ETC CE Report 2023/4

EU exports of used textiles in Europe's circular economy

Authors:
ETC experts: Dina Lingås (Norion), Saskia Manshoven (VITO)
EEA experts: Lars Fogh Mortensen, Freja Paulsen

European Environment Agency
European Topic Centre
Circular economy and resource use

Cover design: EEA
Cover image © Lars Fogh Mortensen
Layout: ETC CE

Publication Date 27 February 2023

EEA activity Circular economy and resource use

ETC CE coordinator: Vlaamse Instelling voor Technologisch Onderzoek (VITO)

ETC CE partners: Banson Editorial and Communications Ltd, česká informační agentura životního prostředí (CENIA), Collaborating Centre on Sustainable Consumption and Production (CSCP), Istituto Di Ricerca Sulla Crescita Economica Sostenibile, Istituto Superiore per la Protezione e la Ricerca Ambiantale, IVL Swedish Environmental Research Institute, PlanMiljø, Universita Degli Studi Di Ferrara (SEEDS), German Environment Agency (UBA), Teknologian Tutkimuskeskus VTT oy, Wuppertal Institut für Klima, Umwelt, Energie gGmbH, World Resources Forum Association.

European Topic Centre on
Circular economy and resource use
https://www.eionet.europa.eu/etcs/etc-ce

Content

Acknowledgements

This report has been produced within the task on Textiles and the environment in Europe's circular economy of the 2022 ETC/CE work programme. Lars Mortensen (EEA) and Saskia Manshoven (ETC/CE) were project supervisors, Dina Lingås was the lead author, and Freja Lund Paulsen supported the work.

Thanks to the following experts for providing comments and suggestions in the process:

- Bettina Heller, United Nations Environment Programme's Consumption and Production unit
- Caterina Savelli, European Commission
- Chiel Berends, European Commission
- Daniel Montalvo, European Environment Agency
- Else Skjold, Det Kongelige Akademi
- Gael de Rotalier, European Commission
- Ioannis Bakas, European Environment Agency
- Jana Žůrková, RREUSE
- Julia Blees, EuRIC
- Kimberley van der Wal, Wolkat
- Marie-Jeanne Gaertner, RREUSE
- Maria Luisa Martinez, Global Fashion Agenda
- Michael Laermann, Ecopreneur
- Tanja Gotthardsen, Continual CSR
- Tobias Nielsen, European Environment Agency
- Tom Duhoux, VITO
- Valeria Botta, Ecostandard

Summary and key messages

The export of used textiles from the EU has steadily risen over the last 20 years, from a little more than 550 000 tonnes in 2000, to almost 1.7 million tonnes in 2019 (See figure 1), which translates to an average of 3.8 kilograms (kg) per person in 2019. The value of these exports has, however steadily decreased, from EUR 0.76 in 2000, to EUR 0.57 per kilogram in 2019.

Throughout the last two decades, around 75 % of the total volume of used textiles from the EU have been exported by just five countries. These countries are believed to not only export discarded textiles that have been collected locally, but they import used textiles from the other EU countries, making them *import-export hubs*. Although the five countries have changed slightly over the period, overall Belgium, Germany, Italy, the Netherlands, and Poland, are the hubs responsible for most of the exports.

At the beginning of the period, Africa imported almost 2/3rds (63 %) of the used textiles exported from the EU. Although Asia was always the second largest importer, the continent has significantly increased its share during the period. In 2019, Asia had increased its imports by the same amount as Africa had reduced theirs, with Asia importing 41 % and Africa 46 % of the used textiles exported from the EU.

Imports to Asia primarily go to economic zones where the textiles are mostly recycled rather than sent for reuse locally or are re-exported to other Asian or African countries. The imports to Africa, on the other hand, are intended for reuse, although about 40 % ends up in landfills (Ahiable and Triki, 2021; Ricketts and Skinner, 2019). This division is not reflected in the commodity codes used for the export of used textiles, as a very small part of the exports are classified as intended for recycling.

As the share of exports going to Asia, where most is recycled, is growing, the used textiles exported from the EU seem to have increasingly ended up as industrial wipes and rags. It is unclear why this happens, and therefore more research is needed to better understand the quality of what is exported. Of the exports to Africa, a portion of the textiles are reused, but a significant amount ends up in either legal or illegal landfills, causing environmental problems. In other words, the textiles collected in and export from the EU are commodities, not charity. Textiles may be donated to charities, but they are commonly traded for profit rather than donated directly to individuals in need (Watson et al., 2016), and, indeed, the outcome is not necessarily perceived as charitable by the textile receiving countries. It is, however, hard to precisely pin down the exact fate of the used textiles. There is still a lock of transparency around the global used-textiles industry which is complex, connected, and inadequately reported on.

1. Introduction

The European Environment Agency (EEA) has published a range of reports and briefings on textiles since 2019 to improve knowledge about and raise awareness of their environmental impact. For instance, the EEA in collaboration with its Topic Centre on Circular Economy and Resource Use (ETC/CE), has published briefings and reports on textiles and the environment in a circular economy (EEA, 2019; ETC/WMGE, 2019), circular design of textiles (EEA, 2022b; ETC/CE, 2022b) and circular business models related to textiles (EEA, 2021a; ETC/WMGE, 2021a), as well as briefings and reports on the use of plastics in textiles (EEA, 2021b; ETC/WMGE, 2021b) and the impact of microplastics from textiles (EEA, 2022a; ETC/CE, 2022a). Together, these reports provide necessary knowledge for the transition to a circular economy in the EU, as textiles have been identified as one of the key value chains in the EU's Circular Economy Action Plan (European Commission, 2020) and for the implementation of the EU Strategy on Sustainable and Circular Textiles (EC, 2022).

From the perspective of European consumption, textiles have, on average, the fourth highest negative lifecycle impact on the environment and climate change, after food, housing and mobility (EEA, 2022c). Europeans consume on average 14,8 kilograms of textiles per person per year. At the same time, Europeans also discard textiles, and a large proportion of the collected used textiles are sold on the global market (Watson et al., 2016). Several reports have discussed the role of fast fashion in the increasing quantities, suggesting that the decrease in quality has reduced the lifespan of clothes (EEA, 2022c). This report does not, however, aim to further investigate the reasons behind the discarded textiles, but rather expand knowledge on what happens to these textiles once they have been discarded.

The global market for used textiles is significant. In general, a large share of unsorted collected textiles from EU countries are sent for sorting in Eastern European countries, then re-exported, often through hubs in the EU, for reuse or recycling in Africa and Asia (ETC/WMGE, 2019). These exports might contribute to increased circularity of textiles worldwide by enabling reuse and recycling, which is higher in the waste hierarchy than energy recovery, and thereby in line with a circular economy. However, there are concerns that the exported used textiles can cause negative environmental, climate and socio-economic effects in the receiving countries (Cobbing et al., 2022; Watson et al., 2016).

Since the volume of used textiles is expected to further increase following the requirement on all EU Member States to separately collect textile waste by 2025 (Köhler et al., 2021), understanding the potential challenges associated with these exports is becoming more important. Moreover, a key action in the EU Strategy for Sustainable and Circular Textiles is to address the potential challenges from the export of used textiles (EC, 2022).

This report seeks to shed light on the following aspects:

1. How many used textiles does the EU export, and what are the trends of the last 20 years?
2. Which countries receive the EU's used textiles?
3. What are the impacts associated with the used textiles exported by the EU, in the main receiving countries?

Scope and limitations

To investigate the trends in used textile exports from EU and their impact on receiving countries, this report is based on a combination of desktop research together with quantitative and qualitative methods.

Trade data are used to show the quantities, value, and destinations of the exports over time. Desktop research is used to shed light on the situation in the main countries receiving used textiles from the EU as of the end of 2019. The method is elaborated on in Annex 1. Readers should be aware of the following limitations in the scope of this report:

1. Unless otherwise specified, this report uses data for 2019, since these are the latest complete datasets available before the Covid pandemic of 2020, which skewed consumption and trade data due to related restrictions.
2. As the United Kingdom (UK) was still part of the EU until 31 January 2019, EU28 data, which includes the UK, is used throughout the report. Europe refers to countries within the continent of Europe, but that were not part of the EU in 2019. This includes Albania, Andorra, Belarus, Bosnia Herzegovina, Faeroe Islands, Georgia, Gibraltar, Greenland, Iceland, Montenegro, North Macedonia, Norway, Rep. of Moldova, Serbia, Serbia and Montenegro, Switzerland, the Russian Federation and Ukraine.
3. The focus is on exports from the EU, i.e., textiles leaving the EU market, and only includes trade between EU countries to a limited degree.
4. There are important limitations to the data. Trade data are based on the reporting of individual countries, and therefore come with some levels of uncertainty. This has been taken into account in the analysis, but all numbers should be understood as indicative. Further, the data on export and import of used textiles are classified into two main product codes under the Combined Nomenclature (CN) ([1]) product code system, but the correctness of the classification is uncertain and therefore the analysis only builds on the reported classifications to a certain degree.
5. One of the main criticisms of the export of used clothes is that it hampers the market for locally produced clothes. Another suspected culprit is, however, the growing volume of imports of fast fashion to the receiving countries. Determining whether it is the import of new or used clothes that has the most significant impact on the local textile industries of a receiving countries is not within the scope of this report.
6. One flow of used textiles that has not been picked up by statistics is the unreported and thus potentially illegal collection and trade, which undoubtedly exists. This flow is by definition very hard to track down and previous efforts have failed (Watson et al., 2016). This report has, therefore, not attempted to track this flow.

[1] The Combined Nomenclature (CN) is the EU's 8-digit coding system. It is based on the Harmonized Commodity Description and Coding System (HS) developed by the World Customs Organization (WCO). The CN is used for the EU's common customs tariff. It is also used to provide EU trade statistics (European Commission, n.d.).

