wearable, textile fibres can be recovered to replace primary raw materials.

✓ Demand for used textiles:

The demand for second-hand goods is very high in many countries. According to rough estimates, about 70% of people buy second-hand clothes.

✓ Waste hierarchy:

The reuse and recycling of used textiles complies with the waste hierarchy and discourages the disposal in incinerators and landfills.

3. Challenges in handling used textiles

The current developments show that a change is strongly needed:

- Current fashion trends lead to a “fast fashion” behaviour. While clothing production has roughly doubled in the last 15 years, the average lifetime of textiles worldwide has decreased by 36% during the same time.¹³ In Germany, the period of use has even halved in this period.¹⁴
- Low-priced goods made from material mixes are on the increase. This reduces the quality of the textiles, which has negative consequences for the reparability and durability of the products. Moreover, even established recycling processes are becoming increasingly challenging.
- Low-quality textiles from Asia are offered on the market in developing countries in competition with second-hand goods.
- Sales markets are additionally narrowed by crises and restrictions.
- The share of used textiles that cannot be reused will continue to rise due to an increase in quantity and a decline in quality.
- As waste management concepts encourage the separate collection of used clothing in industrialised countries more and more, increasing collection volumes can be expected throughout Europe. In particular, the implementation of the Waste Framework Directive, according to which used textiles must be collected separately throughout Europe from 2025 on, will result in a very relevant increase in quantities. This will have an enormous impact on the international market for used textiles.

All these developments will lead to lasting and significant changes in the used textiles industry. The current financing model is no longer feasible in the future. The necessary changes for the organisation and financing of a sustainable model for the use of resources (especially fibres) must be considered now.



4. Strategies for the future of textiles

It is particularly important for the sustainable use of textiles to use the raw materials for as long as possible. For used textiles, this is done first and foremost through reuse. Textiles that are not marketable and wearable also offer a valuable raw material for use in new products.

4.1 Information and transparency

To ensure high-quality recycling, information on the characteristics of the used textiles is required. Depending on the intended recycling process, this relates in particular to fibre type, chemical use, colour and structure and has an impact on systems for identifying the material fractions and labelling the products.

4.2 Change in production and design

Recovering used textiles at the highest possible beneficial level means that the raw material of the fibres from the used textiles replaces primary raw material for fibre production. However, for this to happen, the appropriate preconditions must be met. All actors in the supply chain, from the designer to the producers of the fibres and fabrics, as well as the producers of the textiles, must cooperate.

A prerequisite for the recycling of fibres is their recyclability - that means, however, that specifications for when textiles are considered to be recyclable must be defined. This depends not only on the nature of the fibres and fabrics and the design of the textiles. It also depends on the recycling technology that is available today or that is expected to be available as promising developments towards this end are underway.

The separability of individual material fractions is the key to sorting and processing the materials so that the fibres from the used textiles can be reused as raw material for the production of new textile products. A precondition is that the design of the textiles is suitable for this. Currently, this is only the case for certain product groups. Therefore, the entire production chain is challenged to find solutions that enable the recycling industry to return the fibres to the material cycle after use.

4.3 The use of used fibres

A further aspect is the use of secondary raw materials obtained from used textiles after the reprocessing processes. It is up to the manufacturers to make the necessary changes in production and design for this purpose. In particular, the aim is to reuse the used fibres as raw material in the production of textiles.

To this end, corresponding goals and concrete targets must be formulated. The Netherlands is one of the pioneers in this aspect: by 2025, a total of 25% of recycled fibres shall be re-used in new products.



4.4 Drivers for the needed change

Generally, there are different drivers that can lead to change in an industry:

1. The market regulates the necessary changes:

Since the change in production, processing, recycling, development and the interaction of the stakeholders involved require a significant increase in costs and coordination in the organisation between producers and recyclers, the market will not be able to regulate the necessary changes. Today's business models and their processes are no longer suitable for bringing about the necessary change.

2. Voluntary initiatives and commitments:

Since changes entail costs, voluntary initiatives will always be limited to the extent to which individual companies can expect a (possibly long-term) benefit. The risk of losing money is high, as the individual market participants compete with each other. Voluntary initiatives are therefore very suitable for gaining experience and knowledge through individual pilot projects, but according to current estimates would not lead to any real change in the affected sectors. In many cases, marketing interests are the main focus.

