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GIF Green Innovation in the Fashion industry management

GIF Green Innovation in the Fashion industry – Task 1.1

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INTRODUCTION

The role of this task is to highlight the trends of the international fashion system and the textile system.

The world situation in the sector is very complicated. After two years of pandemic, there is an unstable situation due to the war. All this has created a process of stagflation. The sub-fund has suffered the following cost increases:

1. Fuels;
2. Raw materials, up to 25% increase.

In addition, already since the pandemic, the transport and logistics system has gone completely haywire. Favoring only companies that have produced materials with a km 0 approach. This will lead the market to activate more sustainable policies, as it will cut costs for import-export given above all the risk of not being able to obtain the raw materials necessary for operational activities.

In the short term, even at the level of the European Commission, there are approaches to giving up policies related to the Green Deal for "market" reasons. For example, in the agricultural field, there are referents who propose to re-use territories and fertilizers; therefore, increased territorial intensity and use of chemical materials to overcome the demand for grain. Such an approach will only lead to worsening the situation in terms of the environment and sustainability and not to changing the model of approach to the market.

That is why there is a strong debate on this in the Commissioners of the EC, with large splits, which are also being highlighted at the public level. The Green Deal has never been so endangered. So also, for the skills to be trained and codified with this project, they risk being questioned for a superficial observation that the market requires something else.

Instead, different skills in terms of environmental sustainability and change, not only of production, but of distribution and import can improve both the environment and the market.

In the next paragraph, research on the sector and precise analysis on how sustainability and independence are factors of market evolution, and specifically of the fashion-textile sector, will be presented.

In the last paragraph, two pilot countries in the reference sector will be analysed. We chose Spain and Germany, as mature markets and heterogeneous countries. All the procedures activated in that market were analyzed. The first part highlights all the CPVs (common procurement vocabolary) used with the selected specific dictions. The importance of the market in terms of amounts will be highlighted and at the end the major players on the market will be highlighted.

On these subjects, even if not within our competence, we consider it interesting to administer questionnaires on the approach to environmental sustainability.

For this scenario analysis we used the Tool TENDERBLADE. A quantitative tool to analyse the markets and create a new data with the major players in the market and with the victories obtained in the sector to which they belong. The intent is in addition to the data that can be found from a desk search on official documents, to bring out data that are not the official ones but that are relevant as they identify turnovers and victories of the major players divided by the various countries.

Tenderblade Tool

The TENDERBLADE tool is supported by an algorithm that has been managing time series since TED's 2012. The matching with the needs of the dossier takes place through the direct query of the database. The XML files that will flow into the database are those that the TED platform makes available as "bulk downloads" and available on the internet. TENDERBLADEwill use these bulk downloads to create its own database, divided by years, in the form of files called database_aaaa (aaaa indicates the reference year).
The tool uses auxiliary programs and resources to make search and usability better.
TENDERBLADE is an application that to query xml databases, needs the following additional programs:

1. **JAVA -** Developed programming language and processing platform

2. **BERKELEY DB XML -** Database produced by Oracle, created to manage xml files natively

At the resource level, the following are used:

1. **WORDNET** - Lexical database

2. **CPV code table -** Ssingle classification system for public procurement aimed at unifying the references used by contracting authorities and entities for the description of the subject matter of contracts (9,455 items)

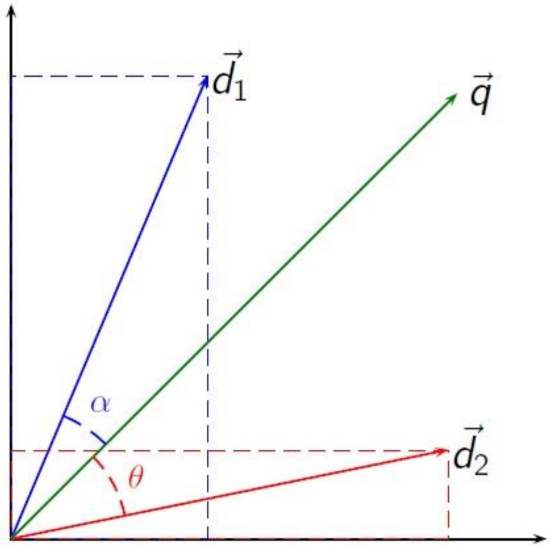
The analyses are also developed through semantic analysis in TED and, of the tender specifications, in order to clarify the requirements and the individual activities required.

Some essential notes on textual research, to better understand the process.
As for the 'information retrieval', which is the theory that underlies the tool, every document, every text, etc. is simply a list of words ("bag of words"). You then lose all the information regarding the word order, syntax, etc. A query, through the usual Boolean operators, selects from an archive the documents that contain the terms of the query, according to the specifications of the Boolean operators.

We define corpus as the set of documents retrieved from an archive following a query.
How is the corpus documents scored?
The documents of the corpus are represented through vectors in a vector space. Each word of the corpus represents a dimension of space.
Example: 2 documents
First document: "The house is big"
Second document: "The entrance hall of the building is dirty."

The vector space of the corpus formed by these two documents has dimension 9 (because the distinct terms are 9: the, house, is, large, the, entrance hall, of, palace, dirty). Each of the two documents is therefore a vector in this 9-dimensional space. But each vector is specified by its coordinates with respect to dimensions. How do I assign coordinates?
The coordinates are assigned according to a glocal model (local and global).
The coordinate of a particular term is the product of the frequency of the term in the (local) document for the inverse of the frequency of the term in the corpus. So the coordinate (or weight) increases if the term is very frequent in the document (which is obvious) but also if the term is rare in the corpus (because on the contrary if it were frequent even in the corpus it would not serve to distinguish one document from another: the idea is that a term very present in the corpus is not very significant).

As anticipated earlier, if we consider texts as simple lists of words, then even our question, if we do not consider the Boolean operators, is a list of words, and therefore can be represented as a vector in the vector space generated by the corpus. In our specific case we will have three vectors, one for each document, and one for the question. The score expresses the degree of similarity of the document vectors with the query vector.
For a summary analysis like this we can define that the similarity between two vectors is inversely proportional to the angle between the two: the larger the angle the farther the vectors are from each other so the document and the query are different (low score to the document), the more the angle is similar the more the vectors are similar (high score to the document).



The previous image is two-dimensional for obvious reasons of representation, but as far as our reasoning is concerned, document d1 is more similar to query q than document d2 is.

Consequences of scoring

If the similarity depends on the angle between two vectors and the vectors by their coordinates, we can say that the similarity of the vectors is a function of the coordinates. But if we remember that the coordinates are determined by a glocal model (where the corpus also plays an important role) we can say:

1. The score is a relative value, not an absolute one. 1000 is not a high score and 0.5 is not a low score. But if in the same research a document has a score of 1000 and another has a score of 0.5 we can only say that in that corpus the first document is more similar to the question of the second.
2. You cannot compare the scores of documents made with different research, because the corpuses are different. In summary, different search scores are NOT comparable;
3. The score expresses the similarity of the document found with the question (so to understand the score you must ALWAYS have in mind the form of the question) and for our intent it is NOT said that a low or relatively low score indicates a document that is not relevant.

FASHION-TEXTILE MARKET AND SUSTAINABILITY TRENDS

The fashion-textile market has suffered a reduction in supply and an endemic difficulty in production, due to the increase in prices for energy and raw materials. These factors are imposing changes in both the production and the obtaining of raw materials. In some cases, changing supplies trying to stock up on raw materials per km. 0. This trend is changing the whole market, also changing the convenience of using raw materials with costs that are no longer advantageous, from non-EU countries with also different policies for safety and quality of work in addition to respect for the environment.

On trends we report some excerpts from the analysis of "The state of fashion 2022" by McKinsey[1], where they identify 10 elements for 2022. Obviously, the analysis was closed in 2021 and therefore suffers from the exogenous factor of the war. But some important ideas, the first on the condition of the supply chain, because:

The last two years have been a challenge for fashion. Consumer behavior has abruptly changed, traditional supply chains have suffered disruptions, and three-quarters of textile companies have seen their revenues fall by nearly 90%. As the consequences of the pandemic continue their unpredictable progress, the main agreement that emerges from the study is to ensure the recovery of the textile sector during the next year.