2. EU exports of used textiles – patterns and trends

Used textiles exported from the EU are classified into two main product codes under the CN-product code system: *6309 – worn textiles and clothing*; and *6310 – sorted and unsorted used rags and textile scraps*. In general code 6309 should be given to textiles fit for reuse (second-hand), while 6310 should be used for textiles unfit for reuse that may or may not already have been processed, for example, recycled, into other products such as industrial rags. There is no code for the export of textile waste, but textiles are on the European List of Waste (EU, 2015), and national authorities are therefore required to assess whether the used textiles that are to be exported should be classified as waste or not. As a rule of thumb, textiles under code 6309 – *worn textiles and clothing* are rarely considered waste, while textiles under code 6310 – *sorted and unsorted used rags and textile scraps* might be considered waste (Watson et al., 2016).

REUSE

Textile *reuse* refers to various means for prolonging the practical service life of textile products by transferring them to new owners, with or without prior modification, such as mending (Sandin and Peters, 2018).

RECYCLING

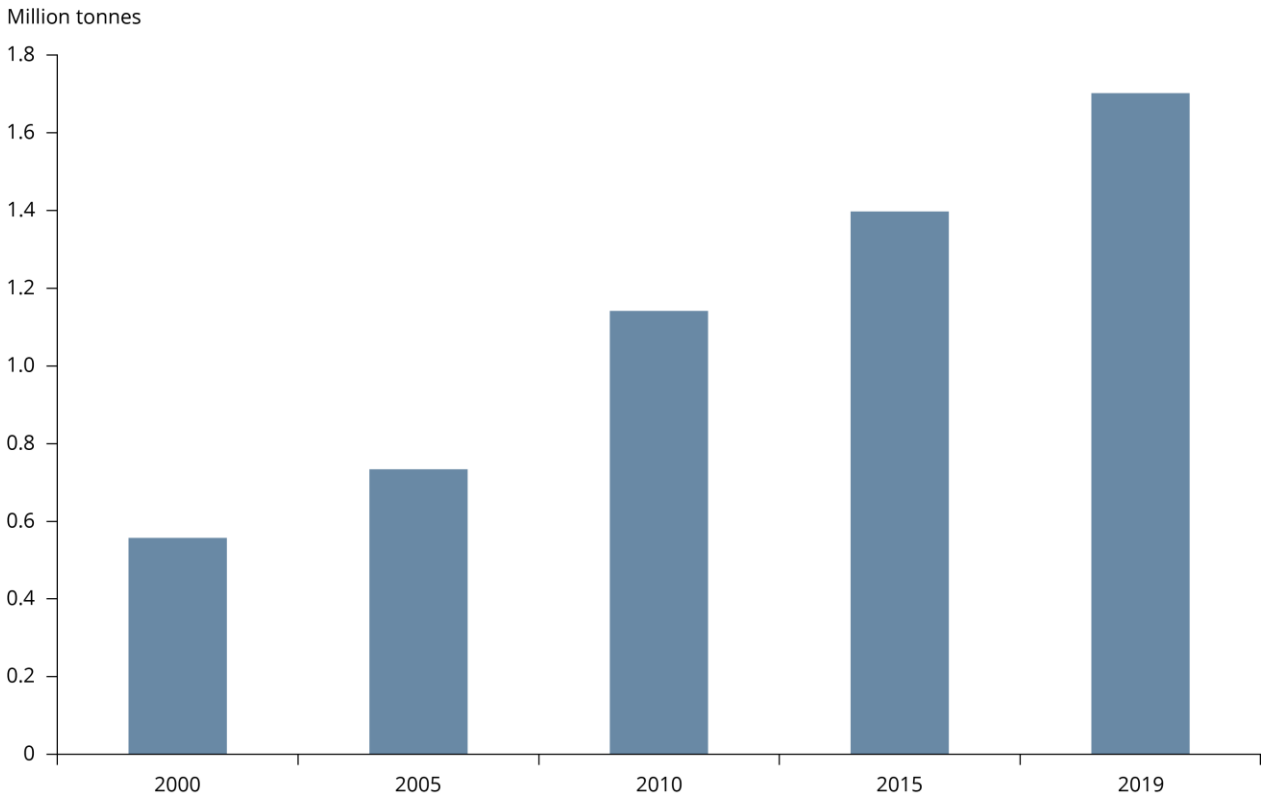
Textile *recycling* most often refers to the reprocessing of pre- or post-consumer textile waste for use in new textile or non-textile products (Sandin and Peters, 2018).

2.1 EU28 exports by weight, value, and classification

Between 2000 and 2019, the export of used textiles from EU28, both 6309 – *worn textiles and clothing* and 6310 – *sorted and unsorted used rags and textile scraps*, consistently increased from a little over 550 000 tonnes in 2000, to almost 1.7 million tonnes in 2019 (Figure 1) – 3.8 kilograms per person in 2019[2]. The trade value has somewhat followed the increase in net weigh, although over the last 20 years, it has increasingly lagged behind. At the beginning of the decade, the average price paid per kilogram of used textiles by the top ten importing countries that year was EUR 0.76; in 2010 it was EUR 0.58 and in 2019, down to EUR 0.57 (Based on data from UN Comtrade, accessed 02 October 2022). This shows that importers are currently willing to pay less per kilogram than some years ago. The reasons behind this price trend, however, cannot be seen in the data. For instance, value might have decreased due to a decrease in quality, or it may be that the market is becoming saturated, as suggested by the recent report by Fashion for Good (Fashion for Good, 2022). The fact that the volume of exports keeps growing despite falling prices might, however, indicate that there is still a demand for used textiles.

[2] Based on the reported total population of the European Union in 2019, from, 'European Union (EU) - total population from 2010to 2021', Statista (https://www.statista.com/statistics/253372/total-population-of-the-european-union-eu/) accessed 28 November 2022.

Figure 1 Exports of used textiles from the EU (EU-27 and the UK) to the rest of the world, 2000–2019, by weight (million tonnes)

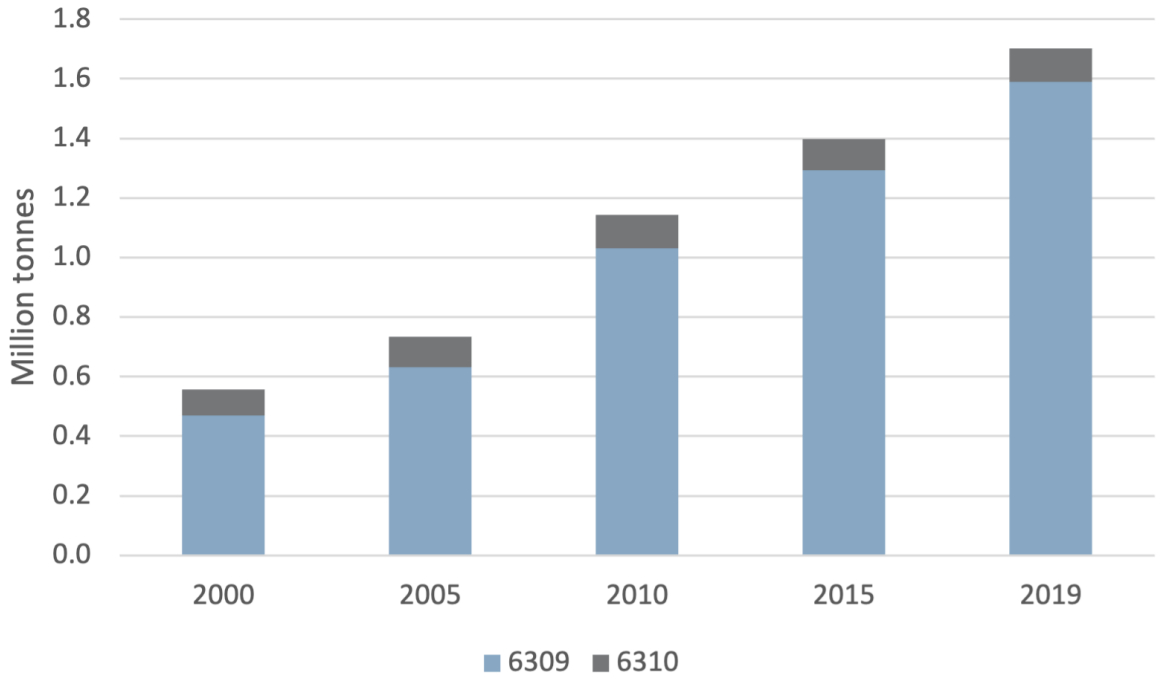


Note: Combined numbers for nomenclature categories 6309 and 6310.

Source: UN Comtrade (accessed 02 October 2022).

The last 20 years, the EU has mainly exported used textiles classified as 6309 – *worn textiles and clothing* and only amount textiles classified as 6310 – *sorted and unsorted used rags and textile scraps*. This latter proportion has stayed rather small and stable despite the general increase in exports (Figure 2).

Figure 2 Total volume of exports of used textiles, EU28, 2000–2019, million tonnes



Source: UN Comtrade (accessed 02 October 2022).

There is no clear explanation for this remarkable observation. It might be because most of what is exported is, in fact, still fit for reuse, and that a smaller and smaller percentage of total exports are rags and scraps. Alternatively, it could be that the classifications do not correctly reflect what is exported. Charitable and private collectors in most countries tend to make it clear at their collection sites that they only want to receive clean and reusable textiles (and footwear), often because non-reusable textiles yields a lower profit (Köhler et al., 2021). Others also accept non-reusable textiles.

