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Circular Business Opportunities in the South Mediterranean:

How Can Businesses Lead the Way to Sustainable Fashion?



Mediterranean
Action Plan
Barcelona
Convention



Regional Activity Centre
for Sustainable Consumption
and Production



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Executive Summary

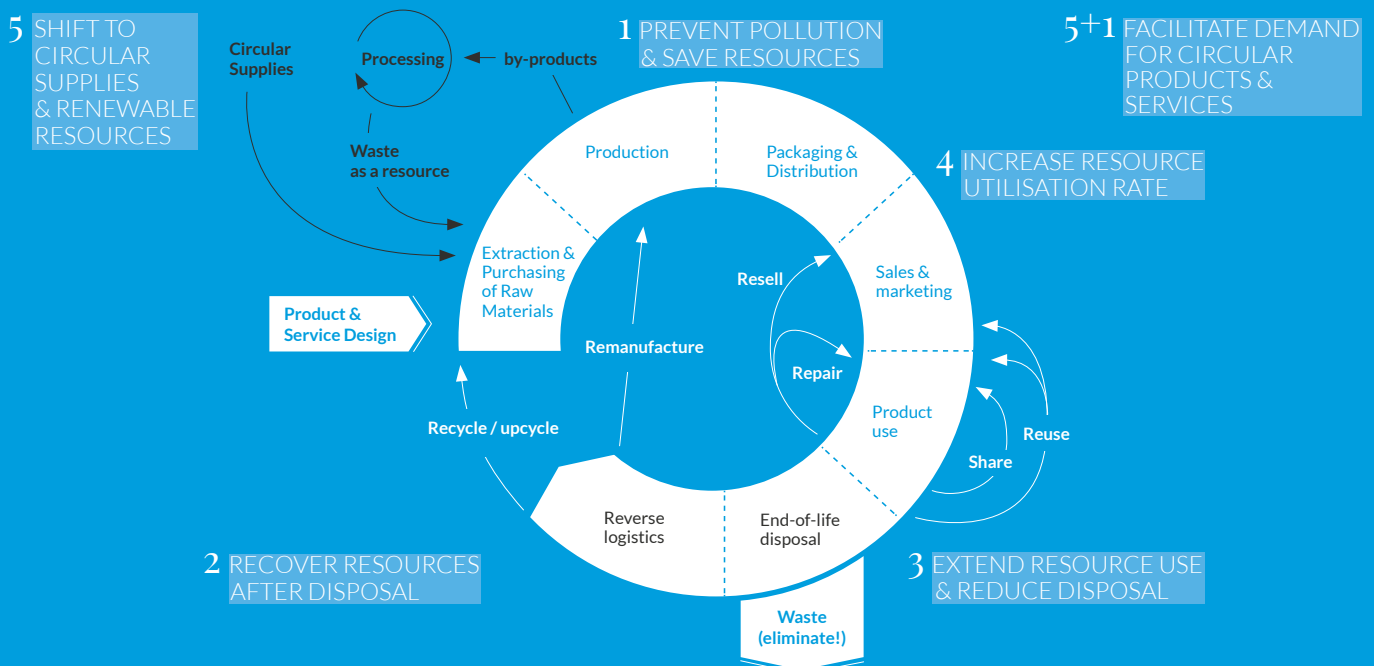
The fashion industry is one of the most important sectors in the southern Mediterranean. However, its current business model, fast fashion that “takes, makes, and wastes”, is also a source of ecological stress for the region, generating environmental hotspots like water scarcity, water and air pollution, and material waste.

This business model phenomenon is based on offering consumers a faster turnover of new styles and a high number of collections each season, often at lower prices. As a result, brands have doubled clothing production since 2000, when this phenomenon started (Niinimäki, 2020), and consumer purchase and demand has increased. South Mediterranean fashion companies have been able to successfully adapt to these demands thanks to a technical capacity that spans the length of the value chain, a skilled and low-cost workforce, geographical proximity to the European market, and institutional support from regional governments. This success, however, comes at the expense of their natural resources: in Morocco 38% of the heavy metals load in waters could be attributed to the textile and leather industry. In Turkey, it is estimated that more than 500,000 tons of textile production waste are generated each year (Altun, 2015). Virtually every garment produced is shipped in a clear plastic bag. Worldwide, the fashion industry is the second-largest industrial polluter after aviation, accounting for up to 10% of global pollution.

A map of the environmental hotspots created along the fashion value chain reveals major problem areas like the high amount of water used during natural fiber production, textile wet processing, and consumer use, as well as material waste build-up in the textile manufacturing, retail, consumer use, and end-of-life phases.

Meanwhile, the global textile industry is seeing efforts to become more sustainable. The potential for circularity in textiles was recently highlighted in the European Commission’s new Circular Economy Action Plan, which mandates extended producer responsibility in the industry and sets requirements for using secondary raw materials and managing hazardous chemicals. In the private sector, businesses have launched platforms and collaborations in order to reach circularity targets such as implementing recycling technologies and increasing the use of sustainably produced fibers. The southern Mediterranean textile industry is already feeling pressure from these recent trends, and enabling a transition to a circular economy can help the industry adapt.

This guide describes five strategies that would help achieve just that. Based on an analysis of value chains and the life cycles of products in the southern Mediterranean fashion industry, these strategies identify where value is currently being destroyed and how to retain or create value instead to close loops and enable a circular system. Each strategy details a number of business models, offered as alternatives to the current fast-fashion model of take-use-waste, and whether a given business model is specifically suitable to the southern Mediterranean region is subject to certain drivers and barriers.



Strategy number one is to prevent pollution and save resources,

primarily concerning the manufacturing stage. The business model this strategy calls for is cleaner, resource-efficient, and zero-waste production, in which production processes are redesigned to be cleaner and more efficient to reduce the amount of waste and emissions generated as well as resources used. Practical applications include sourcing cleaner inputs, reusing/recycling materials, designing products differently, using more efficient machinery and equipment, and minimizing the use of resources, such as water, energy, and chemicals.

The South Mediterranean has been operating pollution prevention and cleaner production programs for over two decades, so companies operating in the textile and fashion industries have experience that is relevant to this strategy. But there is still untapped potential, especially concerning alternative inputs and advanced technologies.

The second strategy is to recover resources after disposal.

The idea is to shift from disposing of industry waste or throwing used items “away” to reusing and recycling materials and products. Through industrial symbiosis, for example, companies work together such that the outputs of one production process (waste, by-products, and emissions) become the inputs for another (secondary raw materials and recycled emissions). The idea of waste is transformed into recovering a product and its components and recycling these back into production, through collection and recycling/upcycling systems and services. There are three business models that accomplish these strategic goals: design for disassembly, reassembly, and recycling; collection and recycling; and upcycling.

The first informs a product’s design such that the product can be more easily disassembled, reassembled, and/or recycled at the end of its life. This business model could include using materials that are recyclable; ensuring that the product will biodegrade, just in case it is not recycled; using components that can be easily separated, especially if the product contains both compostable and non-compostable materials; and opting for unblended materials (for example, 100% cotton over a cotton-polyester blend).

This is not a business model common to the South Mediterranean, where the market for recyclable garments is underdeveloped and eco-design is not yet mainstream. Some companies do produce recyclable collections, though generally for international brands; the increasing demand from these brands for recyclable garments translates to increased export potential and an opportunity for business. At the local level, garments are not currently efficiently collected and recycled at the end of their lives, in part due to insufficient infrastructure and the use of fabric blends as well as fibers that are difficult to recycle.

The second business model, collection and recycling, involves collecting “waste” and channeling it to services that can then transform the materials into a new product, whether of lesser value (downcycling) or greater (upcycling). This necessitates a network of companies that work together to collect, sort, and recycle compatibly.

In the South Mediterranean, this network is currently more of a patchwork of programs: Turkey has been successfully recycling pre-consumer textile waste for over three decades, though there is room for improvement in quality, traceability, and certification, and Morocco recently welcomed a recycling plant and spinning mill for processing recycled fibers. On the other hand, there are currently no local channels for post-consumer waste, which is exported, and in some countries even pre-consumer waste is difficult to channel.

The last business model for this strategy is upcycling, in which the yielded product is actually higher in value than what was recycled to produce it. In just one example of the potential for upcycling in the fashion industry, PET-bottle waste can be turned into synthetic fibers to produce garments and accessories.

The southern Mediterranean initiatives currently utilizing this model are rather small in scale but they could prove inspirational to other businesses considering the cost of waste disposal and the lure of turning low-cost raw materials into high-value products that consumers find interesting.

The third strategy is to extend resource use and reduce disposal during the use and maintenance phases,

though success begins at the design stage. Circular features that extend a product’s life and prolong or prevent its disposal include durability, longevity, and modularity as well as repairability, upgradability, and reusability. These design principles in the early stages of a product’s life cycle go hand in hand with maintenance/repair services and second-hand commerce in the later stages, and remanufacturing or refurbishing at the end of (one) life to restore a product’s initial functionality (for its next life). The three business models that can propel this strategy are design for durability, long lasting and modularity; repairing and upgrading; and reselling.

In the first model, a product's design ensures that it is both physically and emotionally durable, that it lasts a long time, and that it can be used flexibly in many ways and compatibly with other products. These design principles are interrelated, both with each other and with principles from other business models.

Younger people in the southern Mediterranean do not tend to seek durable, high-quality, and long-lasting products, while older generations are still in the habit of valuing these items and are more likely to repair, upgrade, and take good care of their high-quality possessions. However, modular garments that are versatile and multi-functional in particular may attract a younger crowd, and their increased concern over the sustainability of their lifestyles should also steer them towards these design principles.

Repairing and upgrading is the next business model, in which a product's original function is restored through corrective maintenance or the repair of broken parts, or an out-of-date product is given new, more desirable features. In the fashion industry, garment defects such as rips, missing buttons, or other broken parts can be mended and replaced, while unwanted clothing can be restyled or tailored into something new.

The South Mediterranean is home to a tradition of tailoring and garment repair, and long-held practices retained by older generations are being recovered as younger generations become more interested in sustainable fashion. There are big brands and retailers that don't offer these services, so there is an opportunity for them to start, or for smaller providers like experienced tailors to fill in this gap.

Strategy number four is to increase resource utilization rate, essentially by turning consumers of a product into users of a service. Instead of striving to sell the maximum number of products, companies extend product lifetime and facilitate its use by multiple users (as in the so-called sharing economy). The business model that enables this strategy is rental/leasing and subscription, in which providers maintain ownership of a product and their customers pay for the right to access that product for a period of time, with the option of keeping the product at the end in the case of leases, and on a recurring basis in the case of subscriptions.

Clothing rentals, though not subscriptions or leases, for special occasions is already relatively popular in South Mediterranean countries. A more general transition away from the idea of clothing ownership will take time, but the increasing number of innovative businesses in the region indicate that consumer behavior is expected to shift, however gradually. Both physical and online businesses have the opportunity to capture value quickly and for relatively little cost.

The final and fifth strategy is to shift to circular supplies and renewable resources. Using renewable energies and bio-based materials that can be locally and fully recycled closes loops at every life cycle stage. The first business model that powers this strategy is value chains driven by alternative, low-impact fibers or recycled materials, and the second is slow fashion in full control of the value chains.

The first aims for full recyclability and biodegradability of all materials used throughout the value chain, in which the circularity of both bio-based and inorganic materials must be considered. This business model makes use of certified and recycled/recyclable fibers and non-hazardous/bio-based dyes and finishes, among other materials, that can be fully traced through material certifications.

In the southern Mediterranean, there are several small-scale initiatives operating on this business model, but the local market for full circularity is still small. Global brands are pursuing more circular targets and should push suppliers and production facilities in this direction while local demand slowly increases with consumer awareness and government support.

Businesses adopting the second model, slow fashion in full control of the value chains, can ensure sustainability and circularity by cultivating or extracting their own input materials, or closely monitoring and continuously supporting their supply chain. Their value chain also includes the post-production phases, holding them responsible for their products past the point of sale for a holistic slow fashion approach.

This is also an uncommon model in the South Mediterranean market, in which demand for slow fashion is low, and the investment needed is relatively high. But natural raw materials can be grown in the region for international markets as well as local, and the potential for business creation, reputation, and consultancy is significant.

This guide also catalogs a number of existing companies that have implemented these circular business models with success in various places from the southern Mediterranean region to Spain, the UK, and Vietnam. There are a number of case studies provided for each business model that detail these brands' approaches and philosophies.

The southern Mediterranean region enjoys certain drivers and opportunities for implementing these business models but also faces a number of challenges and barriers. Younger generations show greater potential for adopting more sustainable forms of dressing and shopping, while consumer demand for flexibility and lower prices is rising, and both of these factors will be among the major motivators for circular businesses. An increasing interest in the resale and rental markets represent new business opportunities, the international markets for sustainable and circular products only continue to grow, and Mediterranean textile traditions lend themselves to certain business models. Modern manufacturers will have to respond to the circularity targets that international brands and retailers are pursuing.

Nevertheless, sourcing sustainable inputs/certified, which can be high or fluctuate in price and may not be consistently available, can pose a challenge for suppliers, and especially so in an immature local market with a bad fast fashion habit. Market acceptance and consumer trust and perception are certainly factors to consider when designing circular businesses in the South Mediterranean. Policy is another area of concern: government regulation as well as support in the form of incentives and financial aid is still too limited,

and collaboration among the private sector, university, and public organizations and municipalities is essential.

Considering these factors, the following circular business models can be implemented in the shorter term thanks to existing capacity and infrastructure:

- Cleaner, resource-efficient, and zero-waste production.
- Upcycling.
- Repairing and upgrading.
- Reselling.
- Rental/leasing and subscription.

The remaining business models, below, are expected to become widespread in the longer term, requiring some work in capacity building, design capabilities, technology, and the certification and traceability of value chains:

- Design for disassemble, reassembly and recycling.
- Collection and recycling.
- Design for durability, long lasting and modularity.
- Value chains driven by alternative, low-impact fibers or recycled materials.
- Slow fashion in full control of the value chains.