Instead with regard to development trends, the following trends are relevant:

Uneven recovery

Despite the initial situation, the report states that the fashion industry is set to recover during 2022. Although, this recovery is expected to evolve unevenly depending on the territory. Countries with strong and resilient economic systems will tend to better recover from the stresses caused by Covid-19. While China has already reached pre-pandemic sales levels, the United States is close behind. However, Europe is progressing at a slower pace as a result of pressures from supply chains.

To balance this uneven recovery, international companies must be rigorous in their investment decisions, looking for alternatives that allow them to make their supply systems more flexible and reduce market risks.

Logistics gridlock

The fashion industry depends on a complex network of supply chains that are in a critical situation. 87% of people surveyed expect that raw material shortages, transportation bottlenecks and rising logistics costs may lead to lower profit margins over the next year.

With logistics gridlock and insufficient resources, brands will have to balance the speed of trade with the need to relieve pressure on the supply chain. This can mean accelerating production and planning, as well as putting contingency plans in place. At the same time, brands must work with their suppliers to reinvent the supply chain through efficient supply management to strengthen production capacity and protect access to raw materials.

Circular textiles

One of the most important levers of change in the fashion industry to reduce its environmental impact is closed-loop recycling. A system that is beginning to be implemented at scale and that also promises to limit the extraction of virgin raw materials and reduce fashion waste. Fact that takes on special relevance with the imminent entry into force of the waste law in Spain.

As the popularity of circular materials increases in the fashion industry, companies will need to integrate them into the product design phase while adopting large-scale collection and sorting systems. The deployment of industrial processes will reduce prices over the next few years and boost demand for garments made from circular materials.

[1] https://www.mckinsey.com/industries/retail/our-insights/state-of-fashion

To maintain a competitive advantage, brands may require a direct investment in recycling facilities. Considering that increasing scale will mean higher capital spending, brands will need to look beyond the comparatively cheaper costs of virgin materials.
While there is an optimistic view that many closed-loop technologies will reach industrial scale in 2022, fashion leaders will need to address the challenge globally, incorporating circular textile solutions in a wider dimension. If the industry wants to significantly reduce its levels of environmental damage, fashion will also need to eliminate toxic chemicals, decarbonize the supply chain and reduce emissions.

Three of the ten trends are among the themes that affect the project and that lead to those elements underlined in the premise of this report. The sustainability aspect linked to the recycling of the material is also relevant. On this the five points of BCome[2], where they define the various steps are part of the priorities of the project.
The solution starts with learning how to produce and consume responsibly and circularly.
Stage 1: Assess the level of risk of circularity in each material, process and logical system used.
Stage 2: Avoid and replace processes, materials and logistics systems not suitable for circularity.
Stage 3: Reduce any processes, materials and logistics systems that are not suitable for circularity.
Stage 4: Regenerate according to market alternatives.
Stage 5: Lead the consumer towards a change in their model of consumption.

Moving instead on the side of sustainability, we have taken up some of the scenarios that are most relevant in the world context after the beginning of the war. These approaches highlight how essential it is to keep clear the importance of the concept of sustainability and not to be carried away by the difficult context in which we are living.
Relevant in this case The Sustainable Global Supply Chains Report 2022 by the INSTITUT FÜR WELTWIRTSCHAFT KIEL (KIEL INSTITUTE FOR THE WORLD ECONOMY). In this report it is stressed
Global supply chains affect the economy, the environment and social welfare in many ways. Worldwide, economies are experiencing global supply shortages today, affecting key industries such as automotive and consumer electronics as well as vaccine and medical supplies industries.
These preoccupy policymakers, who are debating independent national production capacities and restrictions on international trade, but also large companies, which consider reshoring production and abandoning just-in-time procurement. At the same time, the greening of the global economy requires a restructuring of global production to massively decrease its environmental footprint. This creates new supply chain challenges – how to move towards circular economies and how to reorient energy-intensive industries towards renewables and green hydrogen, for example.
And let's not forget: Consumers are increasingly demanding higher social and environmental standards. Transparency requirements and binding due diligence obligations will in particular affect countries that export raw materials and labour-intensive goods produced under problematic environmental and social conditions.

What is analyzed in the report, also highlights for the market that we are analyzing how much it has created very negative impacts on the whole market. The report, among the various nodal points, inserts the aspect of how the crisis can lead to a change in the supply chain system, leading to the analysis of hypotheses of regional approaches and therefore that indirectly reduce environmental impacts.
Still on the very stringent theme, although with a focus on the supply chain system that has entered into crisis with the pandemic, we make a brief reference to Bruegel's paper "Knowledge flows and global value chains" where the authors analyze the entire production system and how it is necessarily changing after the effects of the pandemic.

[2] https://bcome.biz/blog/on-the-road-to-circularity-5-steps-every-company-needs-to-take/

Finally, as the last elements on the analysis of the crises (pandemic – war) that are changing the world market, we report two interesting papers, indirectly, to understand the market level we are facing. The first report by the College of Europe entitled *The importance of debt in the response to crises in the EU* .

This study analyses speeches from the EC and the European Central Bank (ECB) between 2010 and 2020 to see whether there is a shift in the views on debt expressed in these discourses. It is found that these views have changed and it could be part of the explanation for the different reactions to the eurozone and Covid-19 crises.
While, the study by WIFO, with the title *Macroeconomic effects of green recovery programmes: conceptual framing and a review of the empirical literature*, is fitting for how the events we are experiencing lead to a review of the expected objectives including approaches to sustainability. In this report
The authors examine the effectiveness of green recovery measures not only with regard to environmental objectives, but also concerning conventional economic indicators with a review of macroeconomic empirical evidence.

THE SCENARIO FOR THE PARTNERS OF THE PROJECT

Each partner identified their own scenario, based on the data highlighted by them, they focused as described in the approved project on the sustainability factors of the market.
Let's start with the major trends in the partner's country. In Italy, reflections develop according to two main observations. The first concerns how relevant the sense of environmental sustainability is for consumers.

ITALY

Indeed based on research data from a survey carried out by the Piepoli Institute, sustainability is no longer a niche topic but is increasingly important for consumers.
For what concerns private citizens' life, despite increased interest in sustainability, only 41% of respondents said they were sufficiently informed about renewable energy and only 47% said they want an eco-friendly car. 53% of the sample claimed to follow a sustainable lifestyle, mainly associating this with recycling and waste reduction, but on the other hand, only 10% of respondents use renewable energy, choosing to install photovoltaic panels at home.

As for organisations, SMEs play a fundamental role in carrying on sustainability principles. They are increasingly being recognised for their commitment to a more environmentally responsible and sustainable approach. The move has led to greater transparency and focus on the green credentials of all processes and to the emergence of exciting innovations.

A circular economy, waste management, responsible sourcing and an ethical production chain are all key drivers in the Italian fashion industry. The companies leading the market are increasingly those that track their supply chain, use machine learning to measure the environmental impact of production and harness renewable energy to power their production.
Green processes and fair labour are taking a central stage.

In an other hand, it's relevant to highlight the importance of eco-innovation policy in Italy.

The 2019 Eco-Innovation Index ranks Italy as 8th, right after the index's leaders. While performance is 12% higher than the EU average, scoring at 112, Italy has nonetheless regressed by 1.2 points compared to 2017. Italy shows best performance in resource-efficiency outcomes with 178 points, where the country ranks fifth after Luxembourg, Malta, UK and Ireland. The country's performance in eco-innovation activities, eco-innovation outputs and socio-economic outcomes is just above the EU average. The worst performance of the country is in eco-innovation inputs, where the country ranks well below the EU average with 69 points.

The overall good performance of the country on eco-innovation reflects the efforts made to develop and implement policies dedicated to eco-innovation and circular economy. Circular economy and eco-innovation developments in Italy largely relate to eco-labelling, waste management, bioeconomy and green industry. In fact, Italy has one of the highest levels of eco-labels and EMAS in the EU. According to the 2019 Report on circular economy in Italy, the country ranks first on waste management performance. Italy is also a leader in bioeconomy, especially in the food and beverage sector. In addition, circular economy is increasingly becoming an important component of the country's industrial policy.