In some countries such as Austria, Germany, Italy and the Netherlands, all textiles collection sites are classified as waste, regardless of the quality of the textiles or the intent of the donor, whereas other EU countries do not automatically do so (Köhler et al., 2021). There is very limited information on the quality of the waste textiles (Nørup et al., 2018), and there is currently no requirement at an EU level for reporting on the separate collection and treatment of post-consumer textiles (Köhler et al., 2021). It is therefore challenging to assess the actual type of the collected used textiles and know whether there is an increase in reusable items or scraps and rags.

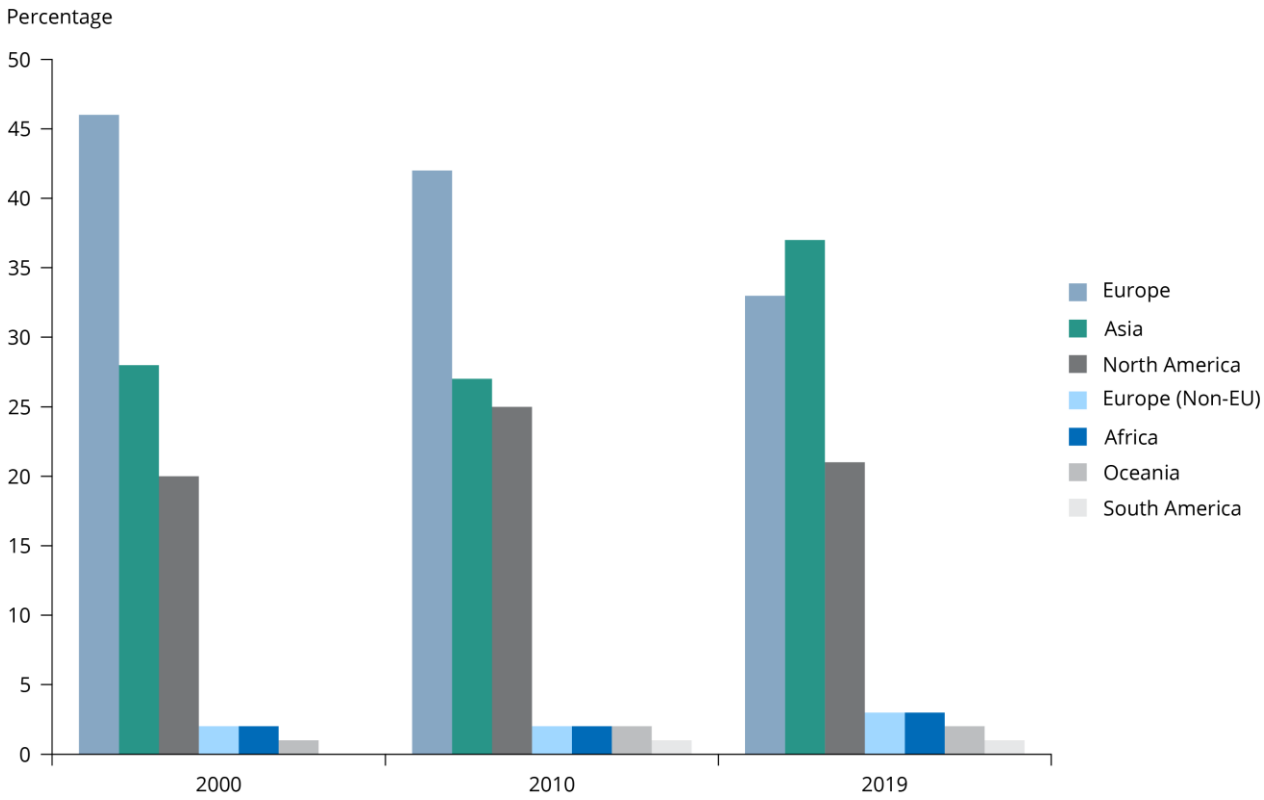
Once collected, the textiles follow different paths. Most charities pre-sort at least some of the collected textiles, to select the highest quality items (often called 'cream') to be sold in their own shops. The rest is typically sold to wholesalers for detailed sorting according to a multitude of different fractions in an attempt to correctly meet the demands of the global market. Second-grade textiles are typically exported to Eastern Europe and the Middle East, while the lowest quality ones end up in Asian markets. A special grade of lightweight garments, known as 'tropical mix', are often sold in sub-Saharan African markets (Trzepacz et al., 2023). That said, the wholesalers do not always have a clear idea of what finally happens to the textiles that they export for reuse elsewhere in the world (Köhler et al., 2021). A major part of these textiles are, however, exported unsorted as so-called 'originals', and are likely to contain both items fit and unfit for reuse. Batches of 'originals' are therefore likely to be classified under code 6309 even though they might contain rags and scraps (Watson et al., 2016). In other words, the classification does not necessarily describe the true state of what is exported. Because of this uncertainty, and because code 6310

makes up a small part of the total exports, the remainder of this report mostly disregards the difference between the two commodity codes, and rather looks at the two codes combined.

2.2 EU28 exports in relation to other regions

Even though the export of used textiles from the EU has been steadily increasing, in 2019, the EU was no longer the most important exporting region of the world. In 2000 the EU was responsible for more than 45 % of the total exports of used textiles worldwide but its share has declined consistently since, and in 2019 Asia exported more used clothing than the EU (Figure 3).

Figure 3 Total exports of used textiles by region, 2000, 2010 and 2019, per cent by weight



Note: Europe (non-EU) refers to countries within the continent of Europe, but that are not part of the EU. This includes Albania, Andorra, Belarus, Bosnia Herzegovina, Faeroe Islands, Georgia, Gibraltar, Greenland, Iceland, Montenegro, North Macedonia, Norway, Rep. of Moldova, Serbia, Serbia and Montenegro, Switzerland, The Russian Federation, Ukraine.

Source: UN Comtrade (accessed 02 October 2022).

This can also be seen when looking at the largest exporting countries globally. For the last two decades, 10 countries have consistently been among the top five exporters of used textiles (Table 1). The Republic of Korea has been among the top five every year since 2000, while Germany and the United States (USA) have been among them for 19 out of 20 years and the UK for 18. Over the period, the only other EU Member States to be represented among the top five were Belgium in 2000 and the Netherlands in 2000 and 2001.

Table 2 The world's top five exporting countries by total weight of used textiles, 2000-2019

2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2019
USA	Germany	Mexico	USA	USA	USA	USA	USA	Germany	USA	USA
Germany	USA	USA	Germany	Germany	Germany	Germany	Germany	UK	Germany	Germany
Korea	Korea	Germany	UK	UK	UK	UK	UK	Korea	UK	China
Netherlands	UK	UK	Korea	Korea	Korea	Korea	Korea	Japan	Korea	Korea
Belgium	Netherlands	Korea	Canada	Canada	Japan	Japan	Japan	China	China	UAE

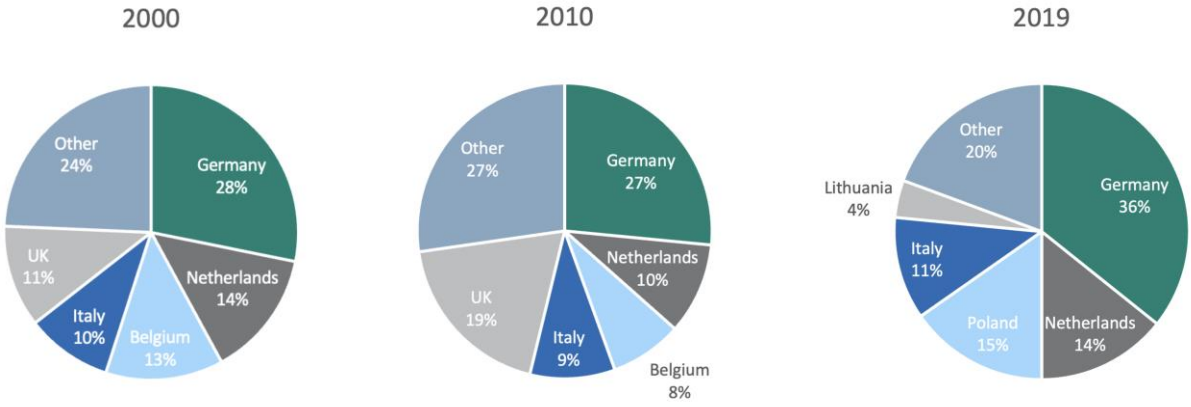
Note: UAE is an acronym for United Arab Emirates.

Source: UN Comtrade (accessed 02 October 2022).

2.3 Export hubs in the EU

Within the EU, some countries exported more than others and seem to have acted as import-export hubs for used textiles. Over the last 20 years, 75 % of the total exports from the EU have come from only five countries (Figure 4). Between 2000 and 2010, the exports were dominated by Belgium, Germany, Italy, the Netherlands, and the UK. In 2019 however, Germany exported a significantly larger share of used textiles than the other countries, and Poland and Lithuania entered the top five EU exporters, overtaking the UK and Belgium, suggesting a shift towards the east of the EU.

Figure 4 Share of EU28 exports of used textiles by country, 2000, 2010 and 2019



Note: Although the UK was technically still part of the EU in 2019, it is excluded from the pie chart for 2019 to focus on current EU countries (EU27).

Source: UN Comtrade (accessed 02 October 2022).

