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OF CLOTHING AND
TEXTILES IN GERMANY**



Federal Association for Secondary
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Textile Recycling

Textile Study 2020

German Federal Association for Secondary Raw Materials and Waste Management
(bvse e.V.)

“Demand, Consumption, Reuse and Recycling of Clothing and Textiles in Germany”

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The contents of this study are based on a member survey presented by the bvse-Specialist Association for Textile Recycling and interviews with member-company officials thereof as well as cooperation with the working group “High-Quality Textile Recycling.”

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Contents

1	Introduction.....	5
2	Abstract	6
3	Quantity Calculations	7
3.1	Actual Collection Quantities - absolute.....	7
3.2	Actual Collection Quantities - per inhabitant per year	9
4	Textile Market Indicators	10
4.1	Fast Fashion.....	10
4.2	Internet und C2C circulation of goods	12
5	Sector Indicators	14
5.1	Quality	14
5.2	Recycling Options.....	16
6	Conclusion	18
	List of references.....	20

List of Abbreviations

ACQ	Actual Collection Quantities
bvse e.V.	Bundesverband Sekundärrohstoffe und Entsorgung e.V. (German Federal Registered Association for Secondary Raw Materials and Waste Management)
C2C	Consumer-to-Consumer
EUWID	Europäischer Wirtschaftsdienst GmbH (European Economic Service)
kg	Kilogramm
KrWG	Kreislaufwirtschaftsgesetz (German Closed Substance Cycle and Waste Management Act)
LLC	Company with limited liability
SEK	Swedish Krona
SF	Substitute Fuel
t	Metric tonnes

1 Introduction

The textile research study from 2015, compiled by the German Federal Association for Secondary Raw Materials and Waste Management (bvse e.V.), recorded key figures, framework conditions and trends in the light of the amendments to the implementation of the German Closed Substance Cycle and Waste Management Act (KrWG) of 01.06.2012. Example comparisons were made to the results of the bvse-study in 2008 and the general mood in relation to the amended framework conditions was recorded. Following on from the study presented in 2015, this study will again reflect upon fundamental developments, whereby progressive phenomena will be observed, qualified and quantified, based on the knowledge (other than in a few exceptions) obtained from the completed financial year 2018. In addition, current developments will be discussed in the analysis.

In the light of the significance of fast fashion and the internet and their associated difficulties when considering closed substance cycles and compliance with waste hierarchy according to KrWG, the already observed tendency towards increasingly more difficult economic conditions for general textile recycling and for high-quality textile recycling, in particular, will become apparent. This situation will be analysed and conclusions drawn that are not only economically relevant, but also allow a critical analysis of the notion of circular economy in society as a whole. Furthermore, it will become apparent, how significant established textile recycling structures are, and which challenges these structures face regarding textile product manufacturing methods, consumer behaviour and reformed legal frameworks.

Initially, to enable scientific evaluation, domestic availability and actual collection quantities in 2015 and 2018 will be calculated, whereby specific features, common features and differences to previous calculations will be explained and justified. The calculated values will be interpreted using current explanatory approaches and, subsequently, the market outlook for the coming years will be critically analysed.

2 Abstract

Consumer behaviour regarding textiles has fundamentally changed in recent years. The once longer use of shoes, clothing and household textiles has given way to an increasingly rapid consumption thereof. Alone in the period between 2015 and 2018 an average increase of collected textiles of 2.2 % to 15.3 kg per inhabitant per year was seen; this represents an increase of actual collection quantities during this period of over 90,000 tonnes, thus reaching a total of 1,271,242 tonnes during 2018. The majority of this increase can be attributed to imported textiles from low-wage countries, so much so that the German textile industry is becoming increasingly less significant.

The increase in available collection quantities suggests an improved market situation for textile recycling. However, the opposite effect is observed, as an increase in quantity of the originally collected textiles does not necessarily correspond to an increase in quality thereof. Cost pressure on producers, increasing market shares of fast fashion and private circulation of goods, a contaminant and impurity ratio of 10.8 % before sorting as well as a doubling of the ratio of textiles no longer suitable for recycling are representative of a rapid reduction in quality, which coupled with the overall increase in the original collection quantities has recently manifested itself in a slump in prices to under € 200/t for originally collected textiles. At first glance, this appears to be counteracted by the increase in the reuse ratio at the recycling plants, from 54 % in 2015 to 62 % in 2018. However, this should be viewed from an economic standpoint, where the best possible added value achieved by increasing both specialisation and hand-sorting needs to be considered; the latter of which still cannot be technically automated in a competitively viable manner. This last point is particularly critical for Germany in the light of developments on the labour market regarding workforce costs.