According to “The new fashion trends in Italy: Made in Italy between sustainability, online fashion and rented clothing” published in 2022 by Rome Business School, a post-university training institute part of the Planeta Formación y Universidades network created in 2003 by De Agostini and the Planeta Group:
- Since the start of the pandemic, 45.5% of Italians have limited their purchases of non-essential goods: in the North this percentage is 39.6%, in the Center 42.1% and in the South 56.8%.
- Online shopping is growing all over the world: the propensity to buy clothing online has reached the historic rate of 43%.
- In Italy, 85% of digital shoppers make on average at least one online purchase per month, a value 5 points higher than that recorded in 2020.
- After electronics items, the “fashion and accessories” segment is the most popular for online purchases, especially knitwear (51.3%), coats and down jackets (39.3%), women’s shoes and dresses (35.9%), pants (32.1%), jackets, and suits (15.8%).
- Under sustainable fashion, the most searched products on the web are sneakers (+142%) and denim (+108%), growing demand for reused jewelry (+90%) and ethical jewelry (+60%).
- Searches for eco-friendly fabrics such as organic cotton and recycled plastic derivatives are on the rise (+35%) and those for leather and fur are down (-8%).
- 66% of Italian consumers would like fashion brands to take a stand on sensitive issues and more than 58% believe it is important for them to do so on social media.
- The global business of “second-hand” products will increase between 15% and 20% until 2026.
- 40% of under-24s buy used clothing, an industry valued globally at $33 billion, the rental fashion market will touch $1.9 billion by 2023.

In general, Italian research reached a level of excellence at EU scale and worldwide in the sectors aimed at **fighting the desertification process and at mitigating the impact of Climate changes**.

Moreover, the active role played by the Italian research bodies in implementing the sustainability of processes in the **manufacturing** sector has allowed Italy to improve its international competitiveness, and to be one of the leading country in the green economy thanks to the wide use of **renewable resources**, the reduction of greenhouse **gas emission** and the development of **advanced technologies for de-manufacturing, recycling and re-use of industrial wastes**.
For what concerns the **fashion industry**, the move has been driven by Italian consumers who are unwilling to choose between cutting-edge fashion and ethical buying. The result has been a surge of creative innovations. These include a new material created from a citrus fruit by-product in Sicily, clothes dye manufactured from automotive and aerospace waste products in Turin, nylon made using fishing nets in Trentino, as well as alternatives to the notoriously damaging manufacture of denim.
Accountability and guarantee of responsible origin in the production chain has become a key concern in the Italian fashion industry, and **advanced tech is being used to increase transparency**.
21 Top Sustainability Startups and Companies in Italy (2021), **mainly focusing on:**

- cross-cutting competencies for Additive Manufacturing in terms of material science, process engineering
- Sustainable Luxury solutions for the High End Industry
- AI to predict soil’s moisture and help farmers saving water.
- smart and reusable packaging for food and beverage industry.
- social platform rewarding citizens, customers and employees’ for their sustainable actions and positive impact

- social network helping farmers to grow vegetables in their own organic gardens
- development projects for virtual smart grids and energy management platforms.
- sustainable farming practices like vertical farming, hydroponics, etc.
- transformation of natural resources into innovative products.
- travel platform that allows clients to compare sustainable hotels prices provided by leading reservation systems.

Fields associated with sustainability in Italy 2019
- environment,
- renewable energy
- recycling were the most common fields associated by Italian respondents with the term "sustainability". Moreover, another survey from the same year showed that interviewees in Italy perceived waste disposal and air pollution as the most relevant problems related to the environment in the country.

GERMANY

The trend in Germany covers various aspects of the industry, which for convenience, the partner has differentiated as follows.

Focus on Health and Well-being
Health has not just been an important trend topic since Corona. For years, textile manufacturers and brands have been experimenting with health-promoting properties of clothing, for example through integrated nanocapsules that care for the skin and improve regeneration, or through intelligent threads that act as sensors, data conductors and power suppliers to generate heat over a wide area or measure moisture, pressure points and temperature.

- ☐ Company example: https://www.pyratex.com/

Rental services and second-hand fashion for a smaller ecological footprint
The second-hand market has been growing for years. Almost 1/3 of Germans buy second hand clothes regularly (at least every 3 months) (https://momox.biz/images/Pressemitteilungen/2020/ubup_sh_fashion_report_2020.pdf). More and more brands and retailers are investing in new resale business models and offering second-hand goods alongside their regular collections. The same applies to rental services. In recent months, numerous retailers and brands have launched the new service.

- ☐ Development of mentions of slow fashion, second-hand clothing and haute couture in public posts in German from Twitter, Reddit, Instagram, various blogs and forums: https://www.brandwatch.com/de/reports/fashion-trends-2021/view/

Reducing resource consumption with a circular economy
At present, there are only a few brands that are seriously concerned with circular economy. This is mainly due to the very complex system that requires the entire value chain to pull together, all the way to the disposal facility. It's not enough to use recycled materials in manufacturing; the finished product must also be recyclable at the end of its life. Either because mono-material was used or because the individual parts can be easily separated from each other. However, the more robust and durable the products are, the more difficult it is to achieve the recyclability of the components. Biological cycles - i.e. composting - are also an option and are already being tested.

Plant based materials

Leather processing, for example, is one of the most environmentally damaging processes in the fashion industry. Vegan leather made from PVC is animal-friendly, but by no means more ecological. That's why plant-based alternatives are being researched. For example, some labels are researching the development of a "leather" made from mycelium. The root network of mushrooms grows in the laboratory and needs no water and hardly any electricity.
The swiss running shoe brand On is tackling the problem with "Cyclon." The innovative running shoe is made from A to Z from a material derived from beans and is 100% recyclable over and over again. Since On relies on the return of used shoes to make this principle work, it's only available by subscription.

- ☐ Example brand ON Cyclon (One Material Shoe): https://youtu.be/_tb8gBJjKmc

As in Italy, in Germany there is a clear trend among consumers toward more sustainability too. Customers are demanding less "throwaway fashion" and instead opting to buy fewer, higher-quality items. This trend will benefit the German fashion industry through quality advances. Germany also has a good recycling infrastructure (a wide variety of large online clothing swap exchanges, used clothing containers for clothing donations).
Accordingly, the topic of recycling and the circular economy is particularly interesting for Germany. Across Germany, there are 16 textile research institutes that are continuously developing high-tech textiles and new efficient and sustainable production processes. Bringing these research results to the fashion and textile companies is an important adjusting screw towards green innovation.

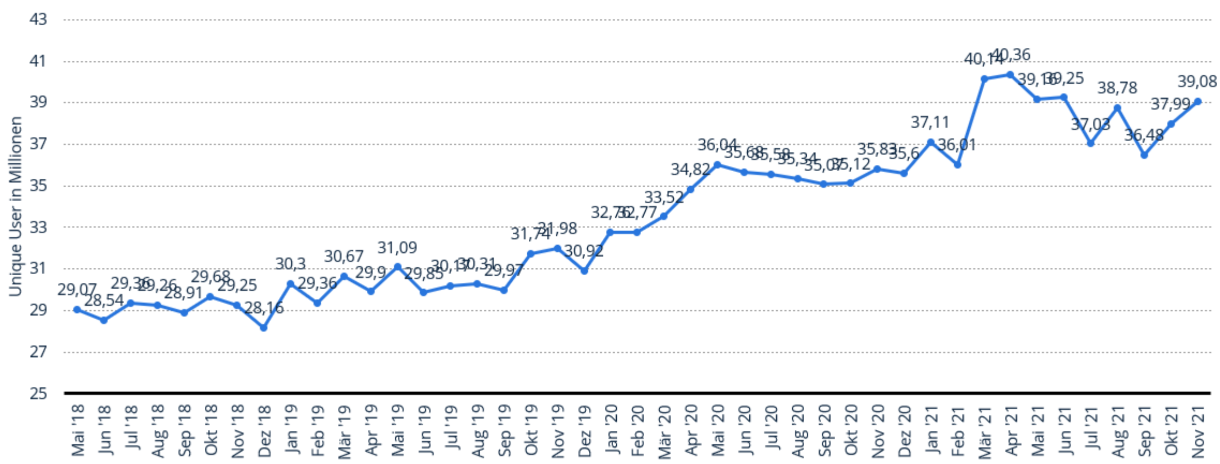
Current research projects: https://textil-mode.de/media/original_images/2022/07/25/laufende-vorhaben-gesamt.pdf

Below, two graphs of trends detected by the partner, through some national sources such as the study on the Status of German Fashion 2021 sponsored by the German Federal Ministry for Economic Affairs and Energy: https://www.bmwk.de/Redaktion/DE/Downloads/Studien/status-deutscher-mode-2021.pdf?__blob=publicationFile
SLOW FASHION MONITOR 2021 Germany