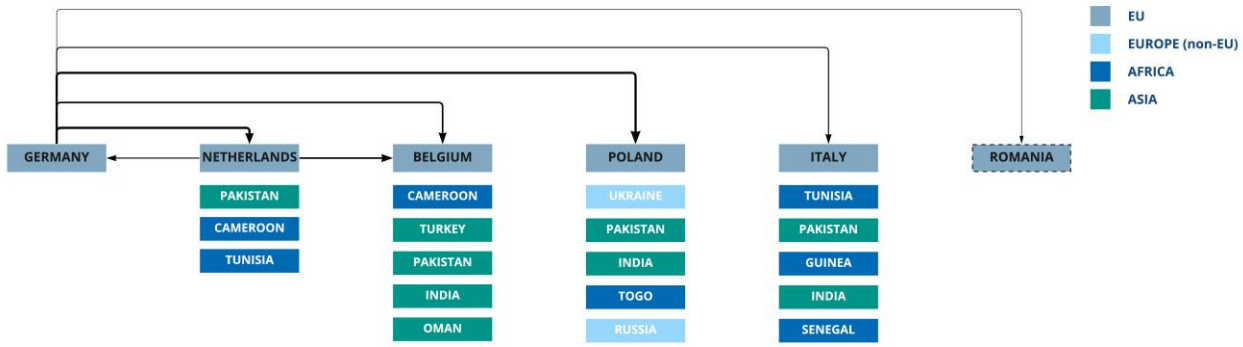
There is no clear explanation as to why only five out of 28 EU Member States export around 75 % of all EU exports of used textiles. It could be because these countries are in fact discarding more used textiles, because they have better collection systems than other countries or because they have less internal reuse. On average 38 % of used textiles are collected separately in the EU but there are large differences between countries, for instance only 12 % were collected in Spain but 60 % in Germany (Fashion for Good, 2022). Such differences in internal collection can be due to differences in policies and infrastructure, support for sorting and recycling initiatives, consumer behaviour, or the availability of subsidies for collecting actors and research and development (R&D) on methods of collection, all of which differs between EU countries (Watson et al., 2018). For instance, Belgium and the Netherlands were found to have been the most active in increasing textile collection to date (Fashion for Good, 2022).

Researchers have found that used textiles are subject to an intricate trade between EU Member States before leaving the region, and it is therefore likely that the largest exporters have not only been sending abroad used textiles that are collected locally (Box 1) (Fashion for Good, 2022; Watson et al., 2016).

Therefore, another reason for the concentration of exports in a few EU countries could be that these large exporting countries are importing used textiles from other EU Member States for re-export beyond the EU, thus acting as export hubs. The presence of ports/harbours for international shipment in some of these countries make them logical export hubs.

The five EU hubs, Belgium, Germany, Italy the Netherlands, and Poland, have quite different export profiles, i.e., to which other countries they send the most (Figure 5). The top five destinations for Germany are other EU countries: Belgium, Italy, the Netherlands, Poland, and Romania. The top five for the Netherlands are Belgium and Germany, as well as Cameroon, Pakistan, and Tunisia. The top five countries to which Belgium, Italy and Poland export are all outside of the EU. What happens with these textiles after they have been exported has, however, not been thoroughly mapped, but the subsequent sections attempt to cast some light on this question.

Figure 5 The top five destination of cross-border movements of used textiles, five EU hubs 2019



Notes: The figure shows where the top five EU hubs export to the most. Germany exports for the most part to the other EU Hubs, although also to Romania, which is not an EU Hub. The Netherlands also exports largely to other EU Hubs. The other EU Hubs mainly exports to countries outside of the EU.

The thickness of the arrows indicates the quantity of exports within the EU; the thickest arrow goes to the country that received the most exports, the second thickest the country receiving the second-most exports, and so-forth.

The receiving countries outside of the EU are listed below the EU Member States, in order of quantity received.

Romania is not one of the EU hubs, and data on to which countries Romania exports has therefore not been included.

Source: UN Comtrade (accessed 02 October 2022).

Box 1 Understanding intra-EU trade dynamics

It is not within the scope of this report to explore the intra-EU trade in used textiles and why certain countries appear to act as import-export hubs for used textiles. There are, however, indications that it might be related to the benefits of specialisation, economies of scale and the presence of harbours. Denmark, Finland and Sweden, for instance, do not have significant wholesale/sorting capacity, whereas the Netherlands and Poland have a large wholesale and sorting sector (Köhler et al., 2021). Germany also does not have a sufficient sorting capacity locally compared to what is collected, and in the Netherlands most of the local sorting capacity is used to sort textiles from Germany (Fashion for Good, 2022). Furthermore, Belgium, Italy, and the Netherlands have large export harbours.

As sorting is a manual and labour-intensive process, it is more economical to do in countries with lower labour costs, such as Poland (Fashion for Good, 2022). As the market is characterised by tight margins, saving on labour cost can make the difference between operating with or without a profit. Albeit not within the scope of this report, future research and recommendations might also take account of the risks in a system operating within (increasingly) tight margins.

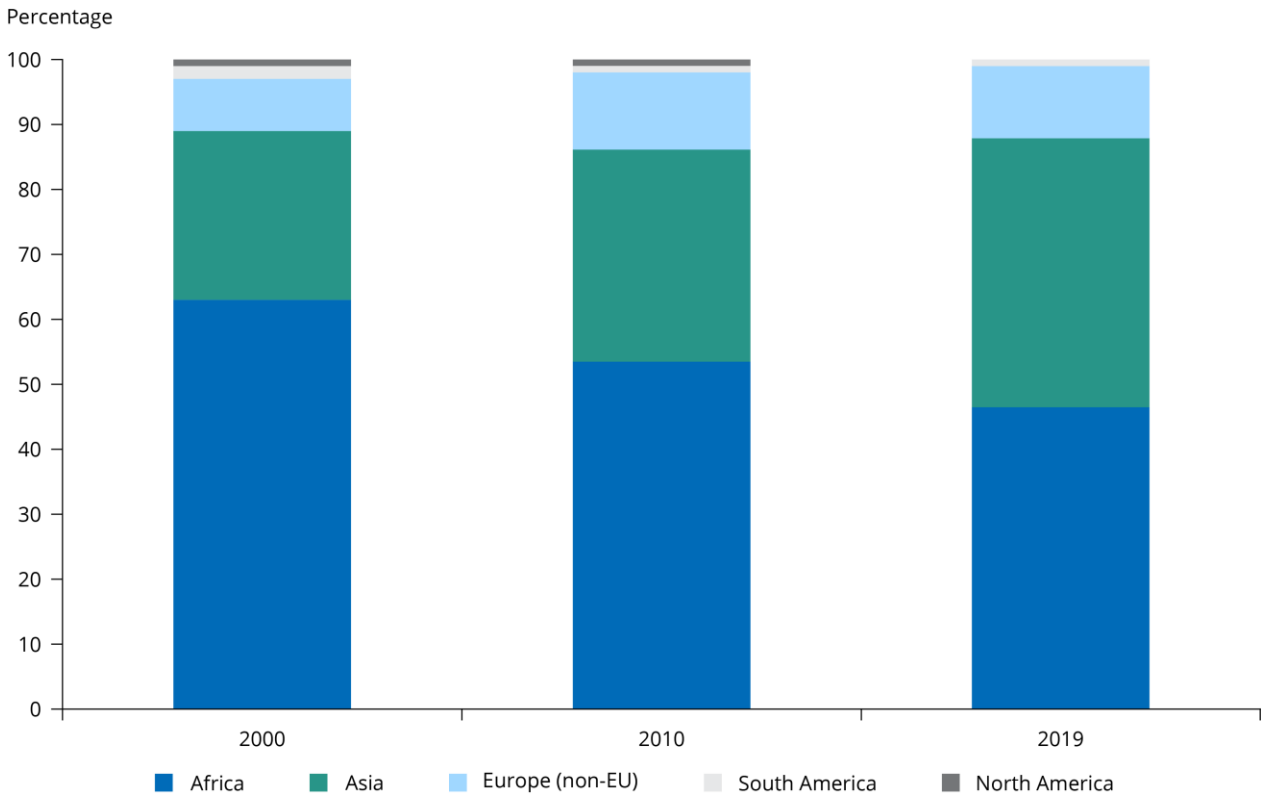
More about intra-EU trade dynamics can be read in the recent report from Circle Economy and Fashion for Good: https://reports.fashionforgood.com/report/sorting-for-circularity-europe/.

3. Countries receiving used textiles from the EU

Throughout the past two decades, Africa has been the main receiving continent of used textiles from the EU, but by the end of the period, Asia had significantly increased its share and by 2019 was almost as big as Africa (Figure 6). In 2000, Africa imported more than 60 % of all EU exports, and Asia 26 %. In 2019 the proportions had drastically changed to respectively 46 % and 41 %, meaning that the two continents were almost importing an equal share of the used textiles that the EU exported.

Non-EU European countries have imported a proportion of EU used textiles, around 10 %, which has remained relatively constant over the years. North and South America, and Oceania imported 0-2% of EU exports.

Figure 6 EU28 exports of used textiles to other regions, 2000, 2010 and 2019, per cent



Note: Figures may not sum due to rounding.
Source: UN Comtrade (accessed 02 October 2022).