3. Statutory regulations:

Within the framework of competition, it must be ensured that all companies have to fulfil the same requirements and obligations, as for the foreseeable future the primary raw material will continue to be cheaper than the secondary raw material obtained from used textiles. This requires political decisions and legal regulations. An extended producer responsibility scheme can be a way to solve the problem. The introduction and implementation of a corresponding system at national level requires a legal regulation with a concrete and interpretation-free description of the obligated parties and their obligations.

4. Municipal fees:

Municipal waste fees are monetary payments for a specific service in return. The municipal regulations determine which waste producer has to pay which amounts for which service. It is not possible to control the design of products that are to be handed over to a municipality as waste. Similarly, specifications for the use of recycled fibres are not possible within the framework of municipal charges. Moreover, a municipality hardly has any possibilities to specify certain types of recycling. Although financial deficits in the area of waste management can be compensated through municipal charges, a real change that affects the entire stakeholder chain cannot be achieved through municipal fees.

5. Extended producer responsibility

For products placed on the market in a country, there is a general producer responsibility. This refers to the supply chain of new textiles and means that manufacturers / importers are responsible for their products in terms of safety, health, social responsibility, working conditions and environmental compatibility. Extended producer responsibility extends this concept and concerns the entire stakeholder chain from raw material extraction through production and use to the post-use phase. By means of legal regulations of extended producer responsibility, specifications can be made for various elements. This applies, for example, to the design of recyclable products, the use of recycled fibres, specific quotas for reuse and recycling, requirements for collection and sorting, as well as the certification of facilities and processes and the corresponding monitoring. Thus, there is a direct link between the fees and the quantities of used textiles that are generated as waste in Germany. The amounts should close the gap for the additional effort required for high-quality recycling. A shift can be achieved through a scheme for extended producer responsibility for textiles, as the obligations affect all stakeholders in the chain. However, this is only the case if the corresponding measures are specified in this law.

4.5 Results from various studies and statements

Through research projects in Germany and in various other European countries, it has been investigated which measures can best achieve the goals of a sustainable circular economy for textiles and thereby achieve a change in the way used textiles are handled.

Based on a research project in Germany as part of a study by the Umweltbundesamt (UBA):¹⁵

The research participants examined different measures and models on the basis of comparable parameters and concluded that the introduction of extended producer responsibility has the greatest positive effects in relation to the relevant criteria for promoting the textile circular economy and also provides solutions for all identified topic areas. The regulations anchored in the amended KrWG are not sufficient, as municipal systems are primarily designed for collection. The other legal regulations only refer to a partial aspect. Based on experience in other areas, a voluntary commitment is not sufficient to lead to a systemic change. This is why introducing an extended producer responsibility scheme is recommended.

Results from a research project in Sweden:¹⁶

The primary objective of the study was to evaluate measures to foster fibre-to-fibre recycling of textiles. Eight policy objectives were investigated but only a mandatory extended producer responsibility scheme could cover all targets. The table below summarises the possible impacts of a mandatory system for textiles in Sweden:

Table 4: Possible effects of a mandatory system for textiles in Sweden

Policy goals:	No/little impact	Medium positive impact	Large positive impact
Increased collection of used textile products (post-consumer textiles)			X
Increased reuse of used textile products		X	
Increased overall recycling of used textile products			X
Increased fiber-to-fiber recycling of used textile products			X
Prevention of hazardous / unwanted chemicals		X	
Development of technologies for sorting and (fiber-to-fiber) recycling of textiles		X	
Increased transparency of material flows		X	
Improved design for fiber-to-fiber recycling			X

Results from a research project in the Netherlands:¹⁷

The study analyses the status of the Dutch “Mission-oriented Innovation System (MIS)”, which aims to achieve a circular textile sector in the year 2050. The analysis was conducted by researchers at the University of Utrecht and commissioned by the Dutch Ministry of Infrastructure and Water Management.