Population-representative survey on current attitudes, shopping behavior as well as brand consumption and evaluation: https://www.splendid-research.com/downloads/studien/Studienflyer-Slow-Fashion-Monitor-2021.pdf

Number of unique users of eBay Classifieds from May 2018 to November 2021 (in millions)

Unique User von eBay Kleinanzeigen bis November 2021

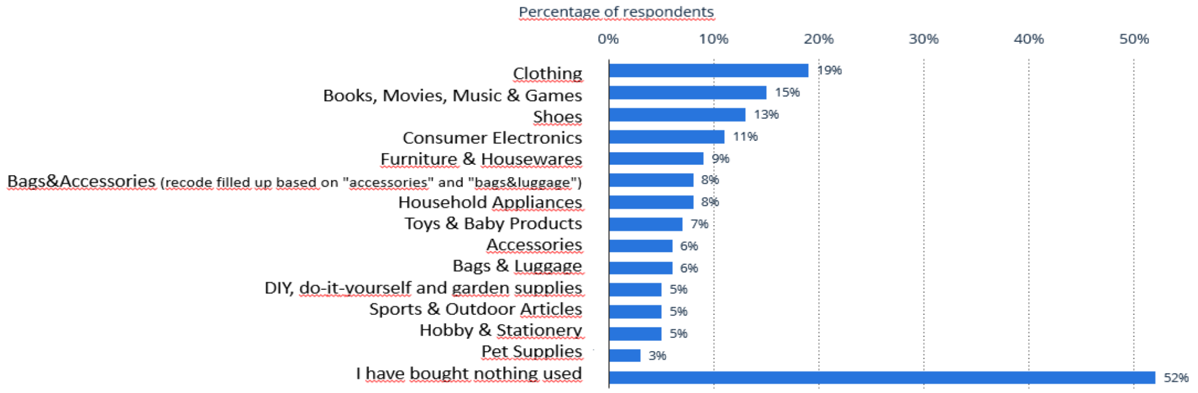


21 **Beschreibung:** Im November 2021 hatte das digitale Gesamtangebot von eBay Kleinanzeigen laut agof 39,08 Millionen Unique User. Im Vergleich zum Vormonat ist damit die Anzahl der Unique User von eBay Kleinanzeigen um rund eine Million gestiegen. Mehr
Hinweis(e): Deutschland; agof daily digital facts 26.01.2022; Nutzer stationärer und/oder mobiler Angebote letzte 3 Monate ab 16 Jahren (n=279.787 ungew. Fälle)
Quelle(n): agof

statista

Second-hand purchases by product category in Germany in 2022

Second-Hand-Käufe nach Produktkategorie in Deutschland 2022



5 **Beschreibung:** Diese Daten zu Second-Hand-Käufen nach Produktkategorie zeigen Ergebnisse des Statista Global Consumer Survey in Deutschland im Jahr 2022. Etwa 19 Prozent der Befragten beantworteten die Frage "Welche dieser Produkte haben Sie in den letzten 12 Monaten gebraucht gekauft (online oder stationär)?" mit "Bekleidung". Mehr
Hinweis(e): Deutschland; vier Wellen zwischen 1 April 2021 und 17 März 2022; 4524 Befragte; 18 bis 64 Jahre
Quelle(n): Statista Global Consumer Survey (GCS)

statista

GREECE

In Greece the trends are divided in some topings. In this section the partner decided to create a brief for any single topic.

Fashion on a budget.

The rise of thrift fashion, or the purchase of used clothing, stems from the desire to save money on clothing while promoting an anti-waste culture. Sustainable fashion advocates have begun to fully embrace the purchase of thrift or second-hand clothing, rejecting the notion that wearing thrift lowers one's social status.

Minimalism and capsule wardrobes are popular.
People are looking inward to get a minimalist closet to reduce overconsumption and clothing junk. As a result, the fashion industry and clothing manufacturers have responded by producing less unnecessary clothing and using more general colors to produce apparels, keeping it to a bare minimum.
Recycling and repurposing
Upcycling is a relatively new trend in the fashion industry, as recycling is. This entails transforming old fabrics and reusing them in the production of new clothing. It helps to reduce waste by repurposing materials that are no longer in use for newer garments.
Rentals
Many fashion industries have begun to provide the option for rentals in response to the recognition of a pattern in which most women only use clothing on specific occasions, after which it is no longer to be worn.

Environmentally friendly clothing
Many brands are investing in environmental protection campaigns by donating proceeds from eco-friendly clothing purchases to carbon-reduction projects. This is in conjunction with the use of biodegradable materials during manufacturing as well as fabric recycling, which leads to a reduction in chemical treatment and material processing.
Greece, together with Malta and Romania, is among the EU countries with the lowest recycling rates, with 17% recycling or composting. This situation may be caused by the competent bodies, the lack of information and the 'mentality' of the Greek people, which is anything but ecological. In countries such as Belgium, Denmark or Sweden, only 1 % of the waste that ends up in landfills while 48% is recycled. [Euro2day, 2018]. The following waste management companies are trying to reduce this problem clothing waste management in Greece. **RECYCOM** places the recycling bins for clothes and shoes in public places, such as schools, town halls, etc. The clothes are regularly collected by RECYCOM staff and stored in warehouses for handling and shipping purposes abroad. The recycling and management programme for used clothing and footwear of the Recycom has so far been adopted by 46 municipalities and 11 businesses/organisations across the Greece (2020).
EAST WEST GREECE has been active since 2015 in Northern Greece (mainly in the prefecture of Thessaloniki), in the field of recycling of clothing and footwear. Through its cooperation with municipalities, it sets the basis for a clean and sustainable environment as all its actions are oriented towards the use of our natural resources with respect and love. Similar to RECYCOM, they collect clothes and shoes, of which the excellent quality items are distributed to the needy through the municipalities' clothing bank while the rest goes the way of recycling. Indicatively, during 2018, the used clothes and shoes collected - by the municipality of Thessaloniki alone - exceeded 400 tons.
In addition to private companies, there are also craftsmen in Greece that process clothing waste through mechanical recycling. For the last 23 years, a craft company that makes hosiery in Kaminia has been producing 90% of its products from recycled fabrics: clothes that are completely useless, torn, stained or faded. The company's warehouses collect around 1,000 tonnes of unwanted clothes every year. All the textiles collected are first scraped.
Stripped of buttons and elastic, they are put into a special machine and a comb combs them until they are until only the fibres are left, which are then knitted and in this way the first used in garages, industries and ships. However, the this process is time-consuming and costly. Among the wide range of products that the company's product range includes sails, rags, towels, kitchen paper, towels, etc.
Generally according to the National Strategy for the Circular Economy

The new Action Plan supports the transition to a sustainable development model with clear objectives and actions that will lead to their achievement. With regional and local authorities, businesses and consumers as allies, we are coordinating the country's efforts to reduce waste, increase the reuse and recycling of products, create a market for secondary materials and waste as a productive resource, increase the use of alternative fuels, reduce the use of hazardous substances and promote circularity in production processes.

The Greek partner has named Romania as an unsustainable nation in the impacts to sustainability. Now let's analyze them. The Romanian partner also divided the analysis into various topics.