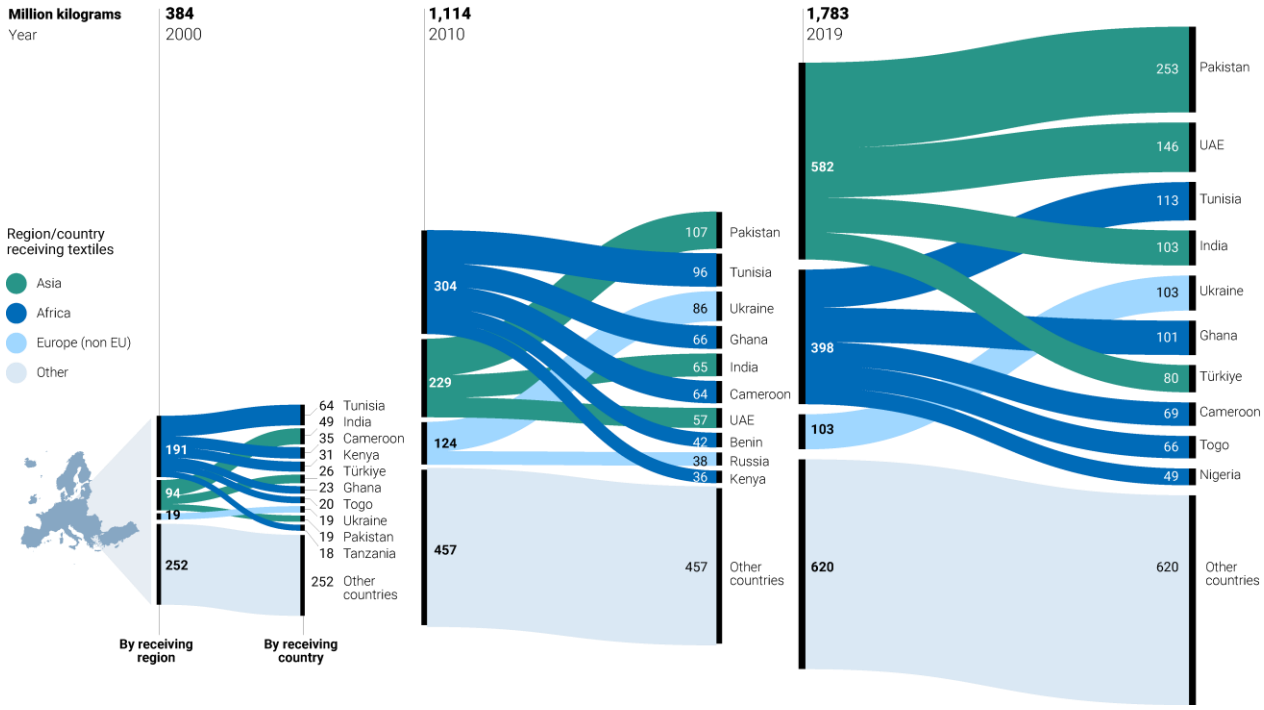
The development of Asia as a main receiving region is also seen when looking at specific countries. In the last 20 years, several Asian countries have become global import-hubs for used textiles and are importing larger shares of total exports from the EU.

As seen in Figure 6, over the last 20 years, Asia has taken an increasingly larger share of the EU's used textiles, and Africa has reduced its share. This is also seen when looking at the top 10 receiving countries (Figure 7). Between 2000 and 2019, more Asian countries have risen to the top of the ranking. From 2000 to 2010, Pakistan rose from eighth to first place, and retained that in 2019. The UAE, which was not even part of the list in 2000, was in seventh place in 2010 and second place in 2019. In 2000, three African countries made up the top five, whereas in 2019, one African, one European and three Asian countries formed the top five. This trend was also found by Köhler et al. (2021), who point out that the changes in global supply and demand are particularly affecting lower grade reusable clothing, that global markets for

these are becoming saturated, and clothing that was previously exported to Africa, the Middle East and other global markets for reuse is now being downcycled instead (Köhler et al., 2021).

The shift is not only seen in which countries are represented in the ranking, but also in the size of their shares. In 2000, the top 10 receiving countries imported 54.6 % of all the EU's used textiles, whereas in 2019, they imported 64 %. This suggests that specialisation in textile import is taking place.

Figure 7 EU27 exports of used textiles, by receiving country, 2000, 2010 and 2019, million kilograms



Note: UAE is an acronym for United Arab Emirates.
Source: UN Comtrade (accessed 02 October 2022).

4. Understanding the receiving countries

The global market of used textiles has changed somewhat in the last 20 years, with a significant shift from Africa to Asia, the two main receiving regions. This chapter presents some of the top importing countries in Africa and Asia to better understand the trends ([3]). The import of used textiles, local textile industry, waste management system and when relevant, the policies regarding the imports of used textiles, have been studied for each country through desk research.

4.1 Africa

The continent of Africa's share of imports of used textiles from the EU has fallen from 63 % in 2000 to 46 % in 2019, whereas Asia's share has risen from 26 % to 41 % ([4]). However, there are large differences between Northern and Sub-Saharan Africa.

In Sub-Saharan Africa, the import of used textiles has been affected by important political changes the last 70 years. In the late 1950's–1960's, the region experienced industrialisation, but political instability in the 1970's and 1980's sparked the need for economic reform (Mendes et al., 2014). In the 1980's and 1990's, the continent was affected by the liberalisation of world trade. During that time, many Sub-Saharan countries became highly indebted and were subject to Structural Adjustment Programmes (SAPs), followed by long-term Economic Recovery Programmes (ERPs) designed to restructure and revitalise their economies through extensive liberalisation and privatisation, diversification of exports, and the like (Simon, 2009). The liberalisation meant that the countries were not able to protect their local markets with policies such as tariffs or import duties, which has been accused of having destroying the local apparel sector between 1981 and 2000 (Amanor, 2018). The liberalisation and decline of the local manufacturing caused unemployment and increased poverty and thus a need for affordable clothes, which contributed to the expansion of the global second-hand market from USD 207 million to USD 1 498 million over the same time (Amanor, 2018). The accelerated growth of the trade in used textiles became an important source of income as it provided informal employment opportunities for many people, particularly women who engage in selling in urban markets, outside the marketplaces, and in the streets (Amanor, 2018). The position of Africa as the main importing continent of used textiles has persisted, although in recent years, many African countries, and in particular the East African Community (EAC), have been trying to ban the import of used textiles (Amanor, 2018).

[3] Ghana is included in this country study, although the most important European exporter to Ghana is the UK (Ricketts and Skinner, 2019). Consequently, Ghana might not have been one of the main receiving countries after 2020 when the UK left the EU. However, for this report, which covers 2000–2019, Ghana is included as the UK was part of the EU28 during these years.

[4] Based on data from UN Comtrade (accessed 02 October 2022).

BOX 2: Import bans for used textiles in the East African Community

Over the last 20 years, several African countries have expressed interest in limiting the imports of used textiles. In 2016, the EAC, a regional intergovernmental organisation of six Partner States, Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda, initiated a second-hand clothing import ban with the goal of accomplishing a complete ban by 2019 (Sustainable Amor, 2020). As a first step, Rwanda, Tanzania, and Uganda started increasing taxes and import duties. For instance, Rwanda set a 349.5 % duty on used clothing, compared to a tariff rate of 15.3 % on new clothes (Sustainable Amor, 2020). Kenya however, which was one of the top 10 importing countries in 2000 and 2010, stated in 2019 that it could not economically support the 2019 deadline because it was unable to meet domestic demand with local production (Sustainable Amor, 2020). Most of the other EAC Partner States also backtracked on the ban. For most, it was because of the African Growth and Opportunity Act (AGOA), a trade preference programme to help countries in Sub-Saharan Africa grow their economies by expanding exports to the USA. This agreement stated that the EAC Partner States were not allowed to ban the imports of used textiles without losing their tariff-free status with the USA. Of the EAC Partner States, only Rwanda decided to continue with their tax increase (Sustainable Amor, 2020).

In Northern Africa, local textile production has historically been stronger than in the southern parts of the continent, and countries such as Algeria, Morocco and Tunisia have developed textile industries (Madison, forthcoming; Kohan Textile Journal, 2021). However, these industries are also challenged by imports (Kohan Textile Journal, 2021).

In the subsections below, the trade in used textiles in Ghana and Tunisia are discussed to further understand what happens in Sub-Saharan and Northern Africa, respectively.

Ghana

After Ghana's independence in 1957, the development of the manufacturing sector, including textiles, was a priority to the first independent government. The Import Substitution Industrialization (ISI) policy, which aimed to protect the domestic production, was at the centre of the acceleration of the manufacturing industries (Amanor, 2018). Total employment in the manufacturing sector alone increased by nearly 90 % between 1962 and 1970. Political instability in the 1970s and 1980s, however, led to poor economic performance and required the introduction of the Economic Recovery Programme in 1985 together with the establishment of the previously described liberalisation reforms (Section 4.1) and the subsequent decline of the local clothing sector. As in many other Sub-Saharan countries, this led the local industry to losing out to competition from foreign imports, and local production plummeted.

Ghana has a substantial second-hand clothing market, and more than 90 % of Ghanaians wear second-hand clothing (Ahiable and Triki, 2021). Ghana has been one of the top 10 of importing countries since 2000, and in 2019 was ranked sixth (Figure 7). Containers of second-hand clothing arrive at the Tema port in Ghana twice a week from across the globe, and 70 % are then driven to Accra's Kantamanto market (Ahiable and Triki, 2021) – every week, the market receives approximately 15 million clothing items (Ricketts and Skinner, 2019). Upon arrival, the imported textiles are purchased in bulk by local resellers, who sort out the most valuable ones for resale, hoping to find as many good pieces as possible which can be sold before there the second biweekly delivery arrives (Ricketts and Skinner, 2019). This large-scale operation involves around 5 000 shops and provides work for some 30 000 people. However, almost 40 % of the imports cannot be sold (Besser, 2021; Ricketts and Skinner, 2019; Ahiable and Triki, 2021) – some clothes arrive damaged beyond repair or are of such poor quality that customers have little interest in them, and further, supply is larger than local demand (Ahiable and Triki, 2021). Ghana has a population of 31 million people, so it is unlikely that all the 30 million garments that arrive every fortnight will be sold (Ahiable and Triki, 2021). On the other hand, second-hand items seem to be (increasingly) preferred to

new ones; in 2015 net imports of second-hand clothes accounted for 76 % of net clothes imports, and in 2019, 92 % ([5]). Nonetheless, the textile waste is disposed of in open landfills, discarded into open drains which ultimately take the waste to the ocean, or burned in unofficial dumpsites. Clothing waste collected from Kantamanto represents a major waste stream in the city of Accra and causes significant air, soil, and water pollution (Ahiable and Triki, 2021). The used textiles are, however, also re-exported to neighbouring countries (Amanor, 2018).