The employment of recycled fibres from post-consumer textiles is considered to be an important objective. For this a very ambitious agenda is proposed, which is shown in the following figure:

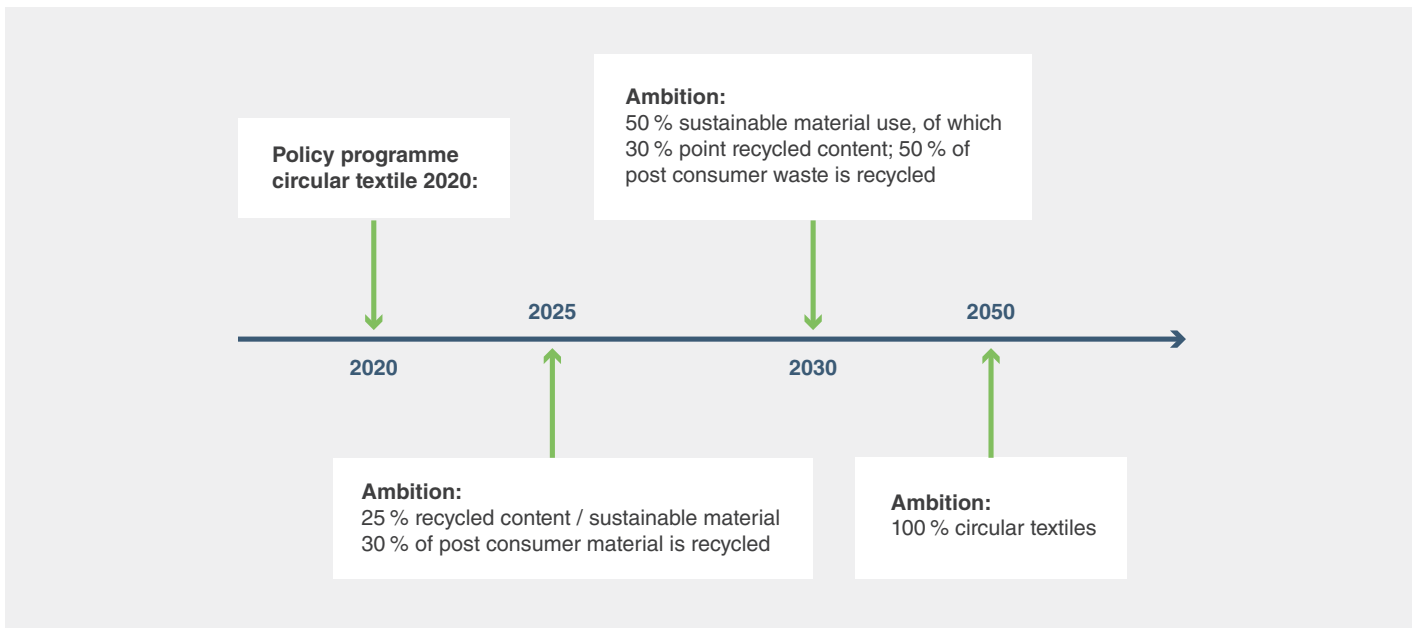


Figure 4: Goals for the use of recycled fibres

For implementation, the research recipients propose to swiftly introduce a mandatory system of extended producer responsibility. This should activate sufficient financial

resources to promote the expansion of innovative activities in the areas of mechanical and chemical recycling and the emergence of new activities based on the KrWG.

From the resolutions of the Umweltministerkonferenz (Conference of Environment Ministers) on 23 April 2021:

The Conference of Environmental Ministers led to the following resolutions: “The Environmental ministers and senators of the states are of the opinion that the recycling of textiles and fibres should be promoted and corresponding markets for recycled and reusable textiles as well as recycled fibres, must be created on a European level. In the light of climate and environmental protection, resource conservation and waste avoidance, they ask the German government to actively advocate for defined producer responsibility in the textiles sector on a European

level as quickly as possible. The entire production chain must be taken into account in order to also improve the production conditions in third countries.

They expect the manufacturers and distributors to develop suitable strategies for the solution of the above-mentioned problems. Therefore, they ask the German government to intensify the dialogue with textile manufacturers against the backdrop of the problems, and to initiate an extended producer responsibility scheme for the textile sector, following the example of other European countries, such as France and Sweden.”