ROMANIA

Second-hand fashion
Thanks to millennials (Generation Y, born between 1981 and 1996) and Generation Z (those born between 1997 and 2012), the words "second-hand" have lost negative connotation and became trendy and positively viewed. Thanks to their reinterpretation of fashion, this market sector has grown amazingly in recent years, helping many people to make significant savings.
Nowadays, clothes worn or bought and not yet worn are sold in second-hand shops, but also on online platforms or Facebook groups, directly by those who own them, with many fashion consumers also being resellers. Marketplace sites now facilitate the sale of everything from fast fashion to high-end luxury goods or vintage items.
Another environmentally friendly development is the clothing rental market, where fans of brands can wear designer outfits without paying hundreds of euros. (https://www.hunedoararecicleaza.ro/2022/05/18/romania-eco-friendly-5-trenduri-sustenabile-pe-val-la-nivel-mondial-castiga-teren-si-la-noi-in-tara/)

Corporate Non-Financial reporting
Non-financial sustainability reporting has become more and more prevalent in Romanian companies. According to a study, over 43% of responding companies with less than 500 employees already report non-financial issues. Of companies with more than 500 employees, 85% of respondents publish a sustainability report/non-financial statement. Hand-in-hand with this trend comes sustainability planning in companies, with more and more of them creating climate impact plans and goals to optimize production and reduce their CO2 impacts. (https://www.ey.com/ro_ro/news/2020/9/studiu-ey-romania--sustenabilitatea-va-juca-un-rol-important-in)

Renewable energy
Installing photovoltaic panels on households, public institutions, business centres, and production facilities has become popular in light of the EU 2030 directive on producing 45% renewable energy across all sectors. Romania is forcing all retail centres and public institution buildings over 250 sqm to supply from renewable energy. The government offers a 4.000 Euro incentive for users who want to install photovoltaic panels on their building (no matter the size or building type), as well as offers the possibility to become a prosumer (generate extra energy that is fed back into the system for monetary gain). (https://stirileprotv.ro/stiri/actualitate/panourile-solare-vor-fi-prezente-pe-fiecare-cladire-publica-si-in-spatiile-comerciale-din-romania-tinta-comisiei-europene.html)
On another hand, electric cars have become very popular due to the increase in charging infrastructure and rise in popularity of ride-sharing apps like Uber or Bolt (as well as the rise of

gas prices). The Romanian government offers the biggest monetary incentives for electric cars in Europe (10.000 Euro for a new fully electric car and 4.000 Euro for a hybrid one) (https://www.expertulbanilor.ro/programul-rabla/rabla-plus-subventii-pentru-masini-electrice/).

Bio-packaging and SUP alternatives
Since the EU ban on SUP items, supermarkets, restaurants, bars and event planners have turned towards biodegradable and more sustainable alternatives to replace traditionally disposable plastic items like bags, cutlery, cups and food packaging with sustainable alternatives (even if the single-use version is not banned yet – like bags or cups). This attitude is also encountered also in take-away packaging provided by restaurants and in events/festivals where the accent is put on reusing. (https://www.zf.ro/supliment-zf-green-economy/cand-dispar-din-magazine-articolele-de-plastic-de-unica-folosinta-20042675)
In general terms of sustainability, the production of renewable energy seems to have a potential to truly minimize the impact on the environment, as many households are adopting them In fear of the rising prices of energy as a consequence of the COVID-19 pandemic and the Ukraine war. Having the ability to become a prosumer – earning money instead of spending it on energy – is a great incentive for Romanians (especially since market and utility prices are rising while salaries stay the same) that assures them financial and environmental sustainability in terms of energy usage.

As for the fashion sector, consumer trends show that sustainable fashion has become increasingly popular and Is implemented in various ways by the consumers into their lifestyle: purchasing second-hand, creating their own garments or altering existing ones, choosing to buy from local boutiques or looking for international brands that have sustainable values. According to a study performed in 2021, since the COVID-19 pandemic, interest for sustainable fashion has risen considerably across the Romanian fashion market, with 53% of brands saying that this is the strongest trend in the last period. According to the same study, 60% of Romanians are willing to pay more for a sustainable item. (https://www.retail.ro/articole/stiri-si-noutati/interesul-pentru-moda-sustenabila-in-crestere-ce-articole-prefera-romanii-3644.html)

SPAIN

At the end we insert the analysis from the partner in Spain. Spain is making progress towards sustainability, it is the first country in the EU to adapt national plans to combat climate change according to the Planning for Net Zero Emissions Report, 2019 of the European Climate Foundation.

Companies have begun to assume their role as key players in sustainable development and the achievement of the 2030 Agenda, incorporating sustainability into their own business strategies and turning challenges into new business opportunities. Once again in 2020, the Spanish Network of the Global Compact is once again positioned as the first local network in the world in number of adherents, which confirms the commitment to society of Spanish society and companies.

In 2017, ICEX Spain Export and Investment joined the Spanish Network of the Global Compact, promoting sustainability as a vector of business competitiveness and a tool for internationalization and investment attraction, as well as promoting and making visible the work of Spanish companies in achieving the goals of the 2030 Agenda.

The main sustainability regulations applicable to companies operating in Spain are:

- Non-Financial Information and Diversity Law:

On December 29, 2018, the Non-Financial Information Law (Law 11/2018) came into force, as a result of the definitive transposition of the 2014 European Directive. Spain has adopted this regulation with important extensions regarding the obliged companies, the data that must be published and other format requirements that the Directive left as optional or recommended. The Law includes the Sustainable Development Goals, the United Nations Global Compact and the Paris Agreement as frameworks that organizations can rely on to prepare their non-financial reports.

- Capital Companies Law:

With the approval of the Non-Financial Information Law, the Capital Companies Law is modified with the aim of developing diversity policies for companies that improve the presence of women on the Board of Directors.

- Public Sector Procurement Law:

Within the "Europe 2020 Strategy", whose intention is to achieve intelligent, sustainable and inclusive growth, various initiatives arise to involve the public area in business practices. In Spain, Law 9/2017, of November 8, on Public Sector Contracts contemplates the incorporation of new social and environmental criteria in a transversal and obligatory way in multiple areas of the public contracting process.

- Equality Law

Royal Decree-Law 6/2019, in force since March 8, modifies Organic Law 3/2007, of March 22, on equality, including companies with more than 50 workers in the obligation to implement a Plan of Equality.

- Draft National Plan for Adaptation to Climate Change (PNACC) 2021-2030

for a country more resilient to the impacts of climate change. A tool whose main objective is to build an economy and a society that is less vulnerable, safer and more resilient to the impacts of climate change risk. For the first time, within the framework of the PNACC, a system of indicators of impact and adaptation to climate change will be defined and risk reports will be prepared periodically.

In the European report "2019 Europe Sustainable Development Report" Spain is ranked 14th but with a positive trend, so an improvement in the rankings is expected in the medium term. But unfortunately Fashion is not among these.

- Renewable energy

Thanks to its efforts to promote Renewable Energies and Access to and Management of Drinking Water and Sanitation, Spain obtains its best results as a country in SDG 6 (water) and SDG 7 (affordable and non-polluting energy).

- Agri-food

According to data from the Research Institute for Organic Agriculture (FIBL), in its report The World of Organic Agriculture, Spain ranks fourth in the world, and the first in the EU with the largest amount of organic agricultural land.

- Automotive and Mobility

Another of the great investment opportunities detected are Mobility solutions. According to the Sustainable Cities Index prepared by Acardis, which follows the UN sustainability criteria, two Spanish cities stand out in the top 30 ranking of Sustainable Cities: Madrid (21) and Barcelona

(28). These and other Spanish cities are looking for efficient and low-emission transport infrastructure that not only improves the well-being of its citizens but also tourism.

- Tourism and Leisure

Spain, world leader in competitiveness in Tourism for the third consecutive year (World Economic Forum), has launched a Sustainable Tourism Strategy 2030, which would allow it to maintain this leadership at a global level.

- TIC.

Digitization is an essential lever in achieving the SDGs. The ICT sector in Spain stands out for digital public services, where Spain ranks fourth in the EU according to the Desi Index 2019. COVID-19 has also highlighted Spanish startup solutions for remote work.

Related to the fashion industry to move towards sustainability, the fashion industry must take into account the environmental impact of its production

Around 5 billion garments are manufactured in the world each year. Doing all this work requires one 7,500 liters of water. These shocking figures have created alarm, inviting designers to implement some measures to combat the effect they generate on the environment. In this context, sustainable fashion was born, going from being a mere trend to an undeniable necessity.

Industry must work with a current perspective on the fashion world. In this sense, it must learn to reconsider fashion design, knowing a new supply chain that allows you to create pieces of clothing with a longer useful life. In this way, the consumerism generated by the fast fashion industry will be combated. Likewise, they will know the difference between the different textile materials, taking into account their origin.

Other instruments favouring circularity:
NEW PROCESSES
Renewable and/or recycled raw materials, reduction of polluting elements and waste in the production process.
NEW BUSINESS MODELS
Sale/purchase of pre consumption and post consumption textile products, clothes hire services, second hand, swapping and reuse.
NEW INSTRUMENTS
Eco design to promote the durability and circularity of textile products, eco labels, environmental certification, etc.

The brand philosophy of great sustainable fashion designers such as Stella McCartney must be visualized, which invites reflection in each piece, using materials such as organic cotton, recycled polyester and cashmere, raffia, among others, to achieve 100% fashion. aware of the needs of the planet.