There is debate about whether Ghana should impose a ban on second-hand clothing or to rely on innovation to combat the many problems that has arisen from importing second-hand textiles (Kaledzi, 2022), but there are also discussions about other tactics. Both the German Development Agency (*Deutsche Gesellschaft für Internationale Zusammenarbeit,* GIZ) and the Tony Blair Institute for Global Change have, for instance suggested that Ghana invests in recycling to turn the used textiles that end up as waste into a valuable raw material (Ahiable and Triki, 2021).

Tunisia

Tunisia has a large industry production of new textiles products and is an important exporter to European countries. In addition to exporting textiles, Tunisia was also the third largest importer of used textiles from the EU in 2019 (InTex, 2022; Invest in Tunisia, 2013) ([6]). In 2017, used textiles amounted to 5 % of Tunisia's total imports (InTex, 2022). Overall, Tunisia imports for local reuse and re-exports to other countries on the African continent.

In Tunisia, there is a flourishing market for used textiles, the so-called *fripperies*, and 94 % of Tunisians are reported to buy second-hand (Boukhayatia, 2022). Imported second-hand clothes from the EU are seen as of superior quality to what can be found new, which might explain the high market demand. However, only 30 % of imported used textiles is directed to the local reuse market, another 30 % goes for export to other African countries and the remaining 40 % ends up as scrap or is destroyed (Boukhayatia, 2022). Compared to Ghana, the used textiles sector is more regulated in Tunisia, at least since 1995. The import, transformation and distribution of second-hand merchandise are regulated by Decree 95-2396 of 2 December 1995. This prohibits the transfer of second-hand goods between governorates ([7]) and sets specific annual quotas for sorted merchandise across the different governorates. Lastly, factories in the sector are subject to industrial warehouse regulations (Boukhayatia, 2022).

It has not been possible to identify what happens to the approximately 40 % of imported used textiles that ends up as scrap. The waste management system in Tunisia, however, faces big challenges. Most waste ends up in landfills, which are often semi-controlled and unsanitary (Reverse Resources and Blumine, 2021). Another aspect is the presence of widespread informal waste collection, such as the bulk delivery of waste from manufacturers and informal waste-collection by non-specialised companies. This happens despite regulations stipulating that companies in the *fripperies* market must have an internal shredding capacity. However, this is not extensively controlled by the specifications for waste management set by the Ministry of the Environment, and therefore the shredding capacity is largely underused. The share of textiles that is in fact shredded are made into non-woven products such as filling (Boukhayatia, 2022). Although 40 % ends up as waste, Tunisia still largely imports used textiles for internal reuse, indicated by the fact that since the Covid-19 pandemic, the country has had a shortage of used textiles for sale on the internal market (Boukhayatia, 2022).

5 Based on data from UN Comtrade (accessed 09 November 2022). Net imports = imports - exports.

6 UN Comtrade, accessed 02 October 2022

7 This Arabic term can be translated as province.

4.2 Asia

Since 2000, Asia has been the second largest importer of used textiles from the EU, and over the last 20 years has significantly increased its share. In 2019, Asia imported almost the same share of EU exports as Africa. Compared to Africa, however, Asia has managed to develop strong local textile production in the second half of the 20th century, and as of 2019 Asian countries were the main exporters of new garments globally – China is by far largest, but India and Pakistan also export significant quantities (Intrepid Sourcing, 2022). It has been suggested that this is due to the governments of northeast Asian countries using policy to move their countries beyond basing their industry on extracting raw material and towards production, through protectionism, investment and support after World War II (Pham, 2017).

In the next sections, the trade in used textiles from the EU in Pakistan, the UAE and India, all of which had risen to be part of the top 10 importing countries by 2019, is discussed.

Pakistan

Global trade data show that the EU did not export used textiles to Pakistan until 2003 ([8]). As of 2019 however, Pakistan is by far the biggest importer of used textiles from the EU (Figure 7), which are mostly either recycled or re-exported (Watson et al., 2016).

Textile recycling has increased enormously in Pakistan over the last two decades: the first textile recycling license was issued in 2004 and in 2018 the number was 82 (Garson & Shaw, 2019). Used textiles are mostly imported to Special Economic Zones where there are business incentives (Watson et al., 2016). For instance, the Karachi Export Processing Zone (KEPZ), which, according to the global wholesale supplier of used clothing Garson & Shaw (2019) is emerging as a global hub for the industry. In 2018, used textiles accounted for 38 % of the exports from KEPZ. Half of the imported textiles were either sold for fibre extraction or remanufactured into industrial rags, and the other half were re-exported to other developing countries (Garson & Shaw, 2019). This is in line with the findings from 2016 when Fretex, an International buyer, reported that 57 % were recycled, 36 % exported either as cut industrial wipes for the global market or slashed textiles exported to India for mechanical recycling; and 21 % was mechanically recycled domestically (Watson et al., 2016). Another company reported that 40 % was re-exported to Africa for reuse (Watson et al., 2016). The business model of the receiving companies in Pakistan was found to differ depending on whether they are receiving pre-sorted or more comprehensively sorted textiles. If, for instance, the textiles have undergone detailed sorting in Europe prior to their arriving to Pakistan, less is then sent to other developing countries as the textiles fit for such destinations have already been removed, and more ends up being recycled (Watson et al., 2016).

Despite the significant recycling industry and capacity that has been built up over the past decades, there are signs that more political control will be exercised on the sector in Pakistan. The country's *Textile and Apparel Policy for 2020–2025* states that Pakistan intends to limit the import of second-hand textiles (Ministry of Commerse, 2020). The textiles and apparel industry has grown to be Pakistan's single largest manufacturing sector and the Ministry of Commerce states " *the Import of used clothing has continuously been hurting manufacturing sector, […], and that new clothes are imported under (the classification of) used clothing*" (Ministry of Commerse, 2020). The ministry therefore anticipates that imports of used clothing will be increasingly monitored and restricted to protect consumers and vulnerable classes of society (Ministry of Commerse, 2020). This might indicate that, even though some sources state that most of the imports are for recycling, a part does indeed go to national reuse.

Textile waste, which is not recycled in Pakistan or re-exported, can end up in landfill if it is discarded through the municipal waste system (International Trade Administration, 2022). Records show, however,

[8] UN Comtrade, 2022

that textiles only make up 2 % of Pakistan's municipal solid waste (International Trade Administration, 2022). Chances are that most textile waste is rather incinerated as fuel for other industries, as is the case for cotton waste from local textile manufacturing, which is sold to brick kilns as an alternative and cheaper fuel than wood or coal (Noman et al., 2013).

United Arab Emirates

Another Asian country that has risen recently to become one of the leading importing countries of used textiles from the EU is the UAE.

The textile Industry is the UAE's second largest, after oil, and the UEA acts as a shipping hub for other countries' textiles industries. It is concentrated in free zones, such as the Dubai Textile City located in Al Alwir Free Zone, which facilitates storing textile fabrics for long periods without attracting customs duty. This free zone, a collaboration between the Textile Merchants Group (TEXMAS) and the Dubai Port and Customs Authority, specialises in supporting traders in the re-export business (Commitbiz, 2020).

There are several used textiles and shoe import-export companies in the UAE serving a growing market. They offer sorting, trading, and recycling services. Clothes suitable for reuse are re-exported, mainly to Africa, Eastern Europe, and the Middle East, and, to a lesser extent, to India and Pakistan. Clothing unsuitable for re-export is shredded and processed into industrial wipes (Medina Textiles FZE, 2022; SK Export, 2022). Some individual company records show a majority of reuse (SK Export, 2022); however, it has not been possible to find details from the companies or the industry as a whole of the proportions re-exported for reuse or converted into rags.

In the UEA, most of the waste ends up in municipal landfills or dumpsites (The United Arab Emirates' Government portal, 2021), and this therefore likely also happens to the textiles neither exported nor recycled. This might, however, change as back in 2012 the government stated the wish to reduce the amount of waste being sent to landfills to zero by 2030 (The United Arab Emirates' Government portal, 2021). In 2022, the Dubai municipal government ordered a major rise in the cost of landfilling non-recyclable waste in an attempt to move towards the 2030 zero-waste goal (Sukkar, 2022).

India

The import of used textiles in India has grown steadily over the past 30 years (Kishco Group, n.d). Especially in the last five years there has been an increase the importation of used textiles to India (Fashion For Good, 2022). Apparently, this is due not only to exports from the EU, but also other Asian countries. Approximately 70 % of second-hand clothing imported into India from developed regions such as Canada, the EU, Japan and the USA, arrives at Kandla port (Fashion For Good, 2022). The import of used textiles is organised in Economic Zones (Khanna, 2022). Importers specialise in re-export, or recycling into wipers, Indian rugs (dhurries) and blankets (Kishco Group, n.d).

In India, to wear used clothes has traditionally been viewed negatively, and therefore the country has been more focused on transforming used textiles into new products ([9]) (Amanor, 2018). India therefore forbids the importation of used textiles for reuse, whereas the import of textile scraps is allowed at all ports of India (Khanna, 2022). Therefore, the textiles sent for reuse in India are slashed into smaller fragments according to Indian law so that they cannot be reused (Watson et al., 2016). Imported wool fibres or rags are shredded and spun into recycled yarn for manufacturing new blankets, knitted yarns and woollen fabrics for the domestic and international clothing markets like South Asia and East Africa (Amanor, 2018).

[9] A product can refer to different levels of refinement. For example, something that is a product in a business-to-business context, for example, a fibre or fabric, might not be in a retail or consumer context in which garments are key textile products (Sandin and Peters, 2018).