4.6 The need for an extended producer responsibility for textiles

With the principle of extended producer responsibility, (legal) regulations can be made for various elements. This applies, for example, to the design of recyclable goods, the use of recycled fibres, specific quotas for reuse and recycling, requirements for collection and sorting, as well as the certification of facilities and processes and the corresponding monitoring. The regulations on extended producer responsibility for textiles will be laid down in a law or ordinance. The contributions of the distributors of textiles should be based on the consumption of textiles in Germany, i.e. on the textiles that become waste in Germany. There is a direct correlation between the financial contribution and the quantities of used textiles that are accumulated as waste in Germany.

The contributions are intended to close the gap for the additional costs for high-quality recycling. This will be required to recycle the textiles, which will no longer be able to be marketed as used textiles.



A change can be achieved through a regulation on extended producer responsibility for textiles, as the obligations affect all stakeholders in the chain. However, this is only the case if this legislation specifies the necessary actions.

In a joint statement, BDE, bvse, GftZ and NABU argue for an “Extended Producer Responsibility for Textiles”.¹⁸ This was published in December 2020 and provides the basis for discussion with important policymakers in the German government, parliament, the federal states and relevant organisations.

Important elements in the context of extended producer responsibility for the four organisations:

- Goals for reuse
- Goals for recycling of non-marketable and non-wearable used textiles
- Guidelines for the organisation and responsibilities in a new overall system
- Guidelines for documentation and record keeping
- Monitoring and control mechanisms
- Development of a joint communication strategy
- Demands on (further) education
- Demands on funding for research and development
- Funding mechanisms for the additional financing needs for collection, sorting, reuse, recycling, information, communication and control. These form the basis for the realisation of all requirements.

Who is responsible for extended producer responsibility?

Manufacturers / producers who produce clothing, textiles, and footwear in Germany are subject to a German extended producer responsibility, exclusively for their portion, that typically accumulates as waste in Germany after use by the private end consumer.

Distributors who commercially import clothing, textiles, and footwear to Germany are responsible for the portion that typically accumulates as waste after use by private end consumers.

- Only companies that are also registered with an appropriate institution and prove to this registry that and in what way it has assumed extended responsibility for its share, are to bring the aforementioned products on the German market. In France, experience has already been gained with the system of extended producer responsibility for clothing, textiles, and footwear, called Refashion (formerly Eco TLC).
- In Germany, there are already obligations for these companies on the basis of the Packaging Act. For example, all manufacturers and importers who are the first distributor of products in Germany, must participate in a system and register with Zentrale Stelle Verpackungsregister (Central Packaging register), and report their packaging quantities, with all packaging that typically accumulates after use by the private end consumer.
- This register could also be a good basis for a law on extended producer responsibility for textiles and the registration of manufacturers and importers of textiles.



In Germany, individual models must be established for textiles. A transfer of existing laws on extended producer responsibility to the field of textiles is not possible due to the large individual particularities and the already existing infrastructure.

5. Roadmap and strategies within the EU



As part of the Green Deal, the EU Commission has determined various actions to make production and consumption in Europe more sustainable. The resource-intensive production of textiles was identified as a significant industrial sector alongside the construction industry, and a comprehensive strategy for textiles was announced. A published Roadmap illustrates the goals of the initiative, which, as a whole, aims for the transformation of the European textile industry to a circular economy and to increase competitiveness. In this context, the first consultation of various stakeholder groups took place, which ended on 5 February 2021. Over 200 statements were submitted. The GftZ has also participated in the consultation. Furthermore, a public consultation is to be held in the second quarter of 2021. After evaluation of all statements and assessment of the situation, the publication of the EU strategy for textiles is scheduled for the third quarter of 2021. In this context, the Parliament may, among other things, also authorise the EU Commission to adopt implementing acts.¹⁹

The EU strategy is also supposed to include various measures that promote the circular economy such as:

- Eco-design criteria for textiles
- Incentives for and support of new circular business models
- Ensuring a high quantity of separately collected used textiles as of 2025
- Improving the sorting, reuse and recycling of textiles through innovations


The Waste Framework Directive (RL 2008/98/EC), which came into force in 2018, already contains regulations for textiles that support the above-mentioned measures:

- As of 2025, textiles are to be collected separately. The member states were required to implement this regulation into national law by 5 July 2020.
- By 2024, targets for preparation for reuse and recycling are to be evaluated, including textiles.