Not only must they have theoretical knowledge of the different fabrics and new production models, but they will be able to take on the challenge of creating a completely sustainable collection that guarantees the survival of the garments throughout the seasons.

Commit to ecological materials and a processing technique that reduces the impact of the industry on the environment

Sustainable fashion seeks to be respectful of the environment, recycling old fabrics to make new garments

PILOT CASES: THE MARKET IN SPAIN AND GERMANY 2018 – JUNE 2022

For this analysis, we used the data we process through the consulting tool called TENDERBLADE. The data source is TED (Tenders Electronic Daily) the Official Journal of the EU. By European standard, all procedures of a certain type with certain amounts must be published and the procedure must be traced. We have chosen the use of this data to have more information about the target market and create our new information to work on.
First we selected the types of reference CPVs. For transparency, we insert the selection we have developed.

18000000	Clothing, footwear, luggage articles and accessories
18100000	Occupational clothing, special workwear and accessories
18110000	Occupational clothing
18113000	Industrial clothing
18114000	Coveralls
18130000	Special workwear
18132000	Flying clothing
18132100	Flight jackets
18132200	Flight suits
18140000	Workwear accessories
18141000	Work gloves
18142000	Safety visors
18143000	Protective gear
18200000	Outerwear
18210000	Coats
18211000	Capes
18212000	Cloaks
18213000	Wind jackets
18220000	Weatherproof clothing
18221000	Waterproof clothing
18221100	Waterproof capes
18221200	Anoraks
18221300	Raincoats
18222000	Corporate clothing
18222100	Suits
18222200	Ensembles

18223000	Jackets and blazers
18223100	Blazers
18223200	Jackets
18224000	Clothing made of coated or impregnated textile fabrics
18230000	Miscellaneous outerwear
18231000	Dresses
18232000	Skirts
18233000	Shorts
18234000	Trousers
18235000	Pullovers, cardigans and similar articles
18235100	Pullovers
18235200	Cardigans
18235300	Sweatshirts
18235400	Waistcoats
18300000	Garments
18310000	Underwear
18311000	Slips
18312000	Underpants
18313000	Panties
18314000	Bathrobes
18315000	Stockings
18316000	Tights
18317000	Socks
18318000	Nightwear
18318100	Nightshirts
18318200	Dressing gowns
18318300	Pyjamas
18318400	Vests
18318500	Nightdresses
18320000	Brassieres, corsets, suspenders and similar articles
18321000	Brassieres
18322000	Corsets
18323000	Suspenders
18330000	T-shirts and shirts

18331000	T-shirts
18332000	Shirts
18333000	Polo shirts
18400000	Special clothing and accessories
18410000	Special clothing
18411000	Baby clothing
18412000	Sportswear
18412100	Tracksuits
18412200	Sports shirts
18412300	Ski suits
18412800	Swimwear
18420000	Clothing accessories
18421000	Handkerchiefs
18422000	Scarves
18423000	Ties
18424000	Gloves
18424300	Disposable gloves
18424400	Mittens
18424500	Gauntlets
18425000	Belts
18425100	Bandoliers
18440000	Hats and headgear
18441000	Hats
18443000	Headgear and headgear accessories
18443100	Headbands
18443300	Headgear
18443310	Berets
18443320	Field caps
18443330	Hoods
18443340	Caps
18443400	Chin straps for headgear
18600000	Furs and articles of fur
18610000	Fur articles
18611000	Fur skins

18612000	Fur clothing
18613000	Artificial fur articles
18620000	Furs
18800000	Footwear
18810000	Footwear other than sports and protective footwear
18811000	Waterproof footwear
18812000	Footwear with rubber or plastic parts
18812100	Sandals with uppers of rubber or plastics
18812200	Rubber boots
18812300	Town footwear with rubber or plastic uppers
18812400	Flip-flops
18813000	Footwear with uppers of leather
18813100	Sandals
18813200	Slippers
18813300	Town footwear
18814000	Footwear with uppers of textile materials
18815000	Boots
18815100	Ankle boots
18815200	Calf boots
18815300	Knee boots
18815400	Waders
18816000	Galoshes
18820000	Sports footwear
18821000	Ski footwear
18821100	Cross-country ski footwear
18822000	Training shoes
18823000	Climbing boots
18824000	Football boots
18830000	Protective footwear
18831000	Footwear incorporating a protective metal toecap
18832000	Special footwear
18832100	Flying footwear
18840000	Parts of footwear
18841000	Footwear uppers

18842000	Soles
18843000	Heels
33199000	Medical clothing
35113400	Protective and safety clothing
35113410	Garments for biological or chemical protection
35113420	Nuclear and radiological protection clothing
35113430	Safety vests
35113440	Reflective vests
35113450	Protective coats or ponchos
35113460	Protective socks or hosiery
35113470	Protective shirts or pants
35113480	Protective wristbands
35113490	Protective frock
35811100	Fire-brigade uniforms
35811200	Police uniforms
35811300	Military uniforms
35812000	Combat uniforms
35812100	Camouflage jackets
35812200	Combat suits
39514500	Face cloths

Below are the results of the procedures with the level of amounts awarded. At the end of each country analysis, the list of the largest country contractors, and some presentations of the three largest contractors with the amounts awarded.

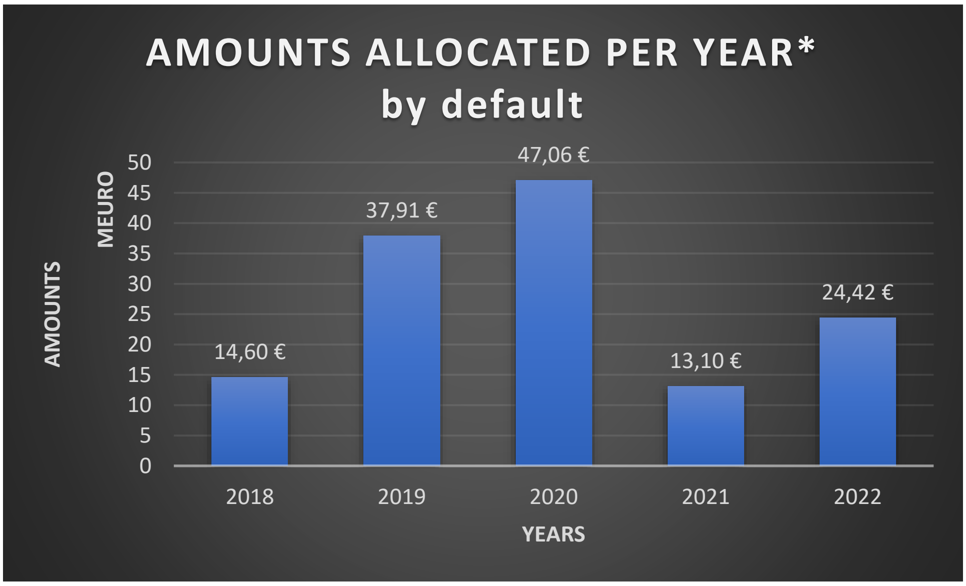
Germany Analysis

All award notices, like the rest of the documentation, are drawn up exclusively in German.
Out of 757 award notices, 92 were awarded, at least partially, by non-German entities.
Only 2 tenders are banned by European administrations (in both cases JRC, Joint Research Centre).
The main successful bidders are in the selected period:

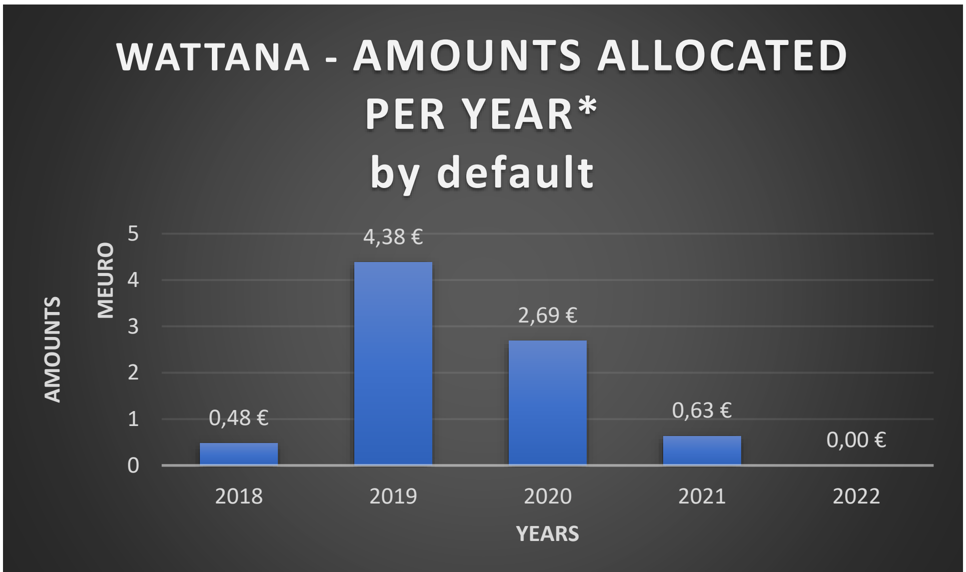
BEST BIDDERS	**NUM**
wattana gmbh	58
haix - schuhe produktions- u. vertriebs gmbh	28
ziegler textil gmbh	27
wunsch & rudolph e. k.	23
grube	22
gustav wahler	19