5. Conclusions

This report aimed to provide a first take on the patterns of the export of used textiles from the EU, and to explore what happens with these textiles on the global marked.

The export volumes of used clothing from the EU increased steadily between 2000 and 2019. Despite this, in 2019 the EU was surpassed by Asia as the largest exporting region of used textiles in the world, breaking a long-standing pattern.

There is also an intricate trade in used textiles between EU countries, to an extent that some countries, including Germany, Italy, the Netherlands, and Poland seem to act as import-export hubs for used textiles. The emergence of these hubs might be due to, amongst other things, specialisation, economies of scale, labour costs and infrastructure, such as the presence of harbours.

Between 2000 and 2019, the EU exported mostly to Africa and Asia, and to a limited degree to non-EU countries in Europe. While in 2000, almost two thirds of used textiles ended up in Africa, by 2019, this was only 46 %, and Asia almost doubled its share to 41% of used textiles exported from the EU.

To better understand what happens to the used textiles exported from the EU, five detailed country studies were carried out for the top importing countries in Africa and Asia. In Africa, the import of used textiles seems to be mainly meant for local reuse as there is a demand for cheap used clothes from Europe, which seems to be preferred to some foreign imports. What is not fit for reuse mostly ends up in open landfills and informal waste streams. Nonetheless, several African countries have been debating the possibility of banning the importation of used textiles as a way of protecting and strengthening local textile production, indicating that the imports also come with social and environmental impacts. In Asia, on the other hand, most of the used textiles are imported to so-called economic zones, where they are sorted and processed. In the countries studied for this report, importation for local reuse is restricted. Instead, the used textiles seem to be recycled locally, mostly downcycled into industrial rags or filling, or re-exported either for recycling in other Asian countries or for reuse in Africa. Those textiles that cannot be recycled or re-exported are likely to end up in the general waste management system.

This report identifies a range of questions which warrant further investigation.

Overall, the export of used textiles is characterised by a lot of mist. Firstly, it is uncertain what types of textiles are exported and of what quality they are. As suggested by Köhler et al., (2021), this report also finds that that there is a lack of consistent data on the quantities and fate of used textiles and textile waste in Europe. Different countries collect and classify textiles differently, and the UN Comtrade statistics regarding exports do not necessarily match the rest of the findings. One important finding of this report is that the fate of the imported textiles does not seem to be reflected in the commodity codes of exported textiles. Further, since there are signs that Asian importers re-export parts of what they import, the picture becomes increasingly unclear. A better understanding of where the used textiles go after the first receiving country is crucial to correctly identify what happens to used textiles from the EU.

The reuse and recycling of textiles have considerable environmental benefits through offsetting new textiles production (Trzepacz et al., 2023; Sandin and Peters, 2018). In the case of exports of used textiles, however, the environmental benefits depend on whether the export of used textiles does in fact replace the production of new textiles or fibres. A recent LCA study by the European Recycling Industries, finds that if the replacement rate in the receiving country is below 10 %, recycling in Europe is to be favoured from an environmental perspective (Trzepacz et al., 2023). The part of the used textiles from the EU that are of too low quality to be reused at all or are not reused for a very long, and therefore ultimately end up as waste, do not necessarily replace the production of new clothing. From an environmental perspective, these should then not be exported in the first place.

The quality of the textiles exported from the EU, and how this impacts their fate, is important but complex and warrants further research. It would here be particularly important and interesting to get better understanding of the market fit between what is exported and the needs of the receiving country in order to reduce the risk of exported reusable or recyclable items going to waste. Additionally, there needs to be a better understanding of available sorting and recycling capacities and their ability to deal with clothing unfit for reuse, in order to avoid improper waste management and landfilling.

Recently, the European Parliament has adopted new reporting rules for all European multinational companies, requiring reporting on both up-and downstream societal and environmental impacts, as laid out in the Corporate Sustainability Reporting Directive (CSRD), adopted on 10 November 2022 (European Parliament, 2022). Although the directive only covers large companies, it is expected that these will have to request documentation from smaller companies in their value chain, and thereby small and medium-sized enterprises (SMEs) will also need to strengthen their own knowledge and documentation (Dansk Industri, 2022). Consequently, there might be an increase in the efforts of exporting companies to understand the fate of the used textiles they export.

In summary, the fate of the used textiles exported from the EU is highly uncertain. The common public perception of used clothing donations as generous gifts to people in need does not fully match reality. In fact, used clothing is increasingly part of a specialised global commodity value chain. While reuse may still be the main aim of African receiving countries, recycling and processing for re-export is on the rise in Asian receiving countries.

References

2000/532/EC: Commission Decision, 2000, 2000/532/EC: Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance) (OJ L).

Abdulrahman, A., 2021, 'Solid Waste Management in Tunisia', EcoMENA (https://www.ecomena.org/solid-waste-management-tunisia/) accessed 26 September 2022.

Ahiable, K. and Triki, C., 2021, 'Tackling Ghana's Textile-Waste Challenge', p. 15.

Amanor, K., 2018, *Developing a Sustainable Second-Hand Clothing Trade in Ghana*, Doctoral thesis, University of Southampton (https://eprints.soton.ac.uk/433269/) accessed 18 December 2022.

Besser, L., 2021, '"Dead white man's clothes": The dirty secret behind the world's fashion addiction', *ABC News*, 11 August 2021 (https://www.abc.net.au/news/2021-08-12/fast-fashion-turning-parts-ghana-into-toxic-landfill/100358702) accessed 27 November 2022.

Boukhayatia, R., 2022, 'Tunisia's secondhand clothes market, barometer of citizen purchasing power', Nawaat (https://nawaat.org/2022/04/28/tunisias-secondhand-clothes-market-barometer-of-citizen-purchasing-power/) accessed 26 September 2022.

Cobbing, M., Daaji, S., Kopp, M., Wohlgemuth, V., Dena, H.K., Dreher, T., Hüttemann, A., Zils, M., 2022, *Poisoned Gifts*. Greenpeace Germany.

Commitbiz, 2020, 'Textile Industry in the UAE – An Overview', Commitbiz (https://www.commitbiz.com/blog/textile-industry-in-the-uae-an-overview) accessed 26 September 2022.

Dansk Industri, 2022, 'ESG-direktiv vedtaget – selv de store frygter omfanget - DI', DI Business (https://www.danskindustri.dk/di-business/arkiv/nyheder/2022/11/esg-direktiv-vedtaget--selv-de-store-frygter-omfanget/) accessed 30 November 2022.

EEA, 2019, *Textiles in Europe's circular economy*, EEA Briefing No 10/2019, European Environment Agency, Copenhagen (https://www.eea.europa.eu/publications/textiles-in-europes-circular-economy) accessed 26 March 2020.

EEA, 2021a, *A framework for enabling circular business models in Europe*, EEA Briefing No 22/2020, European Environment Agency, Copenhagen (https://www.eea.europa.eu/publications/a-framework-for-enabling-circular) accessed 31 May 2021.

EEA, 2021b, *Plastic in textiles: towards a circular economy for synthetic textiles in Europe*, European Environment Agency, Copenhagen (https://www.eea.europa.eu/publications/plastic-in-textiles-towards-a) accessed 28 April 2021.

EEA, 2022a, 'About us', European Environment Agency, Copenhagen (https://www.eea.europa.eu/about-us) accessed 29 September 2022.

EEA, 2022b, *Microplastics from textiles: towards a circular economy for textiles in Europe*, EEA Briefing, European Environment Agency, Copenhagen (https://www.eea.europa.eu/publications/microplastics-from-textiles-towards-a) accessed 13 October 2022.

EEA, 2022c, *Textiles and the environment: the role of design in Europe's circular economy*, Briefing, European Environment Agency, Copenhagen (https://www.eea.europa.eu/publications/textiles-and-the-environment-the/textiles-and-the-environment-the) accessed 11 February 2022.

ETC/CE, 2022a, *Microplastic pollution from textile consumption in Europe*, ETC/CE Report No 1/2022, European Topic Centre Circular Economy and Resource Use, European Environment Agency, Copenhagen (https://www.eionet.europa.eu/etcs/etc-ce/products/etc-ce-products/etc-ce-report-1-2022-microplastic-pollution-from-textile-consumption-in-europe) accessed 13 October 2022.

ETC/CE, 2022b, *Textiles and the Environment - The role of design in Europe's circular economy*, ETC/CE Report No 2/2022, European Environment Agency, Copenhagen (https://www.eionet.europa.eu/etcs/etc-ce/products/etc-ce-products/etc-ce-report-2-2022-textiles-and-the-environment-the-role-of-design-in-europes-circular-economy) accessed 26 April 2022.

ETC/WMGE, 2019, *Textiles and the environment in a circular economy*, Eionet Report No 6/2019, European Topic Centre for Waste and Materials in a Green Economy, European Environment Agency, Copenhagen (https://www.eionet.europa.eu/etcs/etc-wmge/products/etc-reports/textiles-and-the-environment-in-a-circular-economy) accessed 26 March 2020.

ETC/WMGE, 2021a, *Business models in a circular economy*, Eionet Report No 2/2021, European Topic Centre on Waste and Materials in a Green Economy, European Environment Agency, Copenhagen (https://www.eionet.europa.eu/etcs/etc-wmge/products/business-models-in-a-circular-economy) accessed 26 November 2021.

ETC/WMGE, 2021b, *Plastic in textiles: potentials for circularity and reduced environmental and climate impacts*, Eionet Report No 1/2021, European Topic Centre on Waste and Materials in a Green Economy, European Environment Agency, Copenhagen (https://www.eionet.europa.eu/etcs/etc-wmge/products/plastic-in-textiles-potentials-for-circularity-and-reduced-environmental-and-climate-impacts) accessed 28 April 2021.