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1. Introduction





Clothing, footwear, and accessories made of textiles and leather are essential for everyday life, and the fashion industry is unquestionably one of the most important sectors in the Southern Mediterranean economies. This industry accounts for 50% of exports of manufactured goods to the European Union, and in many South Mediterranean countries, between 30 and 50% of all industrial jobs. On the other hand, in a region that is already under much ecological stress, the industry also exacerbates many environmental hotspots such as water scarcity and pollution, water and air emissions, and material waste. In this sense, the economic growth generated by the current “take-make-use-dispose” business model together with the phenomenon of fast fashion comes at the expense of natural resources. The question is whether alternative, modern and eco-innovative business models providing decent jobs decoupled from environmental degradation in the Mediterranean is possible. Circular economy business models might provide a solution to this challenge.

This guide aims to identify circular economy business opportunities and to capture the potential of replicating them in the context of southern Mediterranean countries. The ultimate aim is to help companies transform their existing businesses or set up new ones in the direction of circular fashion. To this end, firstly

the basic determinants, such as the current practices of production and consumption of fashion products in the region, as well as the relevant environmental hotspots are assessed based on life cycle. In addition, the impacts of international policies and other public and private initiatives are reviewed in light of the key roles that the southern Mediterranean countries play in the global value chains of the fashion industry.

With this in mind, five circular business strategies and the ten relevant business models are discussed in detail as well as the challenges and opportunities for their adoption and acceptance by businesses and consumers in South Mediterranean countries. The following strategies take into account the whole life cycle and value chain of fashion items:

- Prevent pollution and save resources.
- Recover resources after disposal.
- Extend resource use and reduce disposal.
- Increase resource utilization rate.
- Shift to circular supplies and design.

In this guide, examples of best practice are selected from a wide variety of companies of different sizes and origins, in order to crystalize the implementation of these circular strategies and the relevant business models.

The creation of this guide was a collaboration between the Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC) and the Business Council for Sustainable Development – Turkey (BCSD Turkey). It is a collective effort to foster innovative circular businesses and to create demand for sustainable products and services in southern Mediterranean countries.

This publication will be used to guide discussions with private and public organisations in the region on the challenges and business opportunities within the fashion and textile value chain. It will also be the baseline for the open innovation and capacity building activities for circular businesses that will be developed by the SCP/RAC within the framework of the European Union-funded SwitchMed initiative and will contribute to sectoral activities conducted by BCSD Turkey as part of the Turkey Circular Economy Platform.



2.

A Closer Look at Southern Mediterranean Value Chains



Production and consumption of fashion items in the South Mediterranean

The fast fashion phenomenon shapes production and consumption patterns in the South Mediterranean, just as in other parts of the world. This business model is based on offering consumers quicker turnaround of new styles and a high number of collections each season, often at lower prices. As a result, brands are now producing almost twice the number of clothing collections as they were pre-2000, when this phenomenon started, and the overall increase in clothing production demand is estimated at an annual 2% (Niinimäki, 2020).

An important hub for fast fashion production

The southern Mediterranean region plays a key role in the production of fast fashion items. Textile industries in the region are in a position to respond to quick changes in production orders, more privileged at times than their competitors in Asia¹. The industries bring together a wide and specialized network of material producers, manufacturers, and merchants that are able to respond to the different requirements and expectations of retailers. They have the experience to adapt services and products to the client demand, whether it's fast and low-cost products, high value-added manufactured items, high production volumes, or just-in-time deliveries.

One key element is that, together, several of these countries have the capacity to jointly cover the length of the industry value chain, from raw material extraction to fabric and garment manufacturing, with Egypt and Turkey being the only countries with a fully vertically integrated textile industry.

This technical capacity also comes with a skilled and low-cost workforce as well as the structural support that governments provide their fashion industry to stay competitive. In Turkey, Tunisia, Morocco, Egypt, Syria, and Jordan, the textile and clothing industry accounts for between 30 and 50% of all industrial jobs (European Commission, 2015).

Geographical proximity to markets, especially the EU, is another key asset that favors southern Mediterranean countries over other production regions. For the past two decades, the textile and clothing industry has dominated trade from Mediterranean countries to the EU, accounting for 50% of exported manufactured goods (European Commission, 2015). Turkey is the third largest exporter to the EU, and Morocco and Tunisia are amongst the top ten (Texprocil, 2018).

This proximity becomes even more relevant if we consider that the textile and clothing value chain is shifting to bring production closer to the final consumer. An increased awareness in consumers of environmental impacts along with the needs of companies are the drivers of this trend.

¹Textiles are the largest export product in Tunisia, Morocco, and Jordan, while in Egypt and Syria they are second only to oil products (European Commission, 2015).

Youths fuel demand and are open to exercising responsible consumption

The Middle Eastern and North African fashion industry grows at an annual compound rate of 6%. Increased numbers of women joining the workforce and being the youngest region in the world both fuel this growth. Young customers in particular are seeking out clothing that shows they are proud of their roots, reflecting an increase in a global awareness of their traditions and cultures (Assomull, 2019).

Since 2010, young people have played a significant role in environmental mobilizations in the Mediterranean region, signaling their growing awareness of environmental issues (Moner, 2019).

A recent study on Turkish consumers' knowledge and behavior regarding sustainability and eco-friendly fashion has put forward that consumers are well aware and supportive of eco-friendly fashion approaches, and that an increase in knowledge has a slight positive effect on attitudes and behaviors related to the eco-friendly fashion practices. The most adopted behaviors include purchasing second-hand clothing and preferring garments produced from recycled materials and labeled and packaged in environmentally friendly ways (Ceylan, 2019)².

Given globalized consumption patterns, consumption trends similar to those in Europe can be predicted. Though there used to be a strong culture of clothing repair and reuse in the southern Mediterranean countries, there will probably be a move towards high-frequency purchases and an accumulation of clothing items at home. This has especially intensified because of social media, bloggers, and influencers. In Europe, for example, more than 30% of clothing in European wardrobes have not been used for at least a year (Sajn, 2019). The average lifespan of clothes purchased in Europe is 2.2 to 5 years (EEA, 2019), half as long as it was 15 years ago.

² 86% of the consumers constituting the study sample were below the age of 35.

Environmental hotspots within fashion value chains in the South Mediterranean

Linear fashion value chains have particularly high material and water usage and contribute heavily to climate change, eutrophication, drought, and biodiversity loss. In fact, the fashion industry is the second-largest industrial polluter after aviation, accounting for up to 10% of global pollution (Niinimäki et al., 2020). The intensity of the environmental impacts mainly depends on the type of fibers used in production as well as the socio-economic contexts underlying the production, distribution, use, and end-of-life phases (JRC, 2014; EEA, 2019).

The fashion supply chain is characterized by vertical disintegration and global dispersion of successive processes, spanning a number of industries from agriculture (for natural fibers and leather) and petrochemicals (for synthetics) to manufacturing, logistics, and retail (see figure 1).

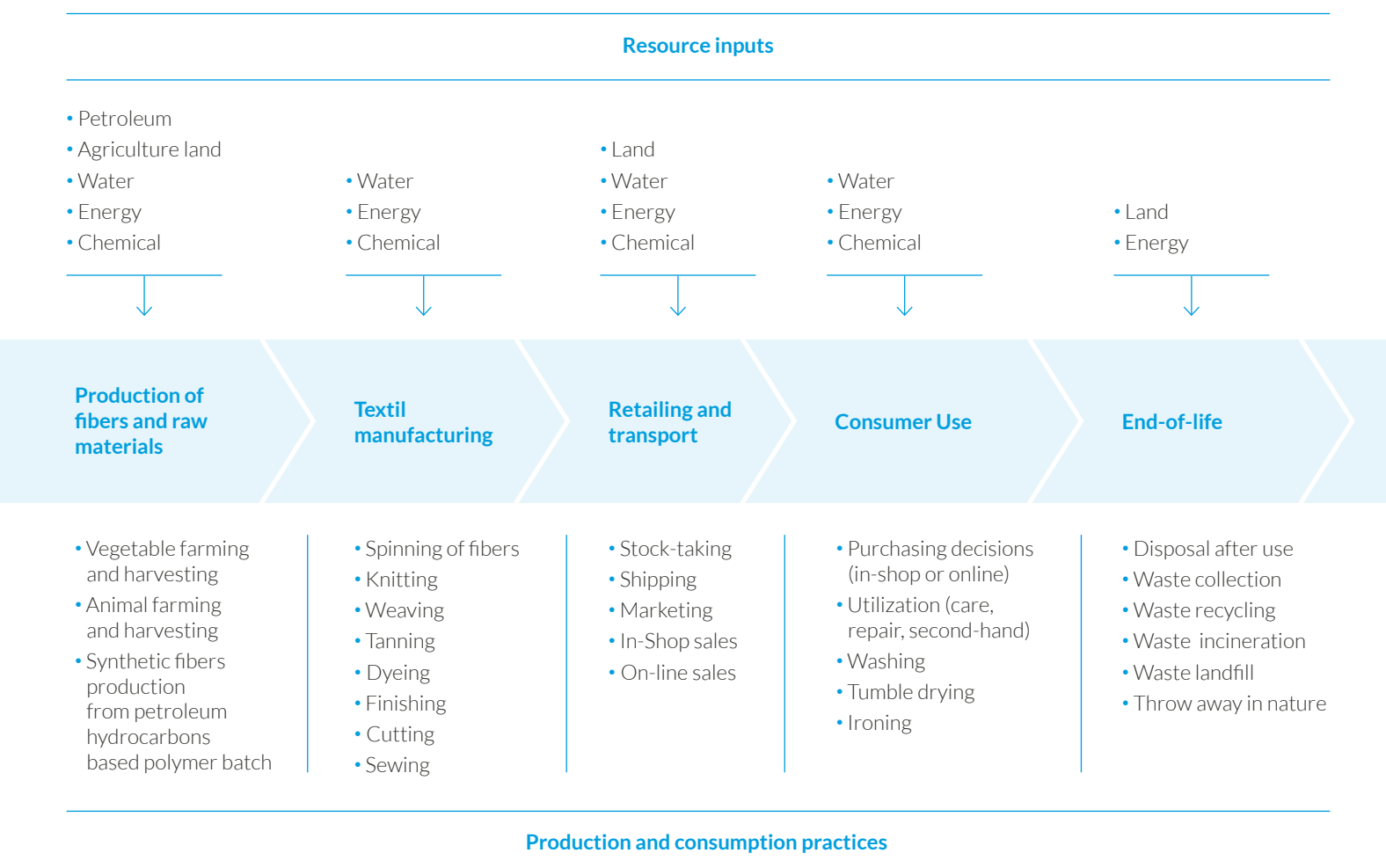


Figure 1:
Illustration of linear fashion value chains.

The following section discusses the life cycle impacts of fashion value chains in the southern Mediterranean countries, which can be divided into five phases:

- **Fiber and raw material production.** This phase can include cultivating fiber-producing crops (e.g. cotton), harvesting animal-based fibers and raw materials (e.g. wool, silk, leather), or producing synthetic fibers.
- **Textile manufacturing.** This phase involves spinning the fibers into threads, knitting and weaving, dyeing and tanning, finishing, and cutting and sewing.
- **Retail.** This phase includes shipping, stock-taking, and sales to final consumers.
- **Consumer use.** This phase takes into account purchasing and use patterns like washing, tumble drying, and ironing.
- **End-of-life.** This phase starts with disposal by the user and includes textile waste management, like sorting, recycling, incineration, and landfilling.

Fiber and Raw Material Production : **Water-intensive agriculture in a water-stressed region**

Cotton cultivation, known for its intense use of water³, pesticides, and fertilizers, is widely practiced in the water-stressed Mediterranean countries. Turkey is among the top ten cotton-producing countries, but is also in the category of “countries facing water shortage problems” with 1,519 m³ of water per capita (WWF Turkey, 2018). In contrast, the water available per capita in water-rich regions such as North America and Western Europe is around 10,000 m³ per year (Turkey Ministry of Foreign Affairs, 2020). Egypt is the premier cotton producer in Africa, well known for the exceptional length and brightness of its fibers. However, Egypt is already below the United Nations’ water poverty threshold, and the UN predicts that by 2025 it will be nearing a state of “absolute water crisis” (Guardian, 2015). Furthermore, using water for cotton cultivation competes with demands for drinking and sanitation as well as the production of other crops.

Despite the urgency, unfortunately, good water management practices have yet to be widely implemented (BCI, 2019). Egypt comes second in water consumption for cotton farming when compared to other cotton-farming countries, consuming 3,805 m³ of water per ton of cotton in

2011, when the global average for water use for cotton farming was 1,306 m³/ton (Water Footprint Network, 2013)⁴.

Moreover, excessive use of chemical fertilizers and pesticides constitute another hotspot in cotton production. In Egypt, the disproportionate use of chemical compounds threatens the quantity and quality of local water resources, exacerbating existing shallow groundwater contamination (Abdel-Dayem, 2011). In Turkey, it has been reported that 29% of pesticides are used in cotton production (Devrent et al., 2017).

Nevertheless, as natural fibers have a lower carbon footprint than synthetic fibers (see figure 2), the best way to decrease CO₂ emissions associated with fiber production would be to substitute the use of polyester with the use of natural fibers. Furthermore, plant-based fibers sequester atmospheric carbon and act as a carbon sink – for instance, one ton of dry jute absorbs 2.4 tons of carbon. Linen and hemp production have similarly low carbon emissions (Niinimäki et al., 2020).

³ Depending on various factors such as the quality of irrigation systems, the global average water footprint of one kg of cotton is slightly over 10,000 litres (Chapagain et al., 2006).

⁴ Information is based on a joint study conducted by the Water Footprint Network and the C&A Foundation with data from 2011, covering 18 cotton-supplying countries.