In addition, minimum criteria for the implementation of extended producer responsibility were determined, which are also relevant for textiles. It was also stated in the roadmap, that the role of extended producer responsibility is considered in the implementation of the above-mentioned measures.

So far, however, extended producer responsibility for textiles and footwear only exists in France.

Extended producer responsibility for textiles in France

 Since 2007, the policy in France is that any manufacturer or importer who imports clothing, home textiles or footwear into the French market to sell them must either:

- set up its own internal collection and recycling program, which has been approved by the French authorities
- or transfer the obligation to an officially authorised take-back system (by signing an agreement) in order to meet the goals of the circular economy.

Eco TLC was founded in 2008 as a non-profit organisation which is run by a board consisting of a total of 29 manufacturers and distributors and three associations today. The permit is generally issued for 5 years. In 2019, Eco TLC, which recently changed its name to Refashion, received a permit for a further three years until 2022. The goals for this period were defined as follows:

Further improvement of the collection, sorting and recycling of used textiles especially by:

- Ensuring a voluntary collection structure with a density of one collection site per 1,500 inhabitants
- Increase of collected used textiles to 300,000 tons (4.6 kg per inhabitant and year), which corresponds to 50% of the products put on the market
- Used textiles must be reused and recycled by at least 95% and a maximum of 2% may be brought to disposal

Refashion is the only authorised take-back system and represents approximately 93% of the companies of the industry.²⁰ For the realisation of the aforementioned goals, five main tasks have been identified:

- Coordination of nationwide collection and sorting
- Sorting according to the 5- step waste hierarchy
- Transparent processes and costs
- Communication
- Research & development

For the current permit, the focus will be particularly on the promotion of innovations, the eco-designs and the labelling of environmentally friendly products, but also on the use of recycled fibres from used textiles. For the execution of these tasks, annual contributions are collected from the obliged companies, based on the number of articles placed on the market. The contribution calculations are based on various parameters, such as the size of the company, the articles and their size, as well as eco-design criteria.

In Germany, there have so far been no specific waste legal regulations with regard to used textiles. In the revision of the KrWG in October 2020, regulations for used textiles were included for the first time, which meet the requirements of the Waste Framework Directive 2018 with regard to the separate collection of textiles.

In order to reduce expenses, companies that have a net turnover of less than EUR 750,000, or bring less than 5,000 articles onto the market per year, are eligible for payment of a small flat-rate contribution.

Another point is the promotion of products that have been produced according to eco-design criteria. Sustainable products and the use of recycled fibres from textiles or footwear made from used textiles or production waste are rewarded with a reduced contribution.

Implementation of the Waste Framework Directive in Germany



The implementation was carried out in a 1:1 ratio with the consequence that the ÖRE (public waste management authorities) are responsible for the separate collection of textiles from 2025 on. There are no more specific requirements with regard to collection or recycling goals for textiles. Industry associations complain, however, that these regulations are not sufficient to keep up with developments in the used textiles sector, as well as with regard to environmentally friendly production and sustainable consumption.

Other countries in the EU have taken an in-depth look at the future challenges and have made further progress in the implementation of the Waste Framework Directive.

Implementation of the Waste Framework Directive in other countries



The Netherlands

The government has decided to introduce the extended producer responsibility for textiles, detailed information regarding the implementation is not available yet. The Ministry of Infrastructure and Water Management published a directive program on 14 April 2020 for textile circular economy for the period of 2020-2025. This already sets some concrete goals for the use of recycled fibres and for the recycling of used textiles:

From 2025, the proportion of recycled fibres or sustainable materials should be at least 25% for textiles placed on the market, 30% of which is to be recycled, provided that it is no longer wearable or usable. The quota of sustainable materials in textiles will increase to 50% in 2030, of which at least 30% of which must be made from recycled fibres and the recycling quota increases to 50%.

The extended producer responsibility scheme is to be implemented in the Netherlands as of 2023.



Bulgaria

The introduction of an extended producer responsibility scheme has already been decided and is to start on 1 July 2021. For this purpose, all producers and importers of clothing, home textiles and footwear are obliged to register and report quantities. The start of operational implementation is scheduled for 2022; detailed information on the frameworks has not yet been published.