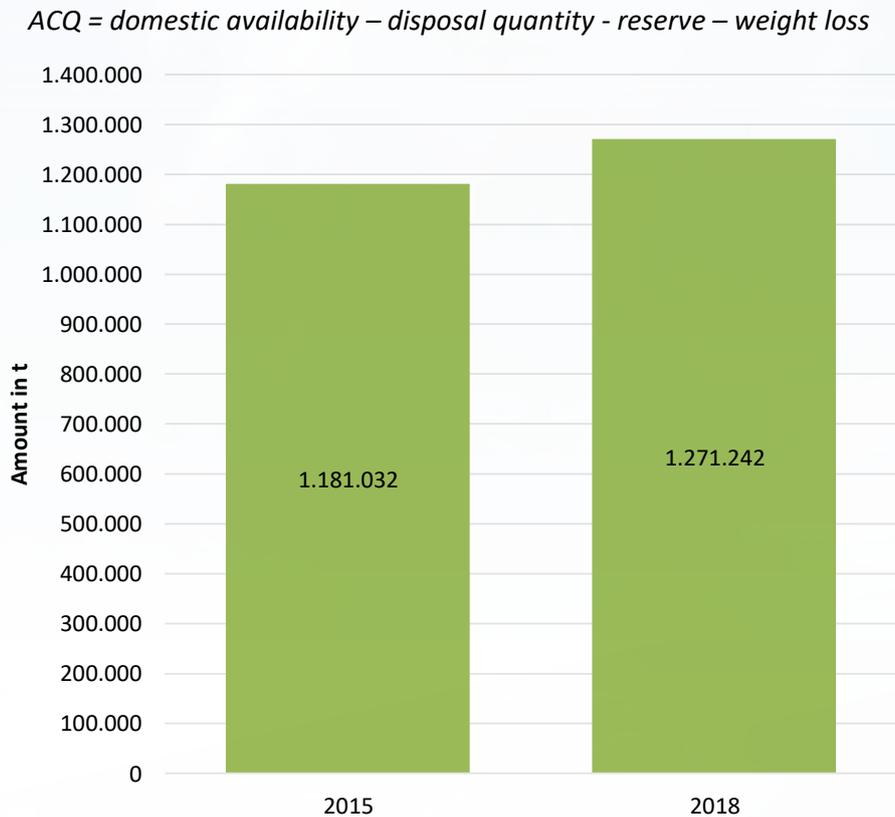
Textile recycling must, and will, adapt in coming years; on this point there is complete consensus amongst those players involved in the textile circular economy. However, there is discord as to the manner and method of the transition and where the responsibility lies for the implementation thereof. The figures presented in this study can be seen as a call on all participants to overcome differences regarding the problems involved in textile recycling, and, now more than ever, to work together to develop a sustainable, but also fair concept for the future to ensure that high-quality textile recycling survives within the framework of the German Closed Substance Cycle and Waste Management Act. Ultimately, only in this manner is it possible to even meet, let alone with efficiency, the social demands for future sustainability.

3 Quantity Calculations

3.1 Actual Collection Quantities - absolute

The same formula which was used in the bvse - Textile Study 2015 for the calculation of actual collection quantities as well as for the reserve and weight loss quantities is applied. There is, without doubt, the need to revise these values or provide an up-to-date analysis to verify their validity for future studies. Data is collected from the current waste balance sheet for each individual federal state and subsequently analysed to obtain disposal quantities. Data validity could not be verified, due to differing reference years (2016 - 2018) of each individual federal state's waste balance figures, the failure in some cases to separate textiles from domestic waste, the differing types of textiles and their collection methods as well as missing reports from the administrative districts within each federal state and in the federal state comparison. Feedback to enquiries on this topic revealed that the lack of uniformity in the collection and presentation of the differing waste ratios in the total waste collection quantities were responsible for the, in parts, inferior data base. Admittedly, there are endeavours to implement structures in the near future for the separate collection of textile waste to meet the new regulations coming into force in 2025, but progress at the moment is not yet deemed to be sufficient. Uniformity in the collection and presentation of differing textile ratios in the collected residential waste is urgently required, so that valid quantities and reference values for textile waste ratios and suchlike can be generated. For these reasons, the disposal value used in 2015 of 3 kg per inhabitant per year is once again used in the following calculations, even though a different value could de facto be assumed.