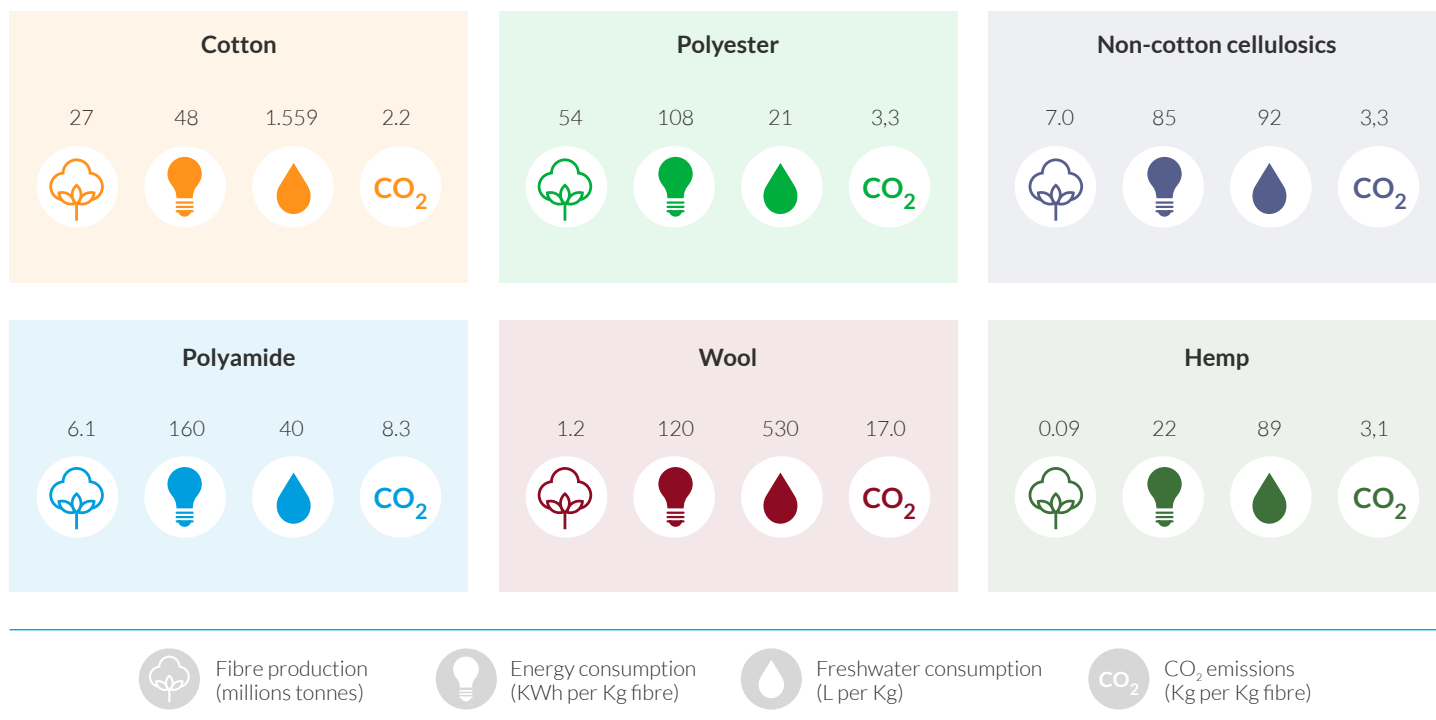


Figure 2:
The environmental impacts of six types of fibers.

To this end, the cultivation of a water-intensive fiber in a water-stressed region means that water usage continues to be the main hotspot. On the one hand, it seems that resource-efficient cotton production needs to be mainstreamed and become the new norm. On the other hand, shifting to alternative fibers that require less water to grow than cotton must be a priority for any textile manufacturers and brands that source from the region.

Turkey is among the top exporters of synthetic fibers and yarns, both polyester and acrylic, while Egypt has a certain share of acrylic staple (Nayak et al., 2013). Currently, 54% of Turkey's fiber and yarn exports consists of synthetic (man-made) fibers (Turkey Ministry of Trade, 2019). The world's largest acrylic producer is a Turkish company and has a production facility in Egypt as well.

Hemp production, which fell away over the years in Turkey, has started to pick up again through several projects and regulatory measures. Based on the Hemp Farming and Control Regulation⁵ dated 2016, hemp production is subject to permission and allowed in 19 provinces across Turkey. In 2018, hemp was harvested from an area of 54,000 m² that yielded 8 to 9 tons of fiber. Hemp seed and fiber production will increase and spread thanks to these supporting policies (Ormak, 2019). There is also a trend in the Turkish textile industry towards hemp. Kipas Tekstil, one of the leading companies in the industry, produces home textiles and upholstery products from hemp (Buz, 2020). Linen production in Turkey dropped significantly from 55 annual tons to just 2 between 2002 and 2017 due to a rapid increase in synthetic fiber use (Ormak, 2019). However, since 2018, linen production has risen again with the support of the Ministry of Agriculture and in collaboration with universities.

⁵ Kenevir Yetiştiriciliği ve Kontrolü Hakkında Yönetmelik.

Manufacturing :

Ample potential to get cleaner and become resource-efficient

Major hotspots in the production phase, both for textiles and leather, include water usage and hazardous chemicals⁶. Dyeing and treatment in textiles and chrome tanning processes in leather account for the highest impacts. In Turkey, 65% of the chemicals used in the textile industry are associated with wet processing, also responsible for 85% of the industry's water consumption. A study of the Turkish textile industry has shown that between 20 and 230 tons of water are used to produce just 1 ton of textile fabric (WWF Turkey, 2018). The discharging of polluted wastewater is similarly of concern. For example, in Morocco, a 2002 study found that the textile and leather industry was responsible for 38% of the heavy metals load in waters, which measured 257 annual tons (United Nations, 2014).

Another high-impact aspect of the manufacturing phase is energy use. Energy use in raw material production and in textile finishing are the main contributors to climate change. Among fiber types, the largest contributor to climate change in the production phase is acrylic, followed by nylon and polyester, while silk has the least impact (JRC, 2014). Due to the high energy consumption, the production of raw materials generates significant greenhouse gas emissions as well. According to the JRC (2014), 51% of the total impact that textiles have on climate change occurs in the production phase, with 44% occurring in the use phase and 5% owing to transport. As an industry the textile sector also does a significant share of climate damage. For example, in Turkey, textile production constitutes 19% of the total industrial energy expenditure, and of that expenditure, wet processes account for 80% (WWF Turkey, 2018).

Production waste is another important environmental hotspot because it places pressure on landfills, eventually contributing to global warming. In the cloth manufacturing sector, an estimated 20% of pre-consumer textile input currently ends up as waste (EREK, 2020). For example, it is estimated that Turkey generates more than 500,000 tons of textile production waste each year (Altun, 2015). In the southern Mediterranean countries, there is ample potential to tackle the main hotspots within the manufacturing phase by shifting to cleaner and more resource-efficient textile and leather production, as recently demonstrated by the EU-funded SwitchMed MED TEST (Transfer of Environmentally Sound Technology) II project that was implemented by the UNIDO⁷. In Turkey, the Ministry of Industry and Technology carried out a project to identify the industry's resource efficiency potential. In this context, current practices and resource efficiency potentials for textile industry were also determined⁸.

⁶ Textile production processes use a large amount and wide variety of chemicals. The production of 1 kg of cotton t-shirts, for example, requires about 3 kg of chemicals (KEMI, 2014).

⁷ Based on the average resource savings achieved in the MED TEST II project for energy, water, and CO₂, the overall industrial manufacturing sector in the Southern Mediterranean region could save 76,667 GWh of energy (equivalent to the annual residential energy consumption of more than 50 million people), 700 million m³ of water (equivalent to the annual water consumption of 11 million people), and 18 million tons of CO₂ (UNIDO, 2018).

⁸ Reduction potential was identified based on current usage levels and applicable techniques and technologies: Water consumption by 15 to 79%, energy consumption by 15 to 40%, chemical consumption by 40 to 60%, waste generation by 54%, and wastewater generation by 23 to 72% (Turkey Ministry of Industry and Technology, 2017).

Retail :

Challenges posed by polybags and mass dumping of unsold items

The transport and retail phase is characterized by pre-consumer waste from packaging, tags, hangers, and bags, as well as by the large proportion of products that never reach consumers, as the unsold leftovers are thrown away (Sajn, 2019). The traditional model for textile and leather goods works with up-front buying, based on seasonal forecasting and planning. Forecasting error can be as high as 40%, a number explained by factors like the unpredictability of customer wishes, lack of available relevant data, and massive lead times between an order and the goods' arrival in the store (for example, traditional fashion businesses have a lead time of about 36 weeks). Overproduced goods are usually discarded, often to landfills, which eventually contributes to global warming (Possible Future, 2018).

The obvious hotspot that demands retailers' attention is the clear plastic bag (polybag), which covers almost every garment on its journey from manufacturing to retail stores or consumer homes. Despite being a relatively insignificant part of the overall value chain, the use of polybags is a relevant aspect to tackle, firstly due to the global warming impact of producing plastics from fossil fuels, and secondly, due to the impact of discarded plastics on the marine environment (Holding and Gendell, 2019). If virtually every garment is shipped in a polybag, there could be more than 150 billion polybags produced per year. It is difficult with current data to say the precise end-of-use pathway for garment polybags, but looking at the general data for packaging gives an indication. In Europe, for example, the majority of plastic packaging waste is sent to landfills or incinerated (energy recovery), with recycling rates of around 41% (Fashion for Good, 2019).

Usage :

Increasing pressure on water resources due to maintenance of fashion items

The consumer-use phase has a significant environmental footprint due to the water, energy, and chemicals (primarily detergents) used in washing, tumble drying, and ironing (JRC, 2014).

In recent years, plastic microfibers from the washing of plastic-based textiles, such as polyester, nylon, and acrylic, have been identified as another major environmental issue. Each year, an estimated half a million tons of plastic microfibers—equivalent to more than 50 billion plastic bottles—resulting from the washing of textiles are released into the ocean (EMF, 2017).

An important issue to mention in this phase is the strikingly low rates of clothing utilization that lead to an increased environmental footprint. It is estimated that more than half of fast fashion items are disposed of in under a year (EMF, 2017). Extending the lifetime of a fashion item only by 10%, i.e. 3 months, could lead to major environmental footprint reductions: 3 million fewer tons of CO₂ emitted, 600 million fewer m³ of water used, and 150,000 fewer tons of waste generated (WRAP, 2013).

In the Mediterranean region, high rates of water use in water-scarce areas and wastewater discharges containing toxic chemicals and microplastics threatening the cleanliness of the Mediterranean Sea continue to be the main priorities. At the same time, as in any other part of the world, fast fashion trends fuel overconsumption, leading to high rates of waste generation, which is the subject of the end-of-life phase.

End-of-life :

Fast fashion means fast disposal at a large scale

Most post-consumer fashion items are be thrown away and burned in incinerators, or end up in landfills where they release methane, contributing to global warming (Sajn, 2019). It is estimated that approximately 600,000 tons of post-consumer textile waste is generated in Turkey, and there is currently no system for the recovery of post-consumer waste (Altun, 2015). In Morocco, 2% of domestic solid waste has been identified as textile waste, amounting to approximately 100,000 tons per year (Bensaid, 2010). In Jordan, fabric waste accounts for 4.3% of municipal solid wastes (Aljaradin, 2010).

In the absence of separate collection systems, and given the technical challenges of fiber separation and fiber quality in recycling (EEA, 2019), it seems that Mediterranean countries will be placing more and more pressure on municipal landfills and contributing even further to climate change.

Map of environmental hotspots

Mapping environmental hotspots in fashion value chains in the southern Mediterranean countries shows that the major aspects to tackle are 'water use' during the natural fiber production, textile wet processing, and consumer use phases as well as 'material waste' build-up during the textile manufacturing, retailing, consumer use, and end-of-life (see figure 3).

	Productions of fibres and raw materials	Textile manufacturing	Retailing and transport	Consumer use	End-of-life	
Input	Land use	Primary				
	Water use	Primary	Primary	Primary		
	Energy use	Secondary	Secondary	Secondary	Secondary	
	Chemicals use	Secondary	Primary		Tertiary	
Output	Emissions to air	Tertiary	Tertiary	Tertiary	Secondary	Primary
	Emissions to water	Tertiary	Primary		Primary	
	Material waste		Secondary	Primary	Primary	Primary
	Biodiversity loss					
	Toxic substances	Secondary	Secondary			

Figure 3: Map of environmental hotspots in fashion value chains in the South Mediterranean.

To that end, production needs to shift to less resource-intensive fibers. Moving away from the cultivation of natural fibers that require heavy land and water use is recommendable. Synthetics (polyester and polyamide) may not be the answer either, due to high energy consumption. In parallel, manufacturing centers in the South Mediterranean need to explore technologies that require less water and less fossil fuel-based energy.

In the use phase, on the one hand, the Mediterranean consumers have to wake up to the serious environmental impact of using and cleaning clothing and household textiles—washing, drying, and ironing. On the other hand, and most significantly, large volumes of textiles need to be diverted from landfills, and "simply throwing stuff away" must cease to be the norm.

The coming sections discuss potential policy measures and sustainable business models to effectively tackle the environmental hotspots within fashion value chains.

Circularity Efforts at International and European Levels

The concept of a circular economy has gained a lot of attention from both government and consumer sides, and businesses are moving towards applying circular solutions to meet requests and develop relationships with customers. The adoption of circular principles by leading brands through various initiatives and programs has affected production in the fashion industry and accordingly, across all parts of the value chain, including suppliers and producers in the South Mediterranean countries.

Initiatives Driven by Public Policy

The European Commission has stepped up in recent years to foster Europe's transition to a circular economy, through the Circular Economy Action Plan. The first such plan was launched in 2015, and as part of the [European Green Deal](#) (Europe's roadmap for sustainable growth), the [new Circular Economy Action Plan](#) was announced in March 2020. Due to its significant potential, the textile industry has been identified as one of the key value chains and priority product categories by the European Commission. The plan aims to boost the EU market for sustainable and circular textiles and a transition to more circular business models.