Sweden

In December 2020, the Swedish Government has published a draft law to introduce extended producer responsibility for textiles. This law is to come into force on 1 January 2022, with operational implementation starting in 2024. Based on a residual waste analysis in 2022, the measures are intended to reduce the share of textiles contained in residual waste by 70% in 2028, 80% in 2032 and by 90% in 2036. Furthermore, by 2028 at the latest, all used textiles collected are to be 90% reused or recycled.

Manufacturers and importers of textile products such as clothing, hometextiles and bags must participate in an accredited take-back system.

There are different approval conditions for the take-back system, such as the establishment of nationwide free-of-charge accessible collection points. The collection points are to be set up for each municipality in relation to the population density. The existing structures of non-profit and commercial as well as municipal collections should be taken into account. With the exception of non-profit collection, all others must hand over the collected quantities and are compensated for the collection service. In addition, there are further requirements such as the obligation to provide information to consumers, local authorities and producers, as well as reporting and producers, but also obligations to report on the implementation of the tasks and the volume trends.

It remains to be seen whether the draft law will be approved in the committees or whether it will have to be amended.



Spain

The draft of the Spanish Waste Act also forms the basis for the introduction of extended producer responsibility for textiles.

The region of Catalonia has already dealt intensively with this topic in the interregional project CircE²¹, which was launched in 2017. The government of the region is currently working on the foundations for voluntary agreements by the industry. These are to form the basis for the establishment of a pilot region for extended producer responsibility.



United Kingdom (former EU)

The environmental review committee of the House of Commons published the report “Fixing Fashion” in 2019 which, among other things, assesses the environmental impact and waste problem of rising fashion consumption. It proposes that a legislative framework should be developed. DEFRA, the Department for Environment, Food, and Rural Affairs, has published the new waste management plan in 2021 in which the extension of the extended producer responsibility to additional five waste streams, including textiles (these include clothing, home textiles and commercially used textiles, such as bed sheets etc.) will be considered. In April 2021, a new voluntary agreement called Textiles 2023 was initiated by WRAP, which is building on the experience of the Action Plan for Sustainable Clothing (SCAP 2020) and aims to involve the majority of British fashion and textile organisations in joint climate protection measures.²²

Other countries

In addition, some countries have brought forward the introduction of compulsory separate data collection. For example, Denmark and Italy are ready to start in 2022, and Finland will introduce it in 2023.

Based on these decisions, it can be expected that collection volumes in Europe will increase much sooner which, without an immediate expansion of the sorting and recycling infrastructure, will lead to acceptance problems.

Conclusion

In many countries, new ways are being explored for the production, use and handling of textiles after use. The necessity of rethinking and determining new responsibilities for the use of textiles must be given much greater focus by politicians and all stakeholders. A change is inevitable and can only be reached with clear legal regulations, new forms of organisations, investments and changes in the design of textiles.

Appendix

Table 4: Overview of textile recycling initiatives / companies and technologies²³