It is evident that both the previous and current study indicate identical developments. In 2015, compared to the 2008 study, an increase in collection quantities was revealed. This corresponds with the comparison of the figures from 2015 and 2018.



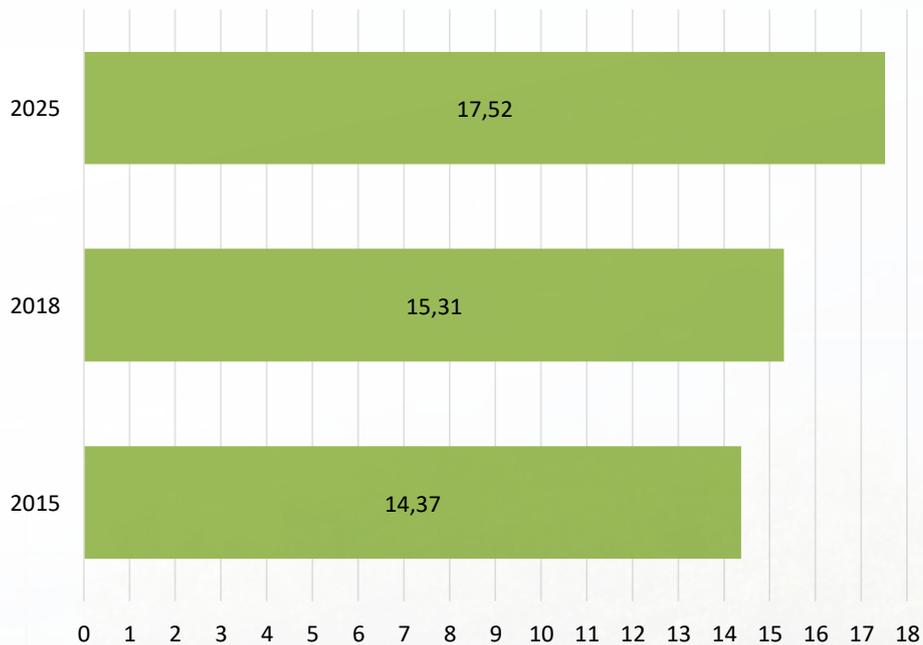
According to recent calculations, the absolute quantity of actual available textiles for collection has increased by 90.210 tonnes between 2015 and 2018 in Germany. Compared to 2015, domestic production has increased by 6.5 %, whilst the proportion of foreign trade has increased by 8 %. The trend towards imported clothing still continues, whilst German domestic clothing and household textile production is steadily decreasing. Furthermore, following the method used in the 2008 and 2015 studies to calculate actual collection quantities, an increase in available absolute collection quantities and an increase in per inhabitant per year quantities are revealed - the latter being particularly relevant in the light of forecasted population growth.

3.2 Actual Collection Quantities - per inhabitant per year

For the last 3 years, the average annual increase for the actual collection quantities per inhabitant per year is 2.2 %. Alongside the absolute increase in population, higher amounts of waste generated per inhabitant per year is also seen. The absolute increase between 2015 and 2018 amounts to 0.94 kg per inhabitant per year; this means that with an average weight of 0.3 kg per piece of clothing or household textile and 0.6 kg per pair of shoes, approximately 3 more pieces of clothing/household textiles or 1.5 more pairs of shoes are being disposed of by every inhabitant compared to 2015.

According to the German Federal Statistical Office (Destatis), the population of Germany, when considering the average of all calculation methods, is expected to reach 83,723,470 by 2025. Based on the average linear increase of actual collection quantities of 2.2 % per inhabitant per year, an increase in collection quantities of 2.21 kg per inhabitant is anticipated in 2025.