Considering the complex value chain of textiles, and the fact that 60% by value of clothing in the EU is produced elsewhere, it is expected that such EU policies will have an effect on other countries as well, especially those exporting and supplying to the EU. Existing and upcoming EU policies are summarized in the table below.

Table 1:
Existing and upcoming EU policies enabling circular economy business models within the textile value chain.

Policy instruments Life cycle stage	Extraction of natural resources and sourcing of materials	Manufacturing and packaging	Acquisition & use	End-of-life
<p>Regulatory Instruments</p>	<ul style="list-style-type: none"> • The Textile Regulation (EU) No 1007/2011 on fiber names and related labelling and marking of the fiber composition of textile products. This contributes to a common categorisation of textile materials, which will help in the transition to the circular economy • The Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation (EC) No 1907/2006 sets standards for chemical substances incorporated in textiles • The Biocides Regulation (EU) No 528/2012 establishes the regulatory framework for the use of biocidal products 	<ul style="list-style-type: none"> • The EU flagship initiative on the garment sector (European Parliament resolution of 27 April 2017) calls on Member States and textile manufacturers to increase funding for research and development, including in the field of clothes recycling. It also called for the Commission to propose binding legislation on due diligence obligations for supply chains in the garment sector and stressed the right of consumers to be informed on the sustainability, compliance with human rights, and environmental credentials of garment industry products • Based on the new Circular Economy Action Plan, the EU Eco-design Directive (2009/125/EC) will be expanded to include textiles and circularity principles. Requirements for uptake of secondary raw materials and management of hazardous chemicals will be set 	<ul style="list-style-type: none"> • Based on the new Circular Economy Action Plan, requirements will be set for providing consumers with repair and reuse services 	<ul style="list-style-type: none"> • The Waste Framework Directive (EU) 2018/851 (amending Directive 2008/98/EC) specifically refers to textiles. The directive calls for end-of-waste specific criteria for textiles to be developed and for the introduction of the separate collection of textile wastey • Currently France is the only EU Member State to have an extended producer responsibility (EPR) law for clothes, in place since 2006. Elsewhere, companies such as H&M run voluntary collection schemes. Based on the new Circular Economy Action Plan, the implementation of EPR will be mandatory for textiles • The Waste Framework Directive (2008/98/EC) requires that the Member States set up separate waste collection for textiles by 2025 • Based on the new Circular Economy Action Plan, the EU Eco-design Directive (2009/125/EC) will be expanded to include textiles and circularity principles. Requirements for uptake of secondary raw materials and management of hazardous chemicals will be set

Economic Instruments

- A call offering funding for R&D and innovation on **“Innovative textiles – reinventing fashion”** is part of the Horizon 2020 (H2020) work programme
 - The Smart Specialization Platform has **“Smart Regional Investments in –Textile Innovation”** as a thematic area. The RegioTex initiative aims to invest in new technologies that would respond to key economic, social, and environmental issues
 - Based on the new Circular Economy Action Plan, incentives and support for product-as-a-service models, circular materials, and production processes will be provided
- EU funding for multinational research projects through H2020
Examples:
- **RESYNTEX** is an H2020 research project which aims to produce secondary raw materials from unwearable textile waste
 - **Trash2Cash** was an EU-funded H2020 research project which aimed to create new regenerated fibers from pre-consumer and post-consumer waste. It was also pioneering a whole new way of developing materials

- The EU's [Green Public Procurement guidelines on Textile Products and Services](#). The final criteria can be found in the [GPP Technical report](#)
- The report "[Environmental impact of textile and clothes industry](#)" states that the product use phase is the most polluting. The report provides recommendations for target consumers
- The report "[IMPRO-Textiles](#)" analyses the factors that change consumer behaviour. An example of good practice is the "[I prefer 30°](#)" campaign
- The EU's LIFE Programme funds initiatives such as [AskREACH](#), an app that provides consumers with information regarding the presence of potentially hazardous chemicals in the textile supply chain

Voluntary or Procedural Instruments

- The EMAS [Sectoral Reference Document](#) on Best Environmental Management Practice in the Retail Trade sector (2015) and the [Best practice report](#) (2013) include mentions to the textile sector
- Different voluntary environmental labelling schemes exist in the market. They include the [ISO 14024 "Type I" EU Eco-label](#) (valid as of 5 December 2020), the Nordic Swan, and the Blue Angel. Other standards such as the Global Organic Textile Standard ([GOTS](#)) address environmental and social criteria along the supply chain. The German Ministry of Development has very recently released the [Green Button](#) label that functions as a governmental watchdog according to 26 social and environmental criteria within textile value chains
- The [EU Ecolabel](#) is a voluntary scheme that evaluates the life cycle of the product, allowing consumers to easily identify environmentally friendly and high-quality products. Some of the Ecolabel's criteria include the restriction of hazardous substances and durability. With the currently developing sustainable product policy framework, circularity will be more embedded into the Ecolabel context
- There is a strong push within the industry to make every phase of production more sustainable, with big companies leading investment in new technologies and business models

Initiatives Driven by the Private Sector

Business support organizations and sustainable solutions providers are making efforts to support a circular economy transition through business-driven programs. Key industry players are investing and participating in these programs

to take initiative at different levels and make production and consumption systems more circular and sustainable (Table 2).

Table 2:
Circular Economy Initiatives of Different Organizations.

Organization	Description	Program / Initiative	Program Partners /Core Partners	Program Description
The Ellen MacArthur Foundation	<ul style="list-style-type: none"> The Ellen MacArthur Foundation is a UK-registered nonprofit organization which works with businesses, the government, and academia to build a framework for every field of the circular economy 	Circular Fibers Initiative	<ul style="list-style-type: none"> Burberry, Inditex, Stella McCartney, HSBC, H&M Group, PVH, Gap Inc. 	<ul style="list-style-type: none"> The initiative drives collaboration between industry leaders and other key stakeholders to create a circular textiles economy. Its ambition is to ensure that clothes are made from safe and renewable materials, that new business models increase their use, and that old clothes are turned into new. It promotes a new system based on circular economy principles
		Make Fashion Circular	<ul style="list-style-type: none"> Burberry, Gap Inc., H&M Group, HSBC, PVH, Stella McCartney 	<ul style="list-style-type: none"> Make Fashion Circular, the second phase of the Circular Fibers Initiative, redesigns the fashion industry's operating model to keep safe materials in use. It aims to stimulate the level of collaboration and innovation necessary to create a new textiles economy
		The Jeans Redesign		<ul style="list-style-type: none"> The Jeans Redesign guidelines, created by the Make Fashion Circular initiative, includes minimum requirements for jeans on durability, material health, recyclability, and traceability
Circle Economy	<ul style="list-style-type: none"> Circle Economy (CE) is a not-for-profit impact organization. CE generates knowledge and provides access to information on circular economy topics. It also supports companies with their expertise and delivers projects that contribute to the acceleration of circularity 	Circle Textiles Programme	<ul style="list-style-type: none"> C&A Foundation, Gap, Oxfam, Amsterdam Fashion Institute, VF Corporation, Fashion for Good 	<ul style="list-style-type: none"> The Circle Textiles Programme (CTP) was launched in 2014 as the first sector program from Circle Economy. The CTP has completed many projects focusing on textile-to-textile recycling, circular business models, design for cyclability, technology assessments, and circular infrastructure developments. The program aims to connect a circular supply chain of producers (manufacturers, retailers, and brands) and solutions providers (collectors, sorters, recyclers, remanufacturers, logistics, laundry, etc.), in order to reduce textile waste by increasing apparel brands' capacity to assess and adopt circular strategies

		<p>The Alliance for Responsible Denim</p>	<ul style="list-style-type: none"> Amsterdam University, Made-By 	<ul style="list-style-type: none"> The Alliance for Responsible Denim brings denim brands together to collectively take steps towards improving the ecological sustainability impact of denim production. It includes establishing measurements, benchmarks, and standards for resource use (e.g. chemicals, water, energy) and recycled denim
<p>Global Fashion Agenda</p>	<ul style="list-style-type: none"> Global Fashion Agenda is the Denmark-based global leadership forum and a community platform for industry collaboration on fashion sustainability 	<p>Copenhagen Fashion Summit</p>	<ul style="list-style-type: none"> ASOS, Bestseller, H&M Group, Kering, Li&Fung, Nike, PVH Corp., Sustainable Apparel Coalition, Target 	<ul style="list-style-type: none"> This event mobilizes and engages the fashion industry by creating joint commitments uniting industry leaders to share their knowledge. It also raises awareness of a circular economy amongst fashion leaders and executives
		<p>2020 Circular Fashion System Commitment</p>		<ul style="list-style-type: none"> In 2017, Global Fashion Agenda launched the first Commitment—the 2020 Circular Fashion System Commitment—to accelerate the pace of the industry’s sustainability transition. Since its launch, the Commitment has been signed by 90 companies, representing 12.5% of the global fashion market (calculated by revenue/turnover), that have committed to making improvements in areas of circular fashion: design, collection, reuse, and recycling
<p>The Sustainable Apparel Coalition</p>	<ul style="list-style-type: none"> The Sustainable Apparel Coalition is the apparel, footwear, and textile industries’ leading alliance for sustainable production 	<p>The Higg Index</p>	<ul style="list-style-type: none"> The Sustainable Trade Initiative (IDH) 	<ul style="list-style-type: none"> A relevant business-led initiative is the Higg Index, developed by the Sustainable Apparel Coalition. It is an indicator-based tool for apparel that enables brands, retailers, and facilities to evaluate material types, products, facilities, and processes
<p>Fashion for Good</p>	<ul style="list-style-type: none"> Fashion for Good is a global initiative. Its mission is to bring together the entire fashion ecosystem through their Innovation Platform and as a convener for change. They offer their Innovation Platform, implement a startup acceleration program, and create a global network for sustainable fashion 	<p>Three key programs: Accelerator, the Scaling Program and the Good Fashion Fund</p>	<ul style="list-style-type: none"> Corporate partners: adidas, Bestseller, C&A, Channel, Groupe Lafayette, Laudes Foundtion, Kering, Otto Group, PVH, Stella McCartney, Zalando 	<ul style="list-style-type: none"> Fashion for Good provides support to innovators based on their business maturity through their programs by focusing on scaling technologies and circular business models

Impacts and Reflections in the South Mediterranean

International brands continue to set ambitious targets for sustainability and circularity. A consistently developing policy framework in addition to the relevant international initiatives and coalitions accelerate the spread of circularity efforts to value chains all over the globe. South Mediterranean countries which have a significant share in the

global value chains of fashion products are directly affected by these developments. Table 3 includes examples of the circularity targets of some global brands and the South Mediterranean countries that may be affected, since the mentioned brands have suppliers and production facilities in those countries.

Table 3:
Circularity targets of global brands and countries affected (Cochrane, 2019; Wright, 2019; Global Fashion Agenda, 2019).

Company/Brand	Target	Year	Relevant Countries (production/supply)
Inditex	100% of their designers will be trained in circular design principles.	2020	Morocco, Turkey
	A 3.5-million-USD investment will be made in textile recycling technologies for post-consumer waste.	2020	
	100% of the cotton, linen, and polyester used will be organic, sustainable, or recycled.	2023	
	100% of the cotton, linen, and polyester used will be organic, sustainable, or recycled.	2025	
Hugo Boss	Training in circularity will be provided for everyone involved in the value chain.	2020	Egypt, Turkey
	50% of the cotton used will be sustainable.	2020	
	80% of the cotton used will be sustainable.	2025	
Gap	Recycling technologies for post-consumer materials will be scaled up in the supply chain.	2020	Egypt, Tunisia, Jordan
	100% of the cotton used will be sustainable.	2021	
H&M	100% of the cotton used will be sustainable.	2020	Tunisia, Morocco, Turkey
	100% of all materials used will be sustainably sourced or recycled in all products.	2030	
Hugo Boss, Gap, PVH, Levi's	Zero Discharge of Hazardous Chemicals (ZDHC).	2020	Egypt, Tunisia, Morocco, Turkey

These targets obviously place significant pressure on the entire supply chain. This greatly affects South Mediterranean countries, mainly Morocco, Egypt, and Turkey, where most production for big brands takes place. The targets provide valuable opportunities as well. The recycling investments planned by the brands in particular should be regarded as

opportunities for current and potential suppliers, including current and potential recyclers in the region. In line with all these developments, a good number of initiatives have been taken by, or with the collaboration of, brands and national/international organizations. Some examples are summarized below in Table 4.

Table 4:
Initiatives and programs for South Mediterranean countries (Cochrane, 2019; UNIDO, 2019-a; Filmar Network, 2020; Fiber2Fashion, 2018; Netherlands Enterprise Agency, 2019).

Program/ Initiative	Leader and Partners	Description
The Egyptian Cotton Project	<ul style="list-style-type: none"> United Nations Industry Development Organization (UNIDO), the Egyptian cotton industry, international brands such as Hugo Boss, John Lewis. 	<ul style="list-style-type: none"> UNIDO aims to help the Egyptian cotton industry develop and become more sustainable through BCI certification. This initiative aims to develop a traceable and transparent supply chain that could reach into Africa, in collaboration with brands.
Re-jeanaration Project (Egypt)	<ul style="list-style-type: none"> UNIDO, Egyptian and Italian companies and designers. 	<ul style="list-style-type: none"> The project aims to recycle denim yarn from pre-consumer waste in Egypt; test quality and market opportunities for the obtained material; share knowledge, expertise, and technology to advance experiences in high value recycling; and reduce pressure on virgin resources while adding value to waste and making recycling profitable.
Incentive program (Morocco)	<ul style="list-style-type: none"> Moroccan Trade and Investment Agency (AMDIE). 	<ul style="list-style-type: none"> The Moroccan government started to provide incentives in 2019 for companies to get sustainably certified to satisfy the 2025 sustainability targets set by Inditex.
Circular Textile Cluster (Morocco)	<ul style="list-style-type: none"> Hallotex, Textil Santanderina, Vich Industrial, Lenzing Group. 	<ul style="list-style-type: none"> The project involves the construction of a spinning mill that processes recycled fibers and a recycling plant in Tangier, Morocco, that is expected to recycle over 1 million kilograms of textile waste per year. The entire production chain is worked sustainably through to the recycling of textile waste, according to a media statement.
Netherlands-Turkey cooperation on a circular economy	<ul style="list-style-type: none"> Dutch consulate in Turkey, BCSD Turkey, CIRCO. 	<ul style="list-style-type: none"> Since the Netherlands is one of the biggest markets for Turkey in the EU, and Dutch textile/fashion businesses have committed to sustainability, a collaboration on a circular economy started in 2019. In this context, Circular Design workshops and trainings were organized in which textile/fashion companies participated. It is also aimed to promote the cooperation between Dutch and Turkish businesses for circular textiles, through the Partners for International Business Program.
Turkey Circular Economy Platform (evolved from Turkey Materials Marketplace)	<ul style="list-style-type: none"> BCSD Turkey, EBRD, national and international funders. 	<ul style="list-style-type: none"> The Turkey Circular Economy Platform provides knowledge, technical assistance, material exchange, and collaboration platforms for all stakeholders, for promoting a circular economy in Turkey. Textiles has been identified as one of the priority industries for the platform. Accordingly, sectoral meetings are organized, guides are prepared, industrial symbiosis is promoted, and technical assistance funding is provided for the Turkish textile industry's transition to a circular economy.