Name	Technologie	Input	Output	Description
Altex Germany	Mechanical	Industrial textiles, home textiles, clothes. All textile materials.	Fibres useable for insulation, automotive industry, geotextiles and drainage	Textiles are torn by needle rollers pulling in opposite directions.
Amber Cycle USA	Chemical	Polyester and poly-cotton blends.	Pellets useable for yarn and fabrics.	Pilot plant where genetically modified microbes that consume PET are used to separate polyester from other textile fibres. The products are then used to produce new PET pellets and polyester fibres.
Antex Spain	Mechanical	Post-industrial polyester and other synthetic fibres.	Yarn for the clothing or automotive industry.	Currently at pilot scale recycling post-industrial textile waste into new yarns.
Aquafil Italy	Chemical	Nylon from fishing nets and carpets.	Different kinds of clothing and mats made from new clothing and carpet yarn.	Nylon is broken down from polymer to monomer in a chemical process. The products are then melted and extruded through a spinneret to create a thread which is then stretched into a fibre. The fibres then thereafter be spun to yarn and woven.
Artistic Fabric and Garment Industries Pakistan	Mechanical	Post-industrial and post-consumer denim cotton.	Fabric for new denim cotton.	The current capacity is 60 million metres of fabric and 25 million garments / year.
Cardato Italy	Mechanical	Wool, cashmere and wool-polyester and wool-polyamide blends.	Yarn or fabric for new clothing,	Processes 700 tons a year.
European Spinning Group Belgium	Mechanical	Cotton, denim and polyester.	Yarn for different applications	Post-consumer textiles are made into blends for denim, towels, tents and workwear on different colours.
Infinited Fiber Finland	Chemical	Cotton	Yarns for fabrics and clothing	Chemical cotton recycling method applicable to existing viscose and pulp factories. It is a three-step method where fibres are separated, turned into liquid and then processed into new fibres.
Ioncell Finland	Chemical	Cotton and cellulose-based materials	Cotton-like yarn for fabrics and clothing	Cellulose from recycled cotton fabrics and other sources can be dissolved using ionic liquid to extract hemicellulose fibres which can be spun into new yarn using dry-jet wet spinning.
Ioniqa Netherlands	Chemical	Polyester	Pellets for clothing	Currently in the pilot phase where 10.000 tons of PET from food packaging is processed annually.
Refibra Austria	Chemical	Pre- and post-consumer cotton waste.	Yarn for fabrics and clothing.	Cellulose from recycled cotton is dissolved using an organic solvent, then mixed with recycled Loycell pulp and processed into new fibres.
Re:Mix Sweden	Thermal	Textiles containing elastane, requirements of purity are not yet determined.	Elastane yarn.	A thermomechanical technique to separate elastane from other textile fibers is being developed. Through this method, raw material pellets can be extracted which can be used to produce new thread through injection molding.
Re:newcell Sweden	Chemical	Cotton and viscose	Pulp that can be made into yarn for fabrics and clothing.	A chemical method where textiles are turned into a slurry. Contaminants are removed from the slurry, thereafter the slurry is dried and turned into bales of pulp.
Re-verso Italy	Mechanical	Only 100% wool garments can be processed.	100% wool and cashmere yarns.	Pre-and post-consumer wool is washed, shredded and spun into new yarn.
SaXcell Netherlands	Chemical	Pure cotton.	Fibres for yarn and clothing.	Cotton textile waste is ground, chemically decolourized and wet-spun into new yarn. Building a plant in 2020 that can process 10.000 tons a year.
Södra Cell Sweden	Chemical	Cotton and poly-cotton blends	Pulp for yarn, fabrics and clothing	Method in which the cellulosic content of textiles are recovered. Long-term target is an annual capacity of 25.000 tons.
Wolkat Netherlands	Mechanical	All natural and synthetic material textiles.	Textiles with 65-95% recycled fibre content.	Post-consumer textiles are sorted after colour and material, then mechanically processed into fibres that are either spun and woven into fabric or used in non-woven products. Has a capacity of 30.000 tons a year.
Worn Again UK	Chemical	Cotton, polyester and poly-cotton. Up to 20% of contaminants can be filtered out.	PET resin and cellulosic pulp for yarn, fabrics and clothing.	A closed looped solvent system separating cotton and polymers. Plant expected to open in 2021.