Actual collection quantities - per Inhabitant per year in kg



4 Textile Market Indicators

4.1 Fast Fashion

Feedback effects and explanatory correlation for the above calculated figures should be seen in the context of the fast fashion phenomenon. This describes a business model in the textile trade, in which fashion collections are constantly being changed and the time taken for the newest catwalk designs to become mass-produced clothing on the shop floor is greatly reduced. Zara now introduces up to 24 new collections and H&M as many as 16 new collections per year. According to Statista, approximately 4.7 billion pieces of clothing were turned over in 2018 in Germany; this represents an increase of 183,700 individual items, compared to 2015.

Meanwhile, all large fast fashion retailers and textile discounters are ambitiously expanding. For example, by the end of 2018 Germany's largest textile discounter, KiK, registered an annual turnover of almost € 1.45 billion in its 2,607 branches; compared to the financial year 2015, this represents an increase in turnover of € 70 million (5.1 %) and an increase in the number of branches by 66 throughout Germany. According to Primark's annual financial report last year, their total turnover was almost £ 7.48 billion Europe-wide. Unfortunately, their annual financial report does not include any figures that explicitly refer to turnover on the German market. The specialist magazine *Textilwirtschaft* (Textile Economy) estimates that Primark's turnover on the German market was € 776 in 2015 and € 800 in 2018. Worthy of note is that from the 16 new branches opened Europe-wide during 2018, 5 of them alone were located in Germany, which in total represents a sum of 27 branches in Germany for the financial year 2017/2018. Especially as the first store was only opened in 2009 in Bremen, this reveals a very rapid development on the German domestic market. As far as H&M is concerned, a slight reduction in gross turnover on the German market is shown, from 36.94 billion SEK in 2015 down to 36.79 billion SEK in 2017, whereby during the same period an increase in the number of branches from 449 to 463 is shown. Noteworthy is the fact that in comparison with their international market, H&M turned over their largest sales volume on the German market - in 2017 their turnover on the German market was larger than their turnover on the French, Spanish and UK markets combined, where an aggregate gross revenue of € 36.38 billion was generated. Unfortunately, Inditex S.A., the parent company of Zara, Pull&Bear etc., also provides no explicit figures for the German market. Their nett turnover increase Europe-wide is stated at € 3.1 billion between 2015 and 2018. *Textilwirtschaft* estimates that turnover on the German market was € 781 million in 2015 and € 1 billion in 2018.

In view of the general increase in turnover volume and branch numbers occasional sales slumps can be disregarded, especially as financial indicators are influenced by other factors, such as exchange rates; however, a detailed analysis of these factors is beyond the scope of this study. The turnover values serve to present and order the markets with regard to dimension and relation to one another. The highly competitive market and the presence of low sales prices, in general, allow conclusions to be drawn concerning the quality of the products. Results from a survey of members support the supposition that the declining quality of collected goods can be attributed, in particular, to the increasing numbers of fast fashion suppliers and textile discounters on the market. This also correlates with an increasing use of chemical fibres.

These key figures can be compared to private household consumer spending for clothing and shoes in Germany. It is important to point out that higher expenditure does not necessarily correspond to an increase in purchased quantities, as typically higher expenditure can also point to higher inflation rates, where consumers spend more money for the same quantities. In addition, the increase in absolute consumer spending and the increase in consumer spending per inhabitant per year could also be explained by increased expenditure on more expensive products of higher quality. However, this is in contradiction to the increasing market share by fast fashion and cheap textile suppliers in the textile sector, especially as favourable purchasing prices for the end consumer lead to considerably more incentive to buy in the lower price segments. Furthermore, these assumptions are supported through analysis of the above mentioned figures.