3.

**Circular
Economy
Approach
and Business
Opportunities
for the Fashion
Industry**





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As previously discussed, the fashion industry is currently based on the linear economic system of take-use-waste. Globally, only 1% of fiber input is recycled back into garment production. It is clear that there is much potential for circularity in this industry.

This potential lies in the value destruction points along a value chain. The aim of a circular economy is to minimize value destruction and encourage value retention or creation across the value chain. Retention of resource value means conserving resources in as close as possible to their original state (Reike et al., 2018). Looking at the whole life cycle and the value chain, significant value destruction is evident in both production and post-production phases, including use and post-consumer processes as well.

Globally, of all fiber input used for clothing, 12% is lost during production. In addition, water, energy, and chemical consumption is very intensive both at the raw

material extraction and the manufacturing stage. In-house pollution prevention and cleaner production measures as well as industrial symbiosis practices help improve the resource efficiency and circularity of the whole value chain. In the implementation of such measures, the industry has mainly focused on production phases while paying little attention to the consumer and post-consumer-related phases.

A circular economy focuses particularly on these phases and looks at the whole value chain. A fashion product that becomes waste and is sent to a landfill or incinerator represents significant value destruction, and customers buying more garments and accessories than they will actually use, and underutilizing them for various reasons, exacerbate that value destruction. A circular economy suggests that product value should be maintained over a longer time and additional value should be created.

A circular economy would mean changing the whole system and would affect all actors in a value chain. In this system, manufacturers take into consideration the entire life cycle and value chain from the very beginning and design and manufacture accordingly. Consumers try to extend the product's life span in various ways. Manufacturers, retailers, or other stakeholders like public organizations and NGOs facilitate consumer efforts by establishing the necessary infrastructure.

Services and service providers are also key for this system. A circular economy proposes a service-based approach rather than a product-based approach. New business opportunities are available for those who can provide solutions to value destruction within a chain and develop appropriate services.

Circular Economy Strategies and Business Models



Based on value chain analysis and life cycle impacts, five main business strategies have been identified as ways to accelerate the fashion industry's transition to a circular system (Figure 4):

- 1) Prevent pollution & save resources
- 2) Recover resources after disposal
- 3) Extend resource use & reduce disposal
- 4) Increase resource utilization rate
- 5) Shift to circular supplies and renewable resource

The strategies are numbered one through five in order of resource value retention as well as difficulty of implementation and coordination within value chains, with five being the greatest retention value and effort required for implementation and coordination, and one being the lowest.

In the following sections, the aforementioned strategies and their relevant circular business models will be examined in detail and assessed from the perspective of applicability in the South Mediterranean.

Circular Economy Strategies

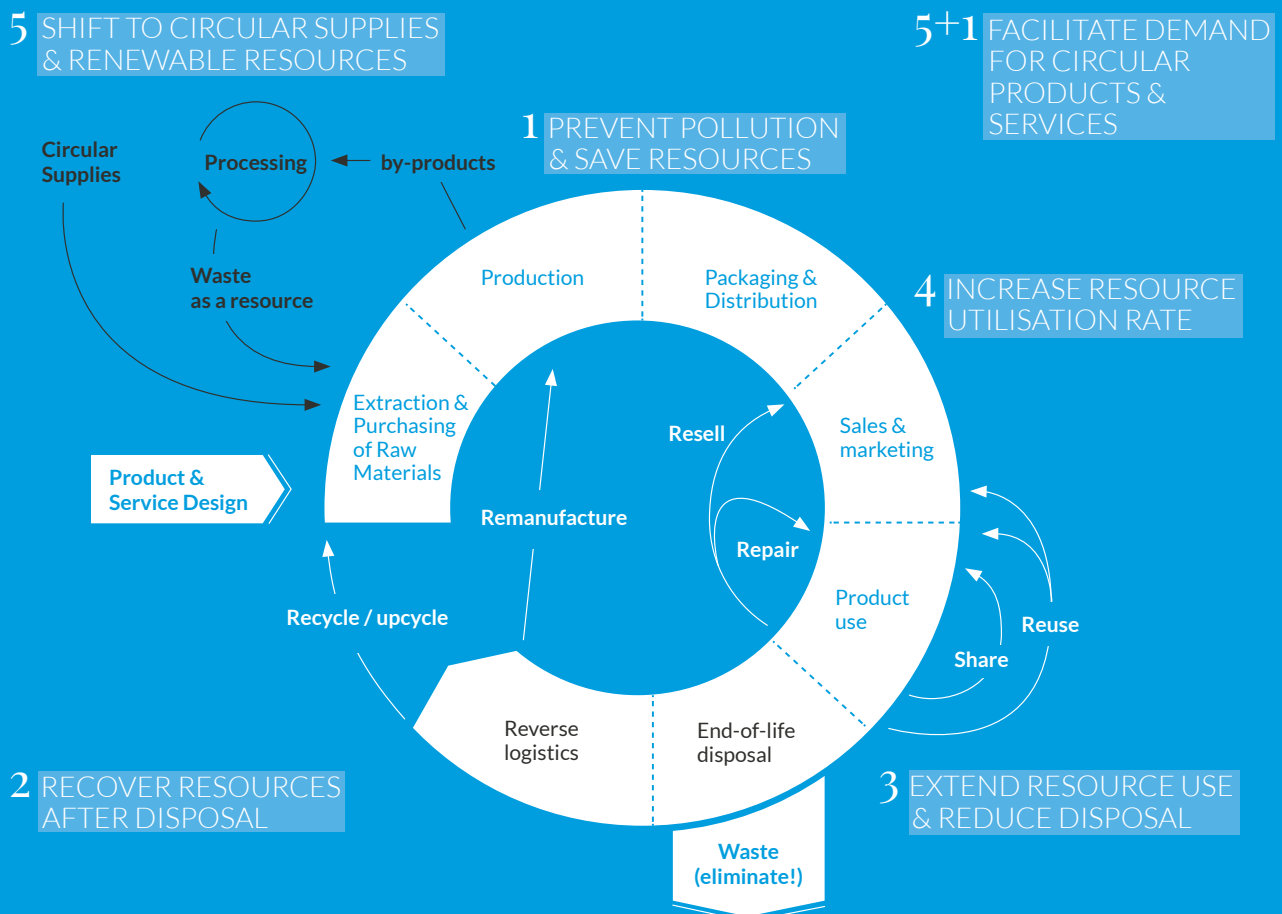


Figure 4. Circular economy strategies

Strategy 1 : Prevent Pollution and Save Resources

This strategy is principally related with the manufacturing stage and aims at saving resources (i.e. raw material, water, energy) and preventing pollution. Usually, this strategy is linked with eco-innovations that affect production processes, including making those processes cleaner and more efficient (e.g. recycling onsite scraps, recycling wastewater in-house) so that they generate less waste and emissions and need fewer resource inputs, i.e. water, energy, and chemicals (UNIDO, 2019-b).

On the one hand, products and services are designed and production processes are organized in order to minimize all sources of waste and emissions. The aim is to eliminate air, water, and ground pollution linked with production processes. The most common pollutants that industries release are CO₂, petroleum hydrocarbons and petrochemicals, solvents, agrochemicals (pesticides, fertilizers, etc.), heavy metals, microplastics, sulfur and nitrogen oxides, persistent organic pollutants (POPs), etc.

The strategy also seeks a maximum reduction in the materials and energy needed to produce something. The intention is to produce the same product or service using significantly less raw materials and energy, or transform the product or service in a way that maximizes resource and energy efficiency in the production process (by reducing the use of resources, reducing the diversity of materials used, designing smaller and lighter products, reducing steps in production processes, reducing packaging, etc.).

Hence, the business opportunities are mainly associated with the economic and environmental benefits obtained through cleaner, resource-efficient, and zero-waste production. Relevant business model: Cleaner, Resource-Efficient, and Zero-waste Production.

Relevant business model:

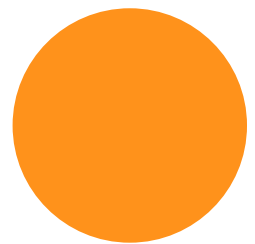
Cleaner, Resource-Efficient, and Zero-waste Production.



Cleaner, Resource-Efficient, and Zero-waste Production

This business model aims to implement cleaner and resource-efficient production within the facility, providing both environmental and economic benefits. The model, which includes a zero-waste approach as well, mainly creates value through process eco-innovation and the following eco-efficient measures: pollution prevention and reduction of resource consumption at the source (better process control, input changes, equipment modification and new process technologies); re-use and recycling of materials; and product eco-design, which is generally linked with improving input materials, especially chemicals and helps clean up the production processes as well.

From the fashion industry perspective, this includes saving water and energy, eliminating or minimizing chemicals, reduction waste, and using of low-impact and recycled feedstock. There are also opportunities to reduce the waste generated during garment production in the form of materials off-cuts and internal recycling.



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Key Partners / Stakeholders

- Raw material (fiber, yarn, fabric, etc.) and chemical suppliers that provide eco-friendly inputs and improve eco-efficiency
- Equipment and machinery suppliers that provide more efficient manufacturing systems and improved services
- Employees that implement and contribute to the cleaner production measures
- Customers (brands&retailers) that collaborate to develop more eco-efficiently produced materials, garments, and accessories
- R&D centers, universities, and consultants that collaboratively conduct the relevant R&D work and projects
- **Cleaner production centers that provide technical and capacity development support**
- Banks, investors, and other organizations that provide access to funding
- Public organizations that set the relevant regulations and standards and encourage such measures
- NGOs that help communicate the impacts of cleaner production measures
- Citizens that benefit from sustainable practices



Key Activities

- Conducting cleaner production and energy efficiency audits
- Identifying cleaner production opportunities
- Identifying priority areas through life cycle assessments, material flow analyses, etc.
- Conducting technical and economic feasibility studies
- **Developing and implementing cleaner production, energy efficiency and zero-waste action plans**
- **Purchasing equipment and tools for cleaner production of materials, garments, and accessories**
- **Monitoring inputs and outputs**
- Setting and implementing environmental management systems
- Cooperating with suppliers, consultants, and customers
- Conducting supplier checks and audits
- Training employees, contractors, and suppliers on cleaner production and resource efficiency measures and internal recycling of scraps
- Communicating with suppliers, customers, public organizations, NGOs, and other stakeholders



Value Propositions

- Provide brands&retailers with more circular and eco-friendly materials or garments and accessories and at reduced prices due to reduced operational costs
- Provide consumers with more circular and eco-efficiently produced garments and accessories, allowing them to reduce the environmental footprint of their fashion purchase practices

Key Resources

- Human resources
- Inputs including internal textile scraps, natural dyes, or low-impact chemicals and other accessories such as zips, buttons, etc. compatible with eco-efficiency targets
- Machinery and equipment for more eco-efficient production, including those for material recycling
- Energy and water
- Infrastructure: factories, offices, office material
- **Production process monitoring systems**
- Investment capital for new equipment and technologies
- R&D and innovation infrastructure
- Consultants and other external experts



Customer Relationships

- Joint projects and activities with brands&retailers that improve circular and eco-efficiency performance
- Relationships formed during compliance audits and when brands&retailers report their processes
- Stronger relationships with and commitments from brands&retailers
- Relationships with consumers that are more trustful and last longer
- Business-to-business commercial relationships and offline/online points of sale that provide opportunities for CE-related relationships with customers

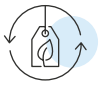
Channels

- **For businesses:**
 - Sales: fairs, e-business portals, wholesales
 - Communication: fairs, websites, social media, emails, phone calls, conferences/sectoral meetings
- **For consumers:**
 - Sales: website, apps, shops
 - Communication: websites, social media, emails



Customer Segments

- Brands&retailers that produce/sell more eco-efficiently produced garments and accessories and are engaged with circular and sustainability practices
- Consumers seeking more circular and eco-friendly produced garments and accessories



Cost Structure

There are possible cost items associated with audits, implementation and sustainability:

- Human resources
- External experts and contractors
- Costs related with measurement, analysis and monitoring
- Costs related with R&D activities, trials and tests
- New equipment and technology investments
- Maintenance costs including repair and refurbishment activities
- Higher unit prices of low-impact chemicals, dyes, fabrics and other raw materials, if applicable
- Rental or acquisition of physical infrastructure (workshops, factories)
- Logistics infrastructure
- Production costs (energy, water, maintenance, etc.)
- Permit/license and certification procedures
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with reduced costs and additional sales:

Cost reductions:

- Reduced use of raw materials and chemicals
- Water consumption and wastewater treatment
- Energy use
- Waste management and disposal
- Compliance with legislation and standards
- Increased process efficiency and productivity

Additional sales:

- Additional sales due to increased competitiveness (lower costs and prices)
- New markets for more circular and eco-friendly produced materials
- New customers for more circular and eco-efficiently produced materials

Feasibility and pay-back periods depend on the current level of eco-efficiency and extent of the measures to be applied. Pay-back periods generally vary between a couple of months to a couple of years

Potential Impacts



Economic

- Increased resource efficiency and reduced costs at both company and value chain levels
- Development of new products and new markets
- Increased demand for cleaner production and energy efficient services



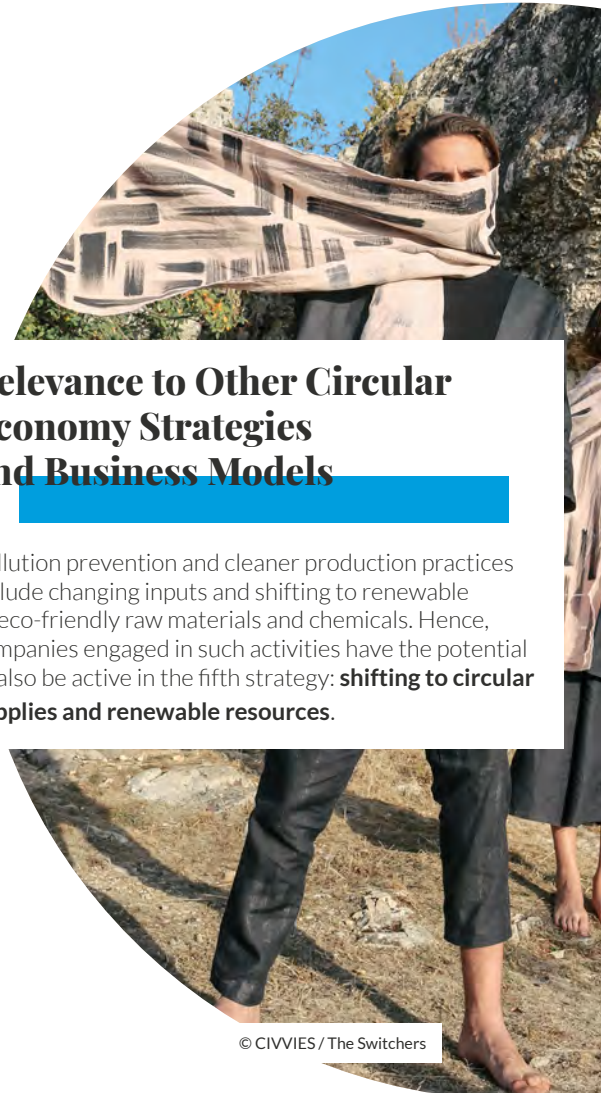
Environmental

- Reduced chemical (hazardous and non-hazardous) use in production processes
- Eliminated/reduced hazardous chemicals content in the products
- Reduced GHG emissions
- Reduced water and energy consumption
- Reduced amount of textile waste sent to landfills
- Improved compliance with regulations and standards



Social

- A safer and cleaner environment for the community
- Products that contain no/less hazardous chemicals for consumers
- Lower-price products for consumers due to reduced production costs
- Job creation in the cleaner production services market
- Increased collaborations and interactions between companies and all stakeholders



Relevance to Other Circular Economy Strategies and Business Models

Pollution prevention and cleaner production practices include changing inputs and shifting to renewable or eco-friendly raw materials and chemicals. Hence, companies engaged in such activities have the potential to also be active in the fifth strategy: **shifting to circular supplies and renewable resources**.

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Replicability in the South Mediterranean

Pollution prevention and cleaner production programs have been in place in the South Mediterranean countries for more than two decades. They include both UN-supported programs and governmental initiatives. These countries have cleaner production centers or equivalents, helping companies enhance their capacity not only for

cleaner production but also for other relevant concepts that evolve based on the sustainability agenda. The textile (especially its wet processing) and leather industries are among the priority industries due to their high resource consumption and environmental impacts.

Opportunities and Challenges for Businesses

Companies operating in these sectors in the South Mediterranean countries already have experience in and an understanding of pollution prevention and cleaner production, but there is much untapped potential, especially in terms of shifting to more sustainable inputs and advanced technologies, regardless of the size of the plants. Despite Turkey's developed textile and leather manufacturing industries and extensive processes, there is great potential to build up its cleaner and resource efficient practices. This is also the case for the South Mediterranean countries, mainly Morocco, Jordan, Tunisia, and Egypt, where textile processes are relatively extensive.

The zero-waste campaign⁹ recently launched in Turkey is also expected to positively influence all industries, including textile and leather, in terms of pollution prevention and resource efficiency.

Opportunities and Drivers for Businesses

- Much room for improvement in cleaner and resource-efficient production both in textile and leather industries, especially wet processing facilities
- Expanding international markets for eco-friendly materials and products and the potential of increasing exports thereof
- Supportive legislation and finance opportunities in Turkey (zero-waste regulation, regional development agency supports, etc.)
- Business creation opportunities due to increased demand for expertise, services and supplies for cleaner production
- Opportunity to apply other circular economy strategies once cleaner production capacity and infrastructure improves
- Opportunity to improve company competitiveness and reputation

Challenges and Barriers for Businesses

- Human resource and external consultancy needed for audits and implementation
- Investments needed especially for new equipment and technologies
- Insufficient R&D and innovation capacity
- Insufficient incentives and financial aids
- Suppliers' limited ability to provide sustainable inputs
- Conventional expectations of customers and challenges in persuading them to use modified materials
- Underdeveloped local markets and demand for eco-friendly products
- Challenges in communicating the value and benefits of cleaner production efforts for customers and consumers

Opportunities and Challenges for Consumers

Consumers may possibly enjoy reduced prices with according cost reduction achieved during production. They will also enjoy safer and healthier products where particularly hazardous chemical content is eliminated or reduced.

On the other hand, it is a challenge for consumers to differentiate eco-friendly products from others and find the right purchasing channels. In some cases, they may also encounter relatively higher prices for such products, due to the higher price of input materials.

[Check out some case studies here.](#)

⁹The Zero Waste Project was initiated by Turkey's Ministry of Environment and Urbanization in 2017. The project has introduced a new approach to waste management that considers waste to be a resource. <http://zerowaste.gov.tr/>

Strategy 2 :

Recover Resources After Disposal

The second strategy seeks to prevent resources from being discarded during the life cycle of a product, especially at the end of its life. The goal is to systematically replace disposal and landfill with reuse and recycling. This strategy is related to both the design-production and post-consumer-disposal phases.

Regarding the production stage, industrial symbiosis strategies can cover companies' complementary needs, matching and harmonizing their production processes: the waste management requirements of one company meet the resource needs of another. Thus, the by-products, wastes, and emissions of one production process become the inputs for another process.

For the end-of-life stage, the conceptual aim is to put an end to the idea of waste. Once a product becomes useless to the consumer, there should be a way to recover and recycle it back into production. Collection and recycling/upcycling systems and services are needed to implement this strategy.

This point of view should start at the design stage of the product. Efforts should be made to enable the easy recovery and recycling of materials and products through appropriate design features.

Relevant business models:

Design for disassembly, reassembly and recycling

Collection and recycling

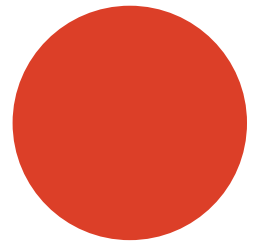
Upcycling



Design for Disassembly, Reassembly, and Recycling

Once a product ceases to be functional, this business model recovers and recycles it back into production without discarding it. To this end, the product should be designed so that it can be easily disassembled, reassembled, and recycled when it reaches the end of its life. This can be achieved by using recyclable materials, avoiding mixtures of a variety of materials, and using easily separable components.

From the fashion industry perspective, this business model includes using unblended materials, like 100% cotton or another natural material, 100% polyester, non-hazardous dyes and finishes, etc., as well as avoiding zips, buttons, etc. that are difficult to separate, which obstruct processing. It is also linked to an eco-design approach. Considering the limitations of current collection and recycling facilities in the fashion industry, ensuring that the materials and products are compostable/biodegradable, in case they do not get recycled, is complementary to this business model. If a product contains both compostable and non-compostable parts, they should be easily separable so that the compostable parts can be treated appropriately.



Business Model Canvas



Key Partners / Stakeholders

- Suppliers of fabrics, non-hazardous dyes, buttons, zips, etc
- Equipment and machinery suppliers for dyeing, cutting, sewing, and ironing
- **Designers and consultants, R&D centers, and universities for eco-design support**
- Employees, including tailors and vendors
- Customers: consumers and brands&retailers
- **Collection and recycling companies, brands, retailers, and designers that use recycled fabrics or garments and are interested in recycling clothes**
- Banks, investors and other organizations providing access to funding
- Public organizations: municipal, regional, and national governments that implement measures to encourage businesses
- Citizens that benefit from sustainable practices



Key Activities

- **Implementing a life cycle thinking approach and eco-design measures to ensure the circularity of garments through biodegradability, easily separable components, and unblended materials (100% cotton or polyester)**
- Sourcing alternative raw materials and doing supplier checks to ensure product and material certification
- Purchasing equipment and tools to manufacture clothes
- Garment manufacturing processes (dyeing, cutting, sewing, and ironing)
- Setting up the infrastructure to manufacture and sell clothes
- Sales and distribution activities especially relevant to the communication of eco-design practices
- Communicating and interacting with consumers, suppliers, public institutions, NGOs, and other stakeholders



Value Propositions

- **Provide consumers with garments and accessories that are easy to recycle, which reduces the environmental footprint of purchasing and using clothing**
- **Provide brands&retailers with garments and accessories that are easy to recycle, thus supporting and improving their circularity strategies**
- **Allow end-of-life customers, such as brands and designers with a take-back system and recycling companies, to easily identify material composition, sort garments, and implement recycling techniques and processes**

Key Resources

- Human resources
- **Strong eco-design capabilities**
- **Biodegradable fabric, natural dyes, and other materials needed to manufacture garments**
- Machinery and equipment for dyeing, cutting, sewing, and ironing
- Energy and water
- Vehicles for distributing clothes
- Premises (factories and workshops)
- Offline and online sales infrastructure (websites, social media, apps, and physical shops)
- Office equipment
- Investment capital



Customer Relationships

- **Relationships with conscious consumers that are more trustful and last longer**
- **Stronger relationships and greater commitments between retailer and manufacturer**
- Business-to-business commercial relationships and offline/online points of sale that provide opportunities to create CE-related relations with the customers

Channels

- For consumers:**
- Points of sale: websites, apps, shops, markets
 - Communication: websites, social media, email
- For businesses:**
- Points of sale: fairs, e-business portals
 - Communication: websites, email, phone calls



Customer Segments

- **Consumers interested in purchasing garments and accessories designed to facilitate reuse and recycling**
- More common for affordable luxury and the customer segments with larger sale shares and sustainability awareness: the premium segment, young to middle aged group, womenswear
- **Brands&retailers interested in selling clothes that are easy to reuse and recycle**



Cost Structure

There are possible cost items associated with eco-design practices, production and communication:

- Human resources for eco-design, manufacturing, and selling
- External experts and designers for eco-design and manufacturing
- Costs related to trials and tests of eco-design measures
- Purchase of materials such as fabrics and other garments components
- Purchase and setting up of equipment and tools for dying, cutting, sewing, and ironing
- Rental or acquisition of physical infrastructure (shops, workshops, factories) and office material
- Production costs (energy, water, maintenance, etc.)
- Transportation and distribution costs
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with sales:

Post-Consumer:

- For designers and small brands: revenue from selling to consumers
- For manufacturers: revenue from selling to retailers and brands

Feasibility and pay-back periods depend on the availability and cost of new inputs that support recyclability, the extent of the additional investments required, and the relevant markets that can be reached



Potential Impacts



Economic

- Increase in the demand for recyclable materials
- Expansion of the sustainable garment and accessories market
- Value and savings created through the use of recycled materials and elimination of virgin materials
- Expansion of the garment and accessories collection and recycling sector
- Reduction in costs associated with landfilling and incinerating end-of-life products



Environmental

- Reduction in the overall environmental impacts stemming from the extraction, processing, and waste management of non-recyclable materials products
- Reduction in the amount of garment and accessories waste landfilled or incinerated
- Improvement in the eco-design and sustainability perspective at both company and value chain levels



Social

- A safer and cleaner environment for the community
- Job creation and an increase in the demand for sustainable fashion designers
- Job creation in the garment and accessories collection and recycling sectors
- Raised awareness among consumers of eco-designed products

Relevance to Other Circular Economy Strategies and Business Models

- **Design for disassembly, reassembly, and recycling** is associated mainly with the use of recyclable materials and ease of separation of non-recyclable components. Hence, this business model is closely related and complementary to the collection and recycling business model.
- It is also linked with eco-design practices focusing on eliminating/reducing hazardous chemicals from products and production, which is part of the first strategy's business model, **cleaner and resource-efficient production & zero-waste production**.
- This business model goes hand in hand with the fifth strategy, **shifting to circular supplies and renewable resources**, since using recyclable materials promotes the use of recycled and circular supplies.
- Disassembly and reassembly features which improve recyclability can also support the third strategy, **extending resource use and reducing disposal**, by giving consumers the flexibility to use products in different ways and combinations or easily get them repaired. Hence it is possible for companies to implement both strategies at the same time, where feasible and applicable.

Replicability in the South Mediterranean

Design for disassembly, reassembly, and recycling is not a common business in the South Mediterranean. This is mainly because the local market and demand for recyclable garments has yet to grow, and eco-design is not mainstream in this industry. Besides, end-of-life garments are not efficiently collected and recycled.

There are companies producing recyclable collections, but such collections are generally exported and supplied to international brands.

Opportunities and Challenges for Businesses

In international markets, southern Mediterranean textile and apparel producers may be seeing higher demand from international brands for garments designed to be recycled, which might increase export potential. In local markets on the other hand, "design for recycling" may be developed in parallel with raised consumer awareness and increased demand for recyclable garments as well as improvements in collection and recycling systems. Some fashion designers are emphasizing the need for recyclable and circular designs. They have their own brands or provide expertise and consultancy for other brands and companies.