European Commission, 2015, Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance) (2000/532/EC).

European Commission, 2022, *EU Strategy for Sustainable and Circular Textiles*, (https://environment.ec.europa.eu/publications/textiles-strategy_en) accessed 18 December 2022.

European Commission, n.d., 'Classification of goods', (https://taxation-customs.ec.europa.eu/business/calculation-customs-duties/customs-tariff/classification-goods_en) accessed 19 October 2022.

European Parliament, 2022, 'Sustainable economy: Parliament adopts new reporting rules for multinationals | News | European Parliament' (https://www.europarl.europa.eu/news/en/press-room/20221107IPR49611/sustainable-economy-parliament-adopts-new-reporting-rules-for-multinationals) accessed 30 November 2022.

Fashion for Good, 2022, *Sorting for Circularity Europe* (https://reports.fashionforgood.com/report/sorting-for-circularity-europe/) accessed 24 October 2022.

Fashion for Good, 2022, 'Sorting-For-Circularity-Europe_Sorters-Handbook_Fashion-for-Good.pdf' (https://reports.fashionforgood.com/wp-content/uploads/2022/09/Sorting-For-Circularity-Europe_Sorters-Handbook_Fashion-for-Good.pdf) accessed 28 November 2022.

Fashion For Good, F. for, 2022, 'Sorting for Circularity India: Wealth in Waste', Fashion for Good Reports (https://reports.fashionforgood.com/report/sorting-for-circularity-india-wealth-in-waste/) accessed 28 November 2022.

Garson & Shaw, 2019, 'Exploring the benefits of the growing Used Textile Recycling Industry located in the Karachi Export Processing Zone in Pakistan - Used Clothing Brokers | Garson & Shaw' (https://www.garsonshaw.com/2019/11/exploring-the-benefits-of-the-growing-used-textile-recycling-industry-located-in-the-karachi-export-processing-zone-in-pakistan/) accessed 28 November 2022.

International Trade Administration, 2022, 'Pakistan - Waste Management', International Trade Administration (https://www.trade.gov/country-commercial-guides/pakistan-waste-management) accessed 14 June 2022.

InTex, 2022, *Innovative Business Practices and Economic Models in the Textile Value Chain (InTex) Assessment of eco-innovation potential in the textile sector in Tunisia* (http://www.citet.nat.tn/Portail/projet-intex-innovative-business-practices-and-economic-models-in-the-textile-value-chain.aspx).

IntrepidSourcing, 2022, 'Garment Industry Report', Intrepid Sourcing & Services (https://intrepidsourcing.com/industry-reports/garment-industry-report/) accessed 28 November 2022.
Invest in Tunisia, 2013, 'Textiles | Invest in Tunisia' (https://www.investintunisia.com/textiles/) accessed 27 November 2022.

Kaledzi, I., 2022, 'Used clothes choke Ghana's markets, ecosystem' Deutsche Welle, Bonn (https://www.dw.com/en/used-clothes-choke-both-markets-and-environment-in-ghana/a-60340513) accessed 28 November 2022.

Khanna, P., 2022, 'Wealth in waste: India's potential to lead circular textile sourcing', *Textile Magazine* (https://textilevaluechain.in/in-depth-analysis/sorting-for-circularity-you-had-shared-a-questionnaire-with-me/) accessed 28 November 2022.

Kishco Group, n.d., 'Textile Recycling' (http://kishcogroup.com/service/textile-recycling/) accessed 28 November 2022.

Kohan Textile Journal, 2019, 'Textile industry in Tunisia', *Kohan Textile Journal* (https://kohantextilejournal.com/textile-industry-in-tunisia-2/) accessed 26 September 2022.

Kohan Textile Journal, 2021, 'TAYAL A Textile Giant in North Africa', *Kohan Textile Journal* (https://kohantextilejournal.com/tayal-a-textile-giant-in-north-africa/) accessed 28 November 2022.

Köhler, A., Watson, D., Trzepacz, S., Löw, C., Liu, R., Danneck, J., 2021, *Circular economy perspectives in the EU Textile sector*, Publications Office of the European Union, Luxembourg (https://publications.jrc.ec.europa.eu/repository/handle/JRC125110) accessed 18 December 2022.

Lifestyle & Design Cluster, 2022, *Research and identification of textile plants globally - focusing on fibre-to-fibre recycling for the fashion & textile industry*, Lifestyle & Design Cluster (https://ldcluster.com/wp-

content/uploads/sites/4/2020/01/fiber-to-fiber-textile-plants-publication-by-Lifestyle-Design-Cluster-komprimeret.pdf) accessed 30 November 2022.

Medina Textiles FZE, 2022, 'Secondhand clothes, shoes and garments experts', Medina FZE (https://www.medinatextilesfze.com) accessed 26 September 2022.

Mendes, A., Bertella, M., Teixeira, R., 2014, 'Industrialization in Sub-Saharan Africa and import substitution policy', *Revista de Economia Política* 34, pp. 120-138 (DOI: 10.1590/S0101-31572014000100008).

Ministry of Commerce, 2020, *Textiles and Apparel Policy 2020-25*, Ministry of Commerce, Islamabad, Pakistan (https://www.commerce.gov.pk/wp-content/uploads/2022/02/Textiles-and-Apparel-Policy-2020-25.pdf) accessed 18 December 2022.

MS Group Textiles, 2018, 'Second Hand Wholesale UAE' (https://msgroup-secondhandclothes.com/history/) accessed 26 September 2022.

Nørup, N., Pihl, K., Damgaard, A., Scheutz, C.,2018, 'Development and testing of a sorting and quality assessment method for textile waste', *Waste Management* 79, pp. 8-21 (DOI: 10.1016/j.wasman.2018.07.008).

Pham, P., 2017, 'How Asia Has Become The World's Manufacturing Hub', *Forbes* (https://www.forbes.com/sites/peterpham/2017/11/13/how-asia-has-become-the-worlds-manufacturing-hub/) accessed 28 November 2022.

Reverse Resources and Blumine, 2021, *Textile waste mapping of Morocco and Tunisia*. Deliverable DA.9 (final) under the UNIDO SwitchMed program, (https://reverseresources.net/news/textile-waste-mapping-of-morocco-and-tunisia-launched) accessed 26 September 2022.

Ricketts, L. and Skinner, J. B., 2019, 'Dead White Man's Clothes', *Atmos* (https://atmos.earth/ghana-kantamanto-clothing-waste-problem/) accessed 27 November 2022.

Sandin, G. and Peters, G. M., 2018, 'Environmental impact of textile reuse and recycling – A review', *Journal of Cleaner Production* 184, pp. 353-365 (DOI: 10.1016/j.jclepro.2018.02.266).

Simon, D., 2009, 'Structural Adjustment Program', in *International Encyclopedia of Human Geography*, Eds. Kitchin, R. and Thrift, N., Elsevier Science, Amsterdam (https://www.sciencedirect.com/topics/earth-and-planetary-sciences/structural-adjustment-program) accessed 25 October 2022.

SK Export, 2022, 'Second-hand & New Clothing Experts', SK Export | Secondhand & New Clothes Supplier in the UAE (https://sk-export.com/) accessed 26 September 2022.

Trzepacz, S., Lingås, D., Asscherickx, L., Peeters, K., van Duijn, H., Akerboom, M., 2023, *LCA-based assessment of the management of European used textiles*, EuRIC.

Sukkar, M., 2022, 'Dubai has just increased the cost of landfill. Can it hit zero waste by 2030?', *World Economic Forum* (https://www.weforum.org/agenda/2022/02/dubai-waste-recycling/) accessed 26 September 2022.

Sustainable Amor, 2020, 'Explaining Used Clothing Import Bans', SUSTAINABLE AMOR (https://sustainableamor.com/blog/explaining-used-clothing-import-bans) accessed 25 October 2022.

The Hindu business line, 2019, 'Textile industry asks Govt to ban import of used clothes from China, Bangladesh and Indonesia', The Hindu, Chennai (https://www.thehindubusinessline.com/economy/textile-industry-asks-government-to-ban-import-of-used-clothes/article29750028.ece) accessed 28 November 2022.

The UAE Government, 2021, 'Waste management' (https://u.ae/en/information-and-services/environment-and-energy/waste-management) accessed 27 November 2022.

The United Arab Emirates' Government portal, 2021, 'Waste management', Waste management (https://u.ae/en/information-and-services/environment-and-energy/waste-management) accessed 26 September 2022.

United Arab Emirates Ministry of Economy, n.d., 'Free Zones', (https://www.moec.gov.ae/en/free-zones) accessed 26 September 2022.

Watson, D., Palm, D., Brix, L., Armstrup, M., Syversen, F., Nielsen, R., 2016, *Exports of Nordic Used Textiles. Fate, benefits and impacts*, Tema Nord No 558, Nordic Council of Ministers (http://norden.diva-portal.org/smash/get/diva2:1057017/FULLTEXT03.pdf).

Watson, D., Aare, A.K., Trzepacz, S., Dahl Petersen, C., 2018, *Used textile collection in European cities. Study commissioned by Rijkswaterstaat under the European Clothing Action Plan (ECAP)* (http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities_full-report_with-summary.pdf).

Kohan Textile Journal, 2019, 'Textile Industry in UAE', Kohan Textile Journal (https://kohantextilejournal.com/textile-industry-in-uae/) accessed 26 September 2022.

European Topic Centre on
Circular economy and resource use
https://www.eionet.europa.eu/etcs/etc-ce

The European Topic Centre on Circular economy and resource use (ETC CE) is a consortium of European institutes under contract of the European Environment Agency.

European Environment Agency
European Topic Centre
Circular economy and resource use