Consumer expenditure per inhabitant per year



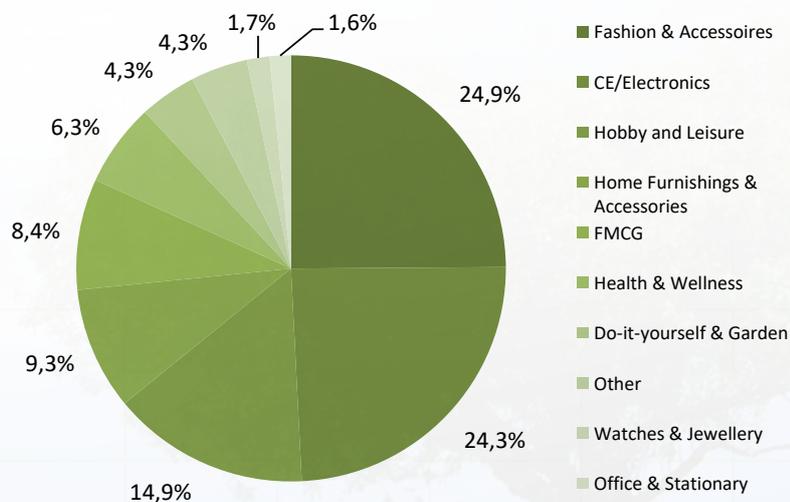
Fast fashion is associated with a chain of causative problems, which are mutually attributed to the other market participants. For example, producers and retailers are always quick to point out consumer demand, whereas others are quick to point out the use of perfidious advertising strategies to create artificial incentive to buy. A survey carried out amongst well-known international textile concerns, such as H&M, Kering, Target, amongst others, revealed that consumers carry the largest responsibility for more sustainability in the textile industry, before shareholders, legislators, NGOs, governments and other organisations with influence. In reverse, this implies that consumers make a major contribution towards respective production conditions. Notwithstanding a clarification of cause for fast fashion, this phenomenon must therefore be seen as a nexus between structures and functional logic of production, turnover and consumption.

4.2 Internet und C2C circulation of goods

The 2015 textile study already mentioned the importance of the internet as a supply source for textiles and, as a consequence thereof, the increase in the availability of private goods. The internet as a trade and turnover platform is still becoming increasingly significant. In 2018, fashion and accessories made up € 13.2 billion of total online trade, albeit compared to 2017 this represents a fall of 0.2 % in relation to total trade. However, the fashion segment, with a 24.9 % market share, held the largest share of the total turnover on the E-commerce market; thus a 0.6% larger share than that of the electronics segment.

Sector share of total e-commerce turnover volume

(own presentation, data source: Onlinemonitor 2019, p. 11, Handelsverband Deutschland - German Retail Trade Association)



As far as the textile recycling sector is concerned, not only are fast fashion, the increase in e-commerce and the associated increase in quantities problematic, but also the general trend towards the skimming off of higher quality textiles before collection, which has come about by the changes in merchandise circulation. C2C business models have now established themselves with a wide degree of consumer acceptance; so that, consumers now have the opportunity to pass on their no longer needed textiles in a more sustainable and lucrative manner, compared to simple disposal thereof. As such, this business model is in line with the aspirations of the KrWG. However, the textile recycling of used textile quantities needs to be considered in its entirety, as although the quantity of private goods sold on is only a small percentage of the total, when seen as a value percentage this amount is not insignificant. Furthermore, it is of great economic significance for the textile recycling industry, as the relatively high proceeds from the higher quality textiles are fundamental to cross-subsidisation within the sector.

When these high-quality quantities are no longer present in the total quantities of the original collected textiles, the cost of handling lower quality goods becomes in effect more expensive, as subsidisation through higher quality goods is lacking; in effect with the absence of higher quality goods the whole handling process of used textiles for recycling becomes more difficult. In association with the fact that the quality of the collected textiles is generally now more inferior due to the issues explained previously, a multi-dimensional worsening of quality can be spoken of. With regard to the above mentioned interdependencies, the up until now gratuitous recycling of high quality textiles is particularly affected. On the one hand, these issues have to be accepted as the status quo for textile recycling. On the other, performance limits of the recycling economy should always be viewed in the light of the origin of the issue and the causative interdependencies thereof. It is obvious, that practical recycling concepts can only make sense if they take these causative factors into account in their implementation. Fast fashion, the internet trading platform and the increasing presence of C2C circulation of used textiles are negatively impacting the already difficult market situation.