Opportunities and Drivers for Businesses

- Gradual expansion of international markets for recyclable materials and products
- Demand in recyclability from international customers and brands purchasing from and/or manufacturing in the South Mediterranean
- Existence of natural, recyclable materials, particularly in Turkey (cotton and hemp), Egypt (cotton), and Algeria (hemp)
- Business creation opportunities due to increased demand for expertise and consultancy for eco-design
- Opportunity to improve company competitiveness and reputation through design for recycling
- Opportunity to improve a company's capacity for eco-design and make way for the implementation of other circularity strategies

Challenges and Barriers for Businesses

- Immature local markets and demand for recyclable products
- Insufficient collection and recycling infrastructure for post-consumer waste
- Current and mainstream use of blends and difficult-to-recycle types of yarns (blends of cotton and polyester, polyamide, acrylic, etc.)
- Lack of human resources and external consultancy needed for R&D and eco-design
- Insufficient R&D and innovation capacity
- Suppliers' limited ability to provide recyclable/certified inputs
- Higher prices for recyclable/certified inputs
- Investment needed especially for new equipment and technologies
- Challenges in communicating the value and benefits of designing for recycling

Opportunities and Challenges for Consumers

Where particularly hazardous chemical content is eliminated or reduced to improve recyclability, consumers will be using safer and healthier products. Ease of disassembly and reassembly may also help extend product use and reduce disposal, if designed appropriately.

On the other hand, it is a challenge for consumers to differentiate recyclable products from others and find the right purchasing channels. Consumers may also have difficulty finding the right collection points to deposit end-of-life products, even when they know that the products are recyclable. In some cases, they may also encounter relatively higher prices for such products due to higher prices of input materials and improved production processes.

[Check out some case studies here.](#)

Collection and Recycling

This business model includes collecting, sorting, and recycling wastes as well as selling recycled materials. However, not all recycling creates the same value. When a material is transformed into something of lesser value, it is “downcycled”. Some companies implement all these activities, and some specialize in only one or two of them. The business model also refers to creating and managing a network of companies through which all relevant activities of the collection, sorting, and recycling processes are implemented in coherence. Collection and recycling businesses are critical for implementing the strategy of recovering resources after disposal. It is relevant to both production waste and end-of-life garments, or pre-consumer and post-consumer waste (respectively).

Pre-consumer waste collection/ recycling in the fashion industry:

Yarn, fabric, and garment manufacturing companies generate various types of yarn and fabric wastes that differ in structure, content and size. If they can be appropriately separated within the manufacturing facility, textile recycling companies buy and recycle them to produce recycled/regenerated fibers. This works very well with 100% pure cotton or polyester, but is also applicable to blended materials like polyester/cotton. These are all industrial symbiosis practices, improving circularity and collaboration among businesses.

Post-consumer waste collection/ recycling in the fashion industry:

This consists of collection systems, either at sale points or other collection points through collection bins, and of implementing other methods such as leasing or take-back systems. Collected items are sorted, rewearables are diverted to re-use channels, and the remaining material goes to recycling facilities. Currently, the most common recycling activity consists of producing insulation materials for the automotive and construction industries and using absorbent textiles to produce cleaning cloths, which are in essence downcycling activities. Quite a small portion of waste has been recycled back into yarn production in the form of regenerated fibers, mainly because of the complexity of mixed fibers and lack of a scalable technology.



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Key Partners / Stakeholders

- Customers: garment manufacturers, brands&retailers, recycled textile buyers, and municipalities
- Suppliers: logistics companies and cooperating collection or recycling partners
- Retailers that cooperate to collect used garments and accessories (for post-consumer only)
- Partners that organize re-use channels (for post-consumer only)
- Equipment and technology suppliers that collect and recycle pre and post-consumer textile wastes
- R&D centers and universities that improve sorting and recycling techniques
- Certification organizations
- Banks, investors and other organizations that provide access to funding
- Municipalities and NGOs that cooperate to collect end-of-life garments and accessories (for post-consumer only)
- Employees
- Public organizations: municipal, regional, and national governments that implement measures to encourage businesses
- Other public organizations that provide policy support and licenses for waste collection and acquisition
- Citizens that benefit from sustainable practices



Key Activities

- Identifying and characterizing the textile waste to be collected and recycled
- Identifying, sorting and recycling needs and technologies
- Engaging with waste producers (yarn/fabric/garment producers and consumers), collection partners, and other suppliers
- Identifying collection points and network
- Identifying the suitable recycled fiber/yarn market and engaging with potential buyers
- Identifying or arranging re-use channels for wearable items that would be sorted from wastes (for post-consumer only)
- Purchasing equipment and tools to collect and recycle pre and post-consumer textile wastes
- Setting up the collection, sorting, and recycling infrastructure
- Sales and distribution activities especially relevant to the communication of collection and recycling practices
- Completing relevant permit/license procedures for taking and processing wastes, if applicable
- Certifying recycled materials
- Cooperating with suppliers, municipalities, NGOs, and customers; training partners/ stakeholders and raising their awareness
- Communicating with consumers, suppliers, public institutions, NGOs, and other stakeholders



Value Propositions

- Pre-Consumer:**
- Provide textile manufacturers with the opportunity to sell their waste rather than paying to dispose of it
 - Provide textile manufacturers with recycled fibers
 - Provide textile manufacturers with recycling services so their textile waste can be converted into fiber and re-introduced into their production
 - Provide brands&retailers with the opportunity to valorize their unsold garments for which a more efficient way of utilization does not exist
 - Provide municipalities with collection and recycling services
- Post-Consumer**
- Provide brands&retailers with collection, sorting and recycling services for their own products, increasing extended producer responsibility
 - Provide textile manufacturers with fibers recycled directly from their own products that have been discarded by consumers
 - Provide municipalities with collection and recycling services

Key Resources

- Human resources
- Textile scraps and clothes and accessories from textile/garment producers and consumers
- A reliable supplier and cooperation network
- Logistics infrastructure and vehicles for collection and distribution
- Machinery and equipment for collection and recycling
- Premises (factories, workshops and storage)
- Energy and water
- Offline and online sales infrastructure (website, social media, apps, physical shops)
- Office equipment
- Investment capital



Customer Relationships

- Collection-Recycling:**
- Effective collection systems, intermediaries, and networks
 - Long-term agreements and commitments
 - Business-to-business commercial relationships
- Selling recycled materials:**
- Strong and trustful relationships through standardized materials and the ability to meet customers' specific needs
 - Business-to-business commercial relationships and offline/online points of sale that provide opportunities to create CE-related relationships with customers
 - Commercial networks
 - Using customer references

Channels

- Collection and recycling:** direct collection, intermediaries, e-business portals
- Selling recycled materials:** websites, fairs, e-business portals, offline sales
- Communication:** websites, email, phone calls, social media



Customer Segments

- Pre-Consumer:**
- Textile manufacturers generating yarn/fabric wastes
 - Yarn, fabric and garment manufacturers willing to use recycled materials
 - Brands&retailers willing to valorize their unsold garments
 - Municipalities or municipality companies looking for solutions for pre-consumer wastes they receive
- Post-Consumer:**
- Brands&retailers willing to collect end-of-life garments from consumers and valorize them
 - Manufacturers, brands &retailers which aim to take the responsibility of their products and have a circular supply chain
 - Yarn, fabric and garment manufacturers willing to use recycled materials
 - Municipalities or municipal companies interested in managing post-consumer wastes



Cost Structure

There are possible cost items associated with feasibility/R&D, investment, and operation/sustainability:

- Human resources
- Purchase of wastes (pre and post-consumer textile wastes and other)
- Purchase and setting up of a production line for recycling
- Logistics and transportation costs
- Costs associated with R&D, pilot productions, tests, analyses and monitoring
- Rental or acquisition of physical infrastructure (workshops, factories) and office materials
- Logistics infrastructure
- Transportation and distribution costs
- Production costs (energy, water, maintenance, etc.)
- Permit/license and certification procedures
- Costs for customer-supplier network management
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with services and sales:

Services:

- Collection and collection system management services
- Sorting and recycling services
- Recycling services for manufacturer-specific wastes

Sales:

- Recycled material sales
- Rewearable garments sales

Pre-consumer wastes is generally feasible for several reasons:

- Waste producers would have to pay for the disposal of their wastes if they didn't sell it to recyclers
- Pre-consumer wastes are generally in good quality and have not been worn, and their composition is known, yielding easily and efficiently regenerated fibers
- There is a good market for regenerated fibers, and their price may even be higher than virgin materials

For post-consumer wastes, feasibility depends on several factors:

- Consumer habits related to using end-of-life garments collection systems
- Content and structure of the collected items
- Whether the technologies for sorting and recycling are sufficiently advanced
- The infrastructure available for collection and sorting
- The number of available partners to collaborate with



Potential Impacts



Economic

- Expansion of the garment collection and recycling sector
- Expansion of recycled materials market
- Increase in demand for recyclable materials
- Value and savings created through recycled materials
- Value created through separating rewearable products



Environmental

- Reduction in the overall environmental impacts stemming from the extraction and processing of virgin materials
- Reduction in the overall environmental impacts stemming from the management of the textile and garment wastes
- Reduction in the garment wastes landfilled or incinerated



Social

- Safer and cleaner environment for the community
- Job creation in the garment collection and recycling sectors
- Raising consumer awareness of recycling and recyclable products
- Job creations and an increase in the demand for sustainable fashion designers

Relevance to Other Circular Economy Strategies and Business Models

- **Collection and recycling** is directly linked with **designing for disassembly, reassembly, and recycling**, another business model for this same strategy. Both business models promote each other.
- It also goes hand in hand with the fifth strategy, **shifting to circular supplies and renewable resources**, because recycling promotes the use of recycled materials and helps close loops.
- Internal recycling of a producer's pre-consumer waste by means of an external recycler is a cleaner production practice and hence supports the first strategy: **preventing pollution and saving resources**.
- Since it is possible to separate rewearable garments from the collected post-consumer items, collection also paves the way for **reselling**, which is a business model for the third strategy: **extending resource use and reducing disposal**.

Replicability in the South Mediterranean

In Turkey, there has been a well-established recycling industry for pre-consumer textile waste for more than three decades. For this industry to grow and stay competitive, improvements in quality, traceability, and certification are necessary. Mixed and lower-quality waste is used to make felt (nonwoven fabric) which generally becomes insulation material for the automotive and construction industries. Recently in Morocco, a textile recycling plant and a spinning mill that processes recycled fibers was established as part of the Circular Textile Cluster project, implemented jointly by Hallotex, Textil

Santanderina, Vich Industrial, and the Austrian Lenzing Group. In some countries on the other hand, pre-consumer textile waste is exported, and entrepreneurs have difficulty reaching out to textile producers to take their waste.

For post-consumer waste, on the other hand, an efficient collection and recycling system does not exist. In Turkey, H&M has been collecting end-of-life garments but shipping them to Europe for recycling. A couple of municipalities have distributed collection bins, and the collected garments that are in good condition are selected for reuse purposes.

Opportunities and Challenges for Businesses

Based on the increased demand for recycled materials and companies' efforts to recycle their own waste, this business area has the potential to grow. Turkey's existing infrastructure for textile recycling has the opportunity to upgrade in order to address post-consumer waste as well. International brands and large manufacturers may be willing to support the establishment of a collection and sorting system. In the South Mediterranean countries, textile recycling is a relatively new area, and there is potential for starting collection and recycling businesses primarily for pre-consumer waste, taking into consideration the production and importing activities of international customers in these countries.

Opportunities and Drivers for Businesses

- Gradual expansion of international markets for recyclable and recycled materials and products
- Potential demand for recyclability from international customers and brands purchasing from and/or manufacturing in the South Mediterranean
- High potential all over the world for recycling post-consumer waste in an efficient and value-added way
- Possible access to improved and new technologies for sorting and recycling
- International brands and large manufacturers' view on the need for collecting and recycling post-consumer waste and the upcoming EPR requirements
- Well-established textile recycling industry which is still growing (especially in Turkey)
- Possibility of using existing recycling infrastructure for post-consumer waste (especially in Turkey)
- End-of-life garment collection activities conducted by H&M for the last couple of years (especially in Turkey)
- Waste disposal costs that the manufacturers are subject to, for pre-consumer textile waste (especially in Turkey)
- Initiatives for establishing textile recycling plants and a spinning mills that process recycled fibers (as in Morocco), collaboratively with international brands that are active in the region

Challenges and Barriers for Businesses

- Insufficient collection and recycling infrastructure for post-consumer waste
- Current and mainstream use of blends and not readily recycled types of yarns (blends of cotton and polyester, polyamide, acrylic, etc.)
- Efficient sorting required to obtain high-quality regenerated fibers
- Insufficient R&D and innovation capacity
- Higher prices for recycled inputs
- Difficulty of taking textile waste from textile companies
- Investment needed for collection, sorting, and recycling systems
- Technologies needed for sorting and recycling
- Risk of consumers not using end-of-life garment collection systems
- Need for many parties to partner with, for establishing a system for post-consumer waste

Opportunities and Challenges for Consumers

Through post-consumer collection systems, consumers will be able to give their end-of-life garments and accessories a second life. Their awareness of sustainability and circularity will increase, as will their motivation to adopt more sustainable forms of living. Consumers can also be given a voucher or an incentive in return for depositing their end-of-life products at collection points. There may also be challenges if collection points are not easily accessible or too few in number.

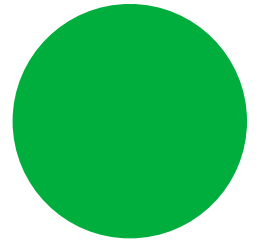
[Check out some case studies here.](#)

Upcycling

Recycling is a general term used for the processes of collecting and processing waste, by-products, or other materials that would otherwise be discarded and converting them into new products. In contrast to recycling processes, where the new products have a lower value than the original, upcycling processes transform the material into products with greater value. Thus, as a business model, upcycling is the transformation of useless or unwanted products into new materials or products of better quality.