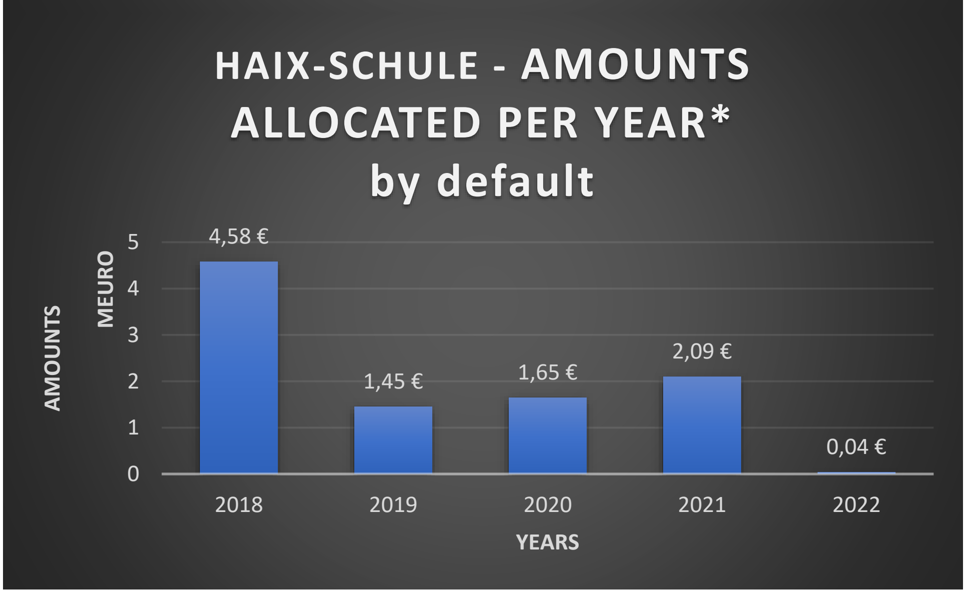
texport	17
quambusch sport + textil	16
wintex apparel gmbh	13
schuh-höhn gmbh	13
büttner gmbh	13
hexonia gmbh	13
scharrer konfektions gmbh & co. kg	11
mehler vario system gmbh	11
polas frankfurt gmbh & co. kg	11
heinrich vorndammde ohg	11
goldeck textil gmbh	11
feuchter gmbh	10
mehler law enforcement	9
lyreco deutschland gmbh	9
lhd group deutschland gmbh	9

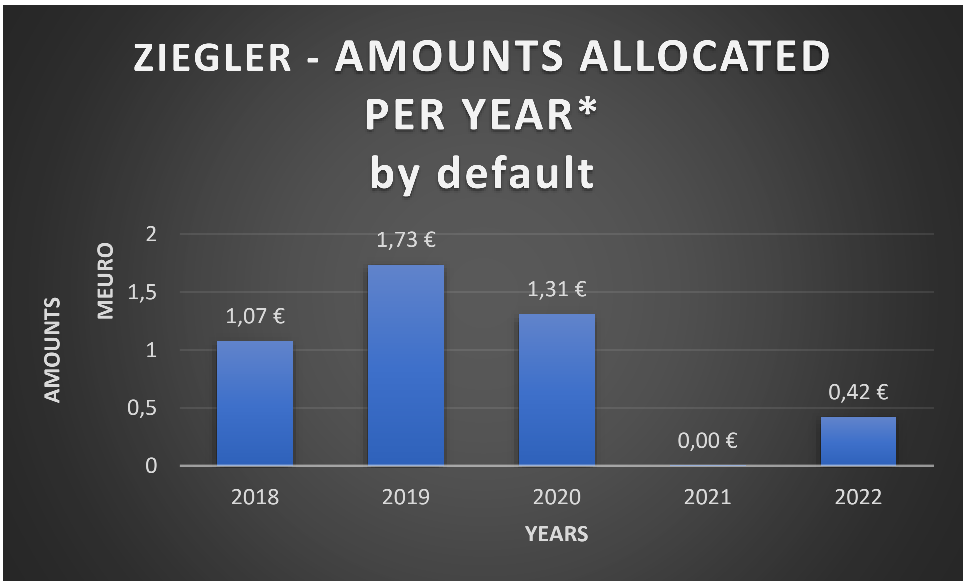
Below are the data of amounts awarded. On this, it is important to point out that in Germany framework procedures are adopted, in which the financial fees are not included in the call but a ceiling is provided. So the awards are authentic. For this reason, there are amounts that are not attractive at a financial level, but which are within a ceiling. In order to be less obscure, we use an example to make the process understood. We are in effect in a roster system with request from the successful bidder according to the needs that are highlighted.



Below are the graphs for the three biggest winners.







Wattana, who won twice as much as Haix's races, seems to earn less in some years. Strictly speaking it is not impossible, they may have won more tenders than Haix but of a smaller amount. It would be enough for a greater number of Wattana tenders to be awarded for a few cents according to what was explained earlier than those of Haix, to explain the phenomenon. The fact remains that if one looks at the graph one could deduce erroneous conclusions if he did not make the reflections that we have proposed previously.

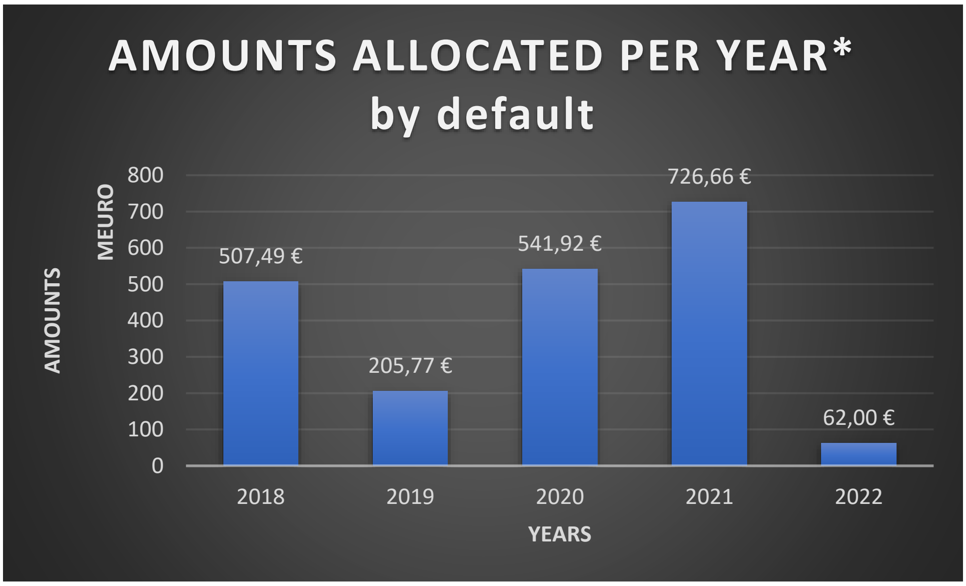
Spain Analysis

All award notices, like the rest of the documentation, shall be drawn up exclusively in Spanish.