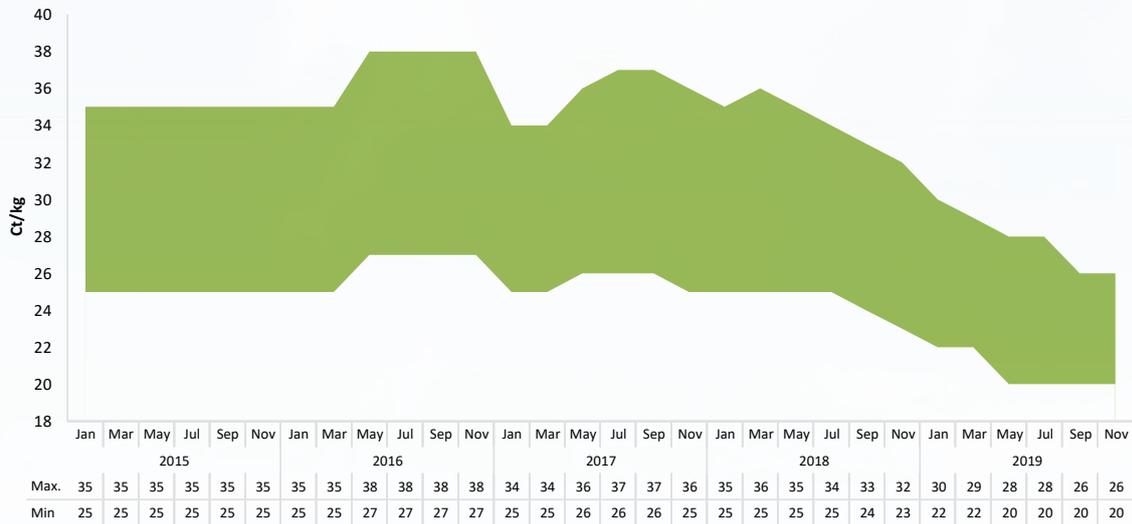
5 Sector Indicators

5.1 Quality

In 2015, quality development was still varied; whereas half of the businesses asked reported that quality had remained stable, the other half reported a decline in quality. A similar split was forecast for quality development in the following year. However, in the 2019 survey 87 % of the participating bvse member companies reported an average decline in quality of approximately 15.6 % since 2012; only 13 % of the participants reported that the quality had remained unchanged. The decline was attributed to the increased percentage of ruined and inferior quality textiles as well as increased quantities of textile waste, and an increased presence of contaminants and/or impurities therein. According to the participating companies involved in the collection of used textiles, the latter made up 10.8 %, of the total collected quantities. As manual evaluation of containers concentrates on the sorting out of contaminants and impurities, further textile waste can only be expected when sorting commences.

The proportion of waste textiles that can no longer be marketed, encountered both at the collection and sorting stage, is becoming increasingly problematic during high-quality sorting. From the middle of 2016 onwards, retailers have been obligated to charge consumers for plastic bags and, according to EUWID, since this came into force considerably more loose textiles are found in the clothing and textile recycling banks, thus increasing the risk of cross-contamination. Consequently, collectors can expect increasing amounts of non-recyclable waste at the point of collection and, according to bvse member companies, disposal costs therefor of up to € 200 per tonne and in some regions even up to € 300 per tonne. The plastic bags that do actually land in the disposal bins/banks can now only be disposed of at a cost or sometimes cannot be marketed at all, so that storage capacity is negatively affected. The situation is further exacerbated by continuing difficulties concerning the marketability of different types of recycling in general. In addition, shortcomings in collection methods lead to further loss in quality and, at times, higher waste ratios per collection. Through the use of unsuitable collection systems, such as bottom-hinged containers, personnel costs may be reduced, albeit at the cost of depreciation in value of the collected textiles due to system-related increased contamination of used textiles. Textile sorters are being forced to come to terms with ever-increasing quantities of inferior quality textiles. Moreover, yet a further increase in waste quantities is plausible, which will cause the same problems for both the collection and sorting of textiles. Admittedly, the price for collected used textiles remained more or less stable between 2015 and 2017; however, a drastic fall in prices has been observed since 2018.

*Price range developments for original collected textiles (in cent/kg)
in Germany 2015 -2019*



This puts pressure on both the collecting and sorting segments, as in order to successfully and economically market textiles, the above-mentioned high-quality share is vital in both the original collected textiles and in the sorted textiles. As a result of the reduction in high-quality textiles in the ever-increasing absolute amount, doubt is now being cast on the cross-subsidisation model for used textiles, per se. This problem is not only apparent in the reuse segment; this is also made clear by the changing ratios and amounts in various other available recycling options.