References

1. European Commission; "Research into circular economy perspectives in the management of textile products and textile waste in the European Union; Interim Report, A.R. Köhler, D. Watson, C. Löw, R. Liu , J. Dannek, 2020
2. Roadmap "EU strategy for Textiles": <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12822-EU-strategy-for-sustainable-textiles>; (03.03.2021)
3. Working paper of the Länder Baden-Württemberg (BW), North Rhine-Westphalia (NW), Saxony (SN): "Anforderungen an die Erfassung, Sortierung und Verwertung von Alttextilien - Vollzugshilfe und praktische Empfehlungen für Ausschreibungen" Final Draft; 11/2019
4. Nicole Kösegi and Jörg Wagner. Expert discussion on the research project of the German Federal Environmental Agency (Umweltbundesamt) "Evaluierung der Erfassung und Verwertung ausgewählter Abfallströme zur Fortentwicklung der Kreislaufwirtschaft", 09.11.2020
5. See 4.
6. bvse, Fachverband Textilrecycling: "Bedarf, Konsum und Wiederverwendung von Bekleidung und Textilien in Deutschland", 2020
7. European Commission; "Research into circular economy perspectives in the management of textile products and textile waste in the European Union; Interim Report, A.R. Köhler, D. Watson, C. Löw, R. Liu , J. Dannek, 2020
8. Ellen MacArthur Foundation: A New Textiles Economy: Redesigning fashion's future. Online available under <https://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashions-future>, (04.05.2020)
9. See 7.
10. Act on the Promotion of Closed Substance Cycle Waste Management and Ensuring Environmentally Compatible Waste Management (Gesetz zur Förderung der Kreislaufwirtschaft und Sicherung der umweltverträglichen Bewirtschaftung von Abfällen - Kreislaufwirtschaftsgesetz), § 20 Para. 2 No. 6, 2020
11. <https://www.ellenmacarthurfoundation.org/news/a-new-textiles-economy-redesigning-fashions-future-download-the-report-infographics>, (21.04.2021)
12. https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy_Full-Report_Updated_1-12-17.pdf, (21.04.2021)
13. Dr.-Ing. Joachim Harder, OneStone Consulting Ltd., Varna/Bulgaria (2019) Die Grenzen des Textilrecyclings. Recovery, 4/2019. von https://www.recovery-worldwide.com/de/artikel/die-grenzen-des-textilrecyclings_3411755.html (08.04.2021)
14. Greenpeace (2017), Konsumkollaps durch Fast Fashion. https://greenwire.greenpeace.de/system/files/2019-04/s01951_greenpeace_report_konsumkollaps_fast_fashion.pdf, zit. nach McKinsey & Company (2016), Style that's sustainable: A new fast-fashion formula. Von Nathalie Remy, Eveline Speelman, and Steven Swartz, October 2016 (08.04.2021)
15. See 4.
16. Maria Elander, Naoko Tojo, Haben Tekie, Magnus Hennlock, Impact assessment of policies promoting fiber-to-fiber recycling of textiles, 2017
17. Transition to Circular Textiles in the Netherlands - An innovation systems analysis; Prof. Dr. Marko Hekkert, Denise Reike MSc., Dr. Anne Rainville, Dr. Simona Negro; Copernicus Institute of Sustainable Development, Utrecht University 2021
18. BDE, bvse, GfZ, NABU: Notwendigkeit einer "Erweiterten Herstellerverantwortung für Textilien", Berlin, Bonn, 12/2020
19. <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12822-EU-strategy-for-sustainable-textiles> (06.05.2021)
20. <https://www.ecotlc.fr> (22.05.2019)
21. <https://www.interregeurope.eu/circe/>(12.05.2021)
22. <https://wrap.org.uk/taking-action/textiles/initiatives/textiles-2030> (05.05.2021)
23. See 7.



Jean Bilsheim Textil GmbH is a company with the know-how to solve the waste disposal problems of today's world. As a certified waste management company, the organisation has extensive expertise and long-standing experience.



For more than 100 years, **BoerGroup** has been collecting, sorting and preparing used textiles for reuse. In 3 collection and 7 sorting companies, 750 employees recycle more than 110 million kg of textiles per year. With Europe-wide cooperations, the **BoerGroup** is continuously developing recycling solutions to conserve resources.



For over 30 years, **Geo-Tex** has been a professional service provider in all areas of collection, processing, marketing and disposal of textiles.



Hahn Putzlappen GmbH is a certified specialist company that has been handcrafting cleaning rags for over 30 years from used laundry textiles that are no longer fit for wear, with satisfied customers in industry and trade. This is environmental protection for this and future generations.



SOEX GROUP is a global service provider for a textile circular economy. With locations in five countries and more than 1,000 employees, the **SOEX GROUP** covers the entire value chain of used textile collection, marketing, recycling and recovery.



TEXAID is one of the leading companies for the collection, sorting and recycling of used textiles in Europe as well as worldwide. Every day, more than 1,200 employees contribute to the reuse of one million pieces of clothing to a new use, thus conserving resources.



The **TRD Group**, with its certified and modern Dutch sorting facilities as well as its service and logistics companies in Germany, **TRD** is one of the leading companies in textile recycling and is a partner of municipalities, globally active charitable organisations and textile manufacturers in the European sector.



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