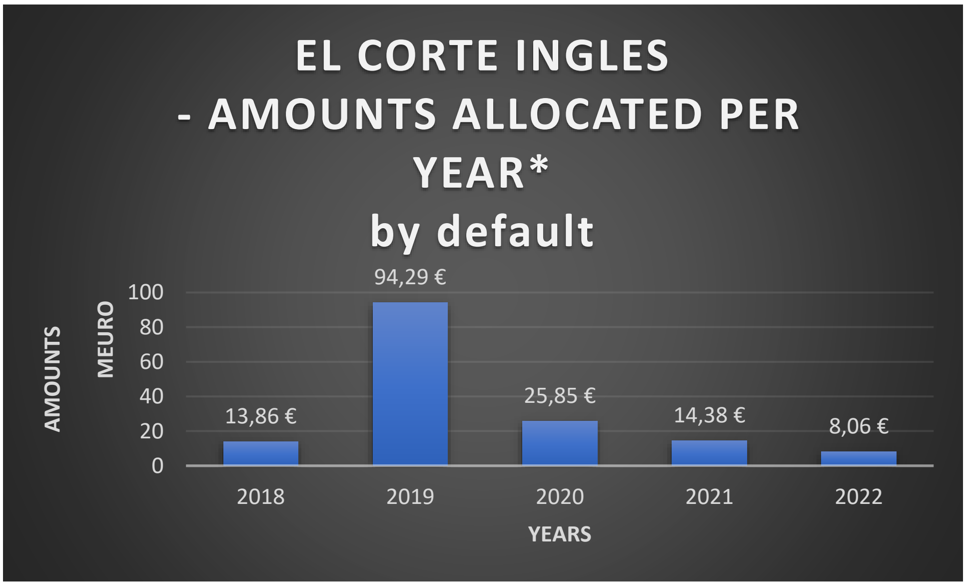
Out of 644 award notices, 12 were awarded by persons whose nationality is not mentioned and only 11 were awarded by non-Spanish entities.
The main successful bidders are in the selected period:

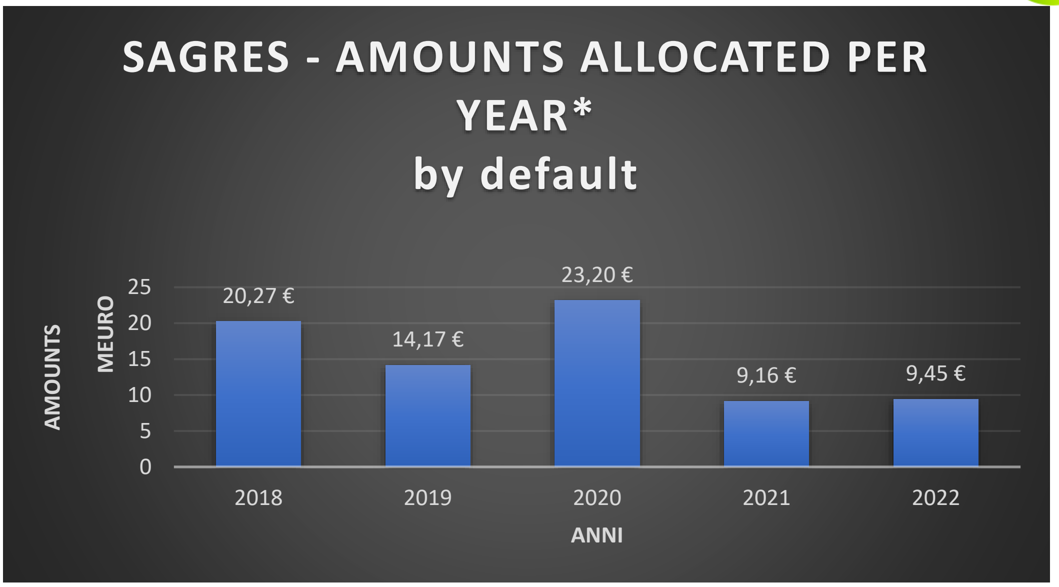
BEST BIDDERS	NUM
el corte inglés	71
iturri	64
sagres s. l.	57
guarnicioneria roal, s. a.	17
transduero	16
fabrica española de confección, s.a.	16
confecciones oroel	16
insigna uniformes, s. l.	16
medline internacional iberia s.l.u.	14
fal calzados de seguridad, s. a.	14

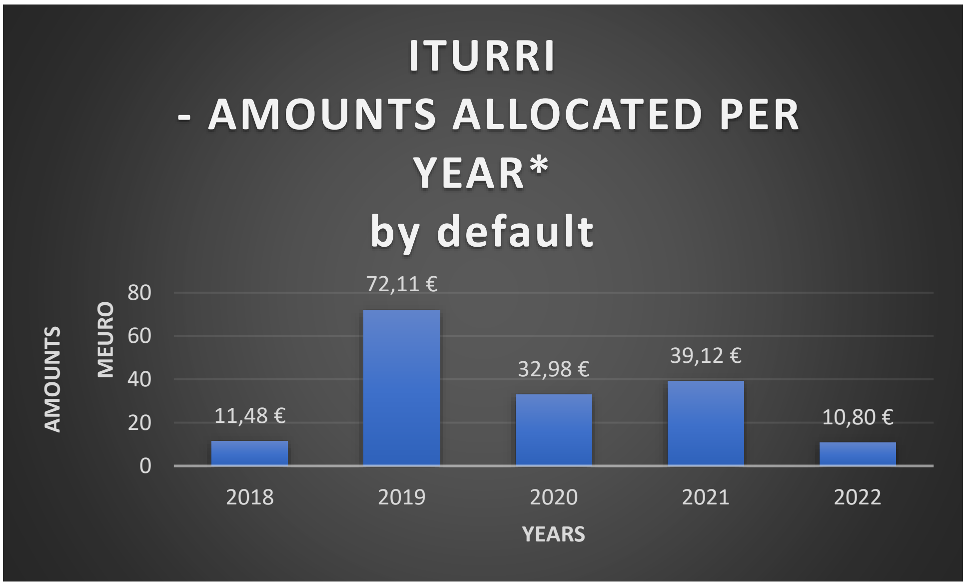
Also in this market, although with less intensity, the procedure analyzed for the German market is used. So the data is less analytical, and on this market the phenomenon has a smaller impact in the Spanish market than in the German one.



Below are the graphs for the three biggest winners.







Finally, with the support of a project partner, we include a project that we can define as good practice from the Catalonia named "THE CIRCULAR FASHION PACT, A RESPONSE PROPOSED BY CATALONIA"

This initiative is one of the circular economy pilot actions chosen by the European Union within the Interreg Europe CircE project. The Circular Fashion Pact is an open, transversal and innovative initiative to transform the textile sector. It came into being with the involvement of the Government of Catalonia and all the agents in the textile value chain, who worked together to develop its content and ensure that it can be rolled out from 2022.

The Circular Fashion Pact is an initiative that promotes a voluntary agreement to further the transition of the textile sector to a circular model, based on a comprehensive perspective that brings together all the public and private agents in the value chain. The Circular Fashion Pact is one of the measures supported by the European Union as part of the Interreg Europe CircE project (from January 2007 to June 2021). The aim of this pilot project was to further the transition to a circular economy in Catalonia (and 7 other European regions) in certain business sectors with great potential for replicating it and promoting innovation throughout Europe.

Catalonia stands out in Europe because of its great potential for making use of textile waste: we have a long history of factories that use recycled textile materials in their production processes.
The Government of Catalonia , as a partner in the CircE project, presented the Pact as a pilot scheme in 2019. From 2020 to 2021 work was carried out on designing and developing it, so that it could be implemented from 2022.
Agents of pact:
PRIVATE SECTOR
Manufacturers
•Ecoalf
•Mango
•Anged
•Cecot
•Modacc
•Moda FAD
•Moda Sostenible Barcelona
•PIMEC
Waste managers
•PreZero
•Formació i Treball
•Humana Foundation
•Griñó
•Roba Amiga/Solidança
•Gremi de Recuperacio
•Textile industry
•Antex
•AEI Textils
•Hilosa
•Triturats La Canya
•Texfor

PUBLIC SECTOR
•Government of Catalonia
•Ministry of Climate Action, Food and Rural Agenda (DACC)
•Ministry of Business and Labour (DTES)
Local government
•ACM
•AMB
•Barcelona Provincial Council
•FMC

OTHER AGENCIES
•Universities, research and technology centres
•Eurecat
•Fitex
•Intexter
•Leitat
•TecnoCampus

Environmental third sector
•Rezero

Overall objectives of the Pact for 2024*

- Reduce the generation of textile waste (kg/person/year)

- Increase the % of textile waste collected separately
- Increase the% of textile waste collected separately that is recycled