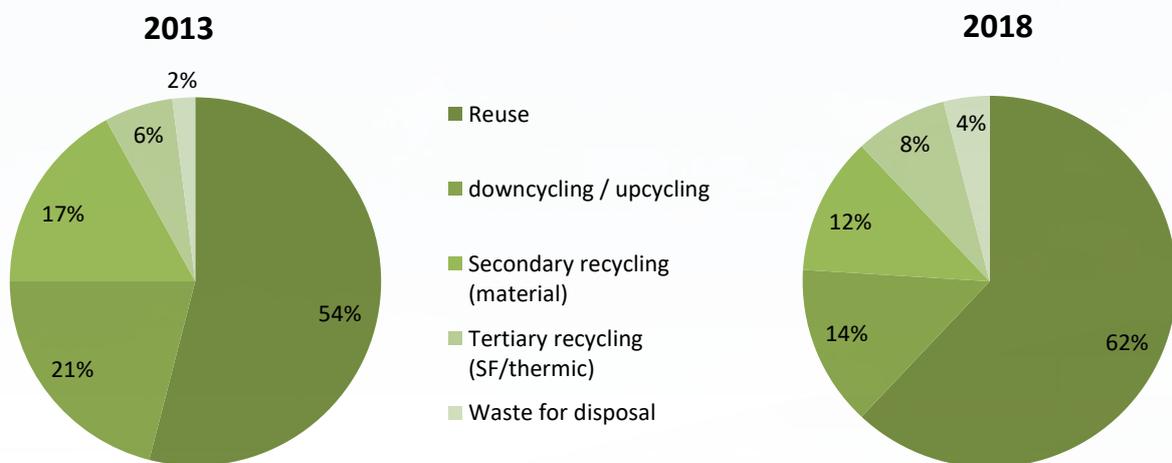
5.2 Recycling Options

As early as 2015 an increase in the proportion of reused textiles was observed and this positive trend continues. In comparison with the figures from the 2015 textile study, the reuse of used textiles increased by 8 % to 810,000 tonnes, representing 62 % of total collection quantities. This can, without doubt, be attributed to recycling expertise, as the development of the reuse ratio is contrary to the general trend of a decline in quality of textile products. Recycling companies are being forced to generate the highest possible return from the collected textiles available. However, this can only be achieved by increasing specialisation and manual sorting expenditure. This, in the end, results in a zero-sum situation, as larger quantities generating lower margins have to be sorted. This in turn necessitates that the highest possible quantities are directed towards reuse, as herein lies the largest economic potential.

In contrast, the proportion of downcycled or upcycled textiles fell by 7 % to the present level of 14 % of the total quantity. The recycling quota has fallen by 20 %, a 3 % reduction on the 2015 figures. Here, the discrepancy between the decrease of 5 % in secondary (material) recycling and the increase of 2 % in thermic (tertiary) recycling is particularly noticeable. The increase in thermic recycling can be partially explained by the increase in the energy value created by the increased use of mainly mineral oil based chemical fibres and by the increase in the ratio of textiles not suitable for further processing, which is coherent with the general reduction in quality, as mentioned above. However, the increase in thermic recycling could also be explained by the fact that material recycling has become increasingly difficult and thus less lucrative. According to the participants asked in the 2018 textile study, material recycling made up only 12 % of the recycled textiles. However, as material recycling is seen as the basis for recycled fibres, this development must be viewed with concern; whereas, according to the 2015 study, material recycling made up 21 % of the actual collected quantities, that is 172,000 tonnes, by 2018 this was down to almost 157,000 tonnes.

The percentage of waste to be disposed of during sorting has doubled since 2015 and now represents 4 % of the total amount. In absolute quantities this means almost 52,000 tonnes, whereas in 2015 only 20,000 tonnes were registered; thus, absolute quantities have more than doubled. In addition, there is the marked increase in the proportion of contaminants and impurities extracted at the time of container emptying, these quantities also need to be added to the actual collection quantities, as this relates explicitly to non-textile materials which have to be disposed of by the recycling companies at their own expense and as such compromise the added net value.

Admittedly, the reuse ratio has increased, however this increase does not correspond with a higher net added value. On the contrary, as explained above, this increase is directly linked to falling margins as a result of inferior quality textiles and the increase in the recycling costs thereof. Alongside the above-mentioned factors, there is also the cost for disposal of the increased proportion of textiles that are no longer directly marketable which also need to be subsidised and covered.



6 Conclusion

Since the 2015 bvse textile study, the general market situation along the whole high-quality recycling chain has worsened. The entrance of public waste management authorities into used textile collections did not have the desired effects, such as a stabilisation or even reduction of waste collection charges. Illegal market participants are increasingly withdrawing from the market, presumably as a result of price inflation. Control and quantification of illegal trading through law enforcement is still complicated, as ongoing workload issues in the responsible administrative bodies are impeding enforcement. Particularly precarious for the economic functional ability of the recycling sector is the increasing market share of textiles from fast fashion suppliers and textile discounters; the associated increased consumption and disposal behaviour of the population; the skimming off of the relevant high-quality goods through the passing on or sale of used textiles by private individuals/companies and, from the sum of the above, the resulting increase in overall collection quantities, especially those of inferior quality.

Meanwhile, the increasingly difficult framework conditions are revealing problematic situations that necessitate consideration from the perspective of society as a whole. Consequently, it is necessary that stakeholders throughout society develop a comprehensive understanding of the issues involved. It follows that responsibilities in relation to the problems concerning refuse and waste will need to be assigned, provided that they do not develop within the functional logic of the free market and, unfortunately, the current picture reveals this to be the case. However, when doing so, it is important that the pressure is not increased on the professional already-established recycling structures, but rather is directed towards those at the root of these issues.

Furthermore, it must be ensured that preconditions are achieved which, in the light of the current forecasts on market development, will enable high-quality textile recycling in Germany in the future. In the first instance, the main focus must be the reuse of textiles, according to the waste hierarchy set out in the KrWG. The proportion of reused textiles in this closed loop cycle will be dependent on the quality and quantity of the collected textiles. The end-of-life scenario for consumer products must also be taken into account, as it will remain an integral part of the recycling environment for the foreseeable future, despite attempts made to make it obsolete by the implementation of a cradle-to-cradle approach. As it is, real closed loop cycles for textile products should be understood more as a perspective, rather than a near term market-ready option, especially in the light of the different types of fibres being used and the recycling potential thereof. Indeed, the increasing use of chemical fibres, as opposed to the more traditional natural fibres (e.g. cotton), theoretically brings with it a larger recycling potential after end-of-use; practically, however, the technical means for efficient fibre recovery are still lacking, especially on a large industrial scale. Even now, the already existing requirements cannot be met, so that theoretically recycling capacities are not yet being

used to their full potential. Furthermore, due to the more complex production and/or recovery process of recycled fibres, they are usually more cost intensive than traditionally produced fibres, which are often the preferred choice in production for this reason. By contrast, thermic recycling can and should only be understood, at most, as the last resort.

Exactly because of and especially with regard to resource conservation and energy efficiency, high-quality textile recycling is highly significant. However, the political demands to increase these two factors and the incentives offered for doing so must be coupled with the political responsibility to ensure compliance with a sustainable economic model. In this respect the demands set out in the KrWG (§33, paragraph 3, sentence 1, point 1) are extremely questionable, as it is not clear how economic growth can be de-coupled from the presented waste agreement when the reuse of textile products is becoming increasingly more difficult, and as far as quantity developments are concerned, the recovery methods for recyclable material cannot be considered market-ready and/or financially viable, at least for the short and middle term. The existing functional interlacing of caritative, municipal and private recycling service providers must be conserved in its present form, as it fundamentally contributes to adherence to the waste hierarchy laid out in the KrWG. However, for this to function as such, protection of the already fragile and crisis-susceptible market is vital, rather than the opening-up thereof. In the light of the ascertained figures, it is already questionable as to how long high-quality textile recycling in general will remain feasible in Germany. Therefore, as a sign for the self-conception of our consumer society before the back drop of ubiquitous slogans, such as the climate crisis, a rejection of the existing model for the reuse of used textiles is neither worthy of support nor credibly justifiable.

All considered, a conflicting situation dependent on a number of factors and circumstances de facto exists, which when viewed from both an ecologic and economic perspective can only be described as problematic. This too makes the continued existence of high-quality textile recycling absolutely essential, in view of the ambitions set out in the KrWG.

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