In the fashion industry, only 13% of textile inputs are converted into new materials or products. Just 1% is recycled back into the fashion industry, where it maintains its value, while the remaining 12% is used in other industries generally as insulation material or cleaning cloth, meaning that it has been downcycled. These figures show that upcycling practices in the fashion industry are rather limited as far as waste and other unwanted materials generated throughout a product's life cycle are concerned.

On the other hand, it is also known that 2% of all textile inputs are feedstock recycled from other industries, so that's where the current upcycling examples and opportunities in the fashion industry can be found. Producing synthetic fibers from PET bottle waste is a good example. The fashion industry continues to show high potential for increasing fashion-to-fashion recycling as well as using upcycled feedstock from other industries¹⁰.



¹⁰ The possible leakage of plastic microfibers from the washing of plastic-based textiles should be assessed, as indicated in the section 'Environmental hotspots within fashion value chains in the South Mediterranean'. Innovative solutions to this issue are currently in development, such as the Cora Ball from Rozalia Project. The Cora Ball is a device that collects microfibers as well as hair during washing, preventing them from flowing out with the drain water (SCP/RAC, 2017)



Key Partners / Stakeholders

- Waste suppliers: textile companies, waste managers, NGOs that collect waste, and individuals that bring in old clothes
- Equipment and technology suppliers that manufacture garments and accessories
- Customers: consumers and brands&retailers
- Employees
- Banks, investors, and other organizations that provide access to funding
- Public organizations: municipal, regional, and national governments that implement measures to encourage businesses
- Other public organizations that provide policy support and licenses for waste collection and acquisition
- Citizens that benefit from sustainable practices



Key Activities

- Identifying materials to be upcycled for production (textile scraps, used clothing, and non-textile waste streams such as plastic bottles)
- Engaging with potential waste suppliers, including implementing collection methods
- Identifying required and suitable design features, including conducting test productions and getting feedback from potential customers
- Purchasing equipment and tools to manufacture garments and accessories
- Garment and accessories manufacturing processes (dyeing, cutting, sewing, and ironing)
- Setting up the infrastructure to manufacture and sell clothes
- Sales and distribution activities especially relevant to the communication of upcycling practices
- Completing relevant permit/license procedures for taking and processing waste, if applicable
- Communicating with consumers, suppliers, public institutions, NGOs, and other stakeholders



Value Propositions

- Provide consumers with upcycled garments and accessories, allowing them to reduce the environmental footprint of their fashion purchase practices
- Provide brands&retailers with upcycled clothes that support and improve their circularity strategies

Key Resources

- Human resources
- Wastes (textiles or other products likely to be transformed into fabric)
- Other materials needed to manufacture garments and accessories such as dyes, buttons, etc.
- Machinery and equipment for upcycling the product through dyeing, cutting, sewing, and ironing
- Energy and water
- Vehicles for collecting materials and/or distributing clothes
- Premises (factories and workshops)
- Offline and online sales infrastructure (websites, social media, apps, and physical shops)
- Office equipment
- Investment capital



Customer Relationships

- Relationships with consumers that are more trustful and last longer
- Usually, stronger relationships and greater commitments between retailers and manufacturers
- Powerful communication required to convey the quality of upcycled products
- Business-to-business commercial relationships and offline/online points of sale that provide opportunities to create CE-related relationships with customers

Channels

- For consumers:**
- Points of sale: websites, apps, shops, markets
 - Communication: websites, social media, email
- For businesses:**
- Points of sale: fairs, e-business portals
 - Communication: websites, email, phone calls



Customer Segments

- Consumers interested in purchasing garments and accessories produced from upcycled materials
- Brands&retailers willing to sell upcycled clothes and engaged in circularity and sustainability practices



Cost Structure

There are possible cost items associated with feasibility/design, investment, and operation/sustainability:

- Human resources
- Purchase of waste (textile or other)
- Purchase of other materials (fabrics, buttons)
- Purchase of equipment for creating fabrics
- Purchase of equipment and tools for dyeing, cutting, sewing, and ironing
- Rental or acquisition of physical infrastructure (shops, workshops, factories) and office material
- Production costs (energy, water maintenance)
- Logistics infrastructure
- Transportation and distribution costs
- Permit/license procedures
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with sales to consumers and/or brands&retailers:

The feasibility of this business model depends on finding favorable materials, in terms of cost, access, and continuity, as well as creating innovative, attractive, and value-added products from them. Such businesses generally start as a small-scale initiative and grow based on the market, demand, and creation of new collections/products

Potential Impacts



Economic

- Creation of new products and new markets
- Expansion of the recycling sector
- Expansion of the recycled materials market
- Value and savings created by recycled materials



Environmental

- Reduction in the overall environmental impacts stemming from the extraction and processing of virgin materials
- Reduction in the overall environmental impacts stemming from the management of the upcycled waste
- Reduction in amount of waste landfilled or incinerated



Social

- Safer and cleaner environment for the community
- Reduced prices probably due to low-cost raw materials
- Job creation in the recycling sectors
- Job creation and increased demand for sustainable fashion designers
- Job creation for women particularly, with some working from home
- Raising awareness among consumers of upcycled products

Relevance to Other Circular Economy Strategies and Business Models

- **Upcycling** is linked with **collection and recycling**, another business model for this same strategy, since upcycling also requires collecting waste material and upcycling opportunities can be identified for suitable materials before they are channeled to recycling.
- It also goes hand in hand with the fifth strategy, **shifting to circular supplies and renewable resources**, because upcycling promotes the use of recycled materials.

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Replicability in the South Mediterranean

Upcycling is one of the most implemented circular business models in the South Mediterranean countries, but generally as rather small-scale initiatives. There are several examples of garment, handbag, and accessories production from vintage material; dead-stock fabric, including curtains, bed sheets, mattresses, and second-hand clothes;

landfill waste; and scraps from large garment and textile factories. Other textile products such as handcrafted products, rugs, ottomans, and pillows are also produced from similar sources, but they are not generally considered upcycling in terms of a circular fashion industry.

Opportunities and Challenges for Businesses

There is great potential for replicating the existing upcycling examples in the South Mediterranean. It is also a good opportunity to involve women in such businesses. Yet for more value added and larger businesses, technical and design assistance may be required and detailed feasibility studies should be carried out. Another option is to cooperate with local or international brands and retailers and be their supplier for certain collections with special environmental and social concepts.

Opportunities and Drivers for Businesses

- Gradual expansion of international markets for up/recycled materials and products
- Potential demand for special-concept collections from local and international customers and brands purchasing from the South Mediterranean
- Experience and motivation through existing examples in the region
- Large number of textile companies operating in southern Mediterranean countries
- Large amount of waste from various industries being landfilled/incinerated, as potential alternative materials
- Waste disposal costs that the manufacturers are currently subject to
- Existing collection and recycling infrastructure (especially in Turkey)
- Potential for creating social businesses by involving people from different segments

Challenges and Barriers for Businesses

- Risks associated with market acceptance and demand
- Risks associated with consumers' trust and perception of the idea and the products
- Investment needed for waste processing and production
- Insufficient R&D, innovation and sustainable design capacity
- Market fluctuations in raw material (waste, etc.) prices
- Difficulty of taking textile waste from textile companies
- Risks associated with the continuity of raw material sources and the need for continuously finding new materials and suppliers
- Permit and license requirements, depending on the type of the waste used
- The need to be design-conscious and create contemporary and stylish products, taking into consideration aesthetics, besides sustainability

Opportunities and Challenges for Consumers

Upcycling makes it possible to use low-cost raw materials to obtain high-value products. This may allow consumers to buy high-quality and interesting products at relatively lower prices. Using upcycled products raises their awareness of sustainability and circularity and motivates them to adopt more sustainable forms of living.

On the other hand, consumers may find it challenging to adopt a new mindset about waste and the way they shop. It may take time to understand the idea as well as to trust and accept the origin of materials.

[Check out some case studies here.](#)

Strategy 3 :

Extend Resource Use and Reduce Disposal

The third strategy is concerned with the usage and maintenance phases. It aims at extending a product's lifetime, to the greatest possible extent, and avoiding its disposal. Achieving this starts at the design stage. Circular features such as durability, longevity, and modularity as well as repairability, upgradability, and reusability can all be implemented through eco-design principles. Modular design, for instance, can facilitate the repair and substitution of a product's components, extending its life.

Maintenance and repair services as well as upgrading opportunities are also critical for the user's continued use of the product. Certain types of products can be remanufactured and refurbished, which helps restore product's initial functionality. Another option for extending product lifetime is reuse and reselling practices such as second-hand commerce.

Relevant business models:

Design for durability, long lasting and modularity

Repairing and upgrading

Reselling

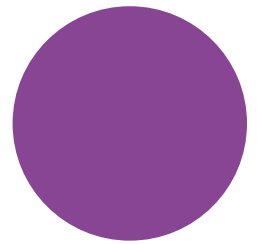


Design for Durability, Long Lasting and Modularity

In this business model, design is key for shaping how a product is manufactured and used and what happens when it is no longer needed or wanted. In other words, design features determine a product's circularity. For garments and accessories, product longevity is one of the biggest opportunities for reducing environmental footprints and enhancing circularity. If products have a longer usable life, they need to be replaced less frequently, facilitating less resource consumption and less waste generated.

Durability, long lasting and modularity are all interconnected and promote each other, being linked with several other features and practices associated with repair, upgrading, and resale. There are two types of durability, physical and emotional. Design for physical durability aims at creating garments and accessories that are resistant to wear and tear, and emotional durability is associated with generating product attachment and trust for consumers.

Durability helps products last longer, but there are several other factors. Ease of repair, disassembly, and reassembly; opportunities for upgrading; and usability for different occasions and in different ways are some other examples. Modular and standardized designs enable consumers to use garments and accessories in a flexible way, interchangeably in different combinations and styles, as well as easily repair, upgrade, substitute, and adapt them.



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Key Partners / Stakeholders

- Suppliers of fabrics, finishes, buttons, zips, and other materials
- Equipment and machinery suppliers for dying, cutting, sewing, and ironing
- Designers and consultants, R&D centers, and universities for eco-design support
- Employees
- Customers: consumers, brands&retailers, and resale and rental companies
- Banks, investors, and other organizations that provide access to funding
- Citizens that benefit from sustainable practices



Key Activities

- Implementing a life cycle thinking approach and eco-design measures to ensure the circularity of garments and accessories through durability, longevity, modularity, standardized designs, etc
- Identifying and developing suitable construction (stitching, assembly, etc.) techniques
- Sourcing suitable raw materials, finishes, buttons, zips, and other materials
- Purchasing equipment and tools to manufacture clothes
- Garment and accessories manufacturing processes (dying, cutting, sewing, and ironing)
- Setting up the infrastructure to manufacture and sell clothes
- Preparing and conveying use and maintenance guidelines that increase durability and longevity
- Sales and distribution activities especially relevant to the communication of eco-design practices
- Communicating with customers and other stakeholders



Value Propositions

- Provide consumers with garments and accessories that can be used for a long time and are easy to repair, upgrade, adapt, and resell, which reduces the environmental footprint of purchasing and using clothes and saves consumers' money
- Provide brands&retailers with durable, long-lasting, and modular garments and accessories, thus supporting and improving their brands and circularity strategies
- Provide resale and rental businesses with garments and accessories that can be used by multiple users and stand up to frequent maintenance



Customer Relationships

- Greater product attachment and trust from consumers as well as longer-lasting relationships
- Stronger relationships with and greater commitments from brands, retailers, and resale/rental companies
- Potential communication of instructions regarding usage, maintenance, repair, etc., resulting in continuous interaction with all types of customers
- Business-to-business commercial relationships and offline/online points of sale provide opportunities to create CE-related relationships with customers



Customer Segments

- Consumers interested in purchasing durable and long-lasting garments and accessories, with sustainability and/or economic expectations
- More common for sportswear, high-quality and luxury-premium segments, especially for the middle-aged group
- Brands&retailers interested in selling clothes that are durable and last long
- Resale and rental businesses looking for durable, long-lasting, and high-quality garments and accessories that can be used by multiple users and stand up to frequent maintenance

Key Resources

- Human resources
- Strong eco-design capabilities
- Materials that facilitate durability and longevity
- Construction techniques that facilitate durability, longevity, and modularity
- Machinery and equipment for dying, cutting, sewing, and ironing
- Energy and water
- Vehicles for distributing clothes
- Premises (factories and workshops)
- Offline and online sales infrastructure (websites, social media, apps, and physical shops)
- Office equipment
- Investment capital

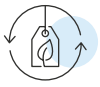
Channels

For consumers:

- Points of sale: websites, apps, shops
- Communication: websites, social media, email

For businesses:

- Points of sale: fairs, e-business portals
- Communication: websites, email, phone calls



Cost Structure

There are possible cost items associated with eco-design practices, production, and communication:

- Human resources for eco-design, manufacturing, and selling
- External experts and designers for eco-design and manufacturing
- Costs related to trials and tests of eco-design measures
- Purchase of materials such as fabrics, zips, buttons, and other garment components
- Purchase and setting up of equipment and tools for dyeing, cutting, sewing, and ironing
- Rental or acquisition of physical infrastructure (shops, workshops, factories) and office material
- Production costs (energy, water, maintenance, etc.)
- Transportation and distribution costs
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with sales and maintenance/repair services, if applicable:

Feasibility and pay-back periods depend on the market and demand for durable, long-lasting and modular products. The spread of slow fashion principles is expected to promote this business model as well. Strong design capabilities are also critical

Potential Impacts



Economic

- Increase in the demand for durable, high-quality materials
- Expansion of the sustainable garment and accessories market
- Value and savings created through reduced production and use of virgin materials
- Expansion of the garment and accessories repair and maintenance industries
- Expansion of the resale and rental sectors
- Reduction in costs associated with landfilling and incinerating end-of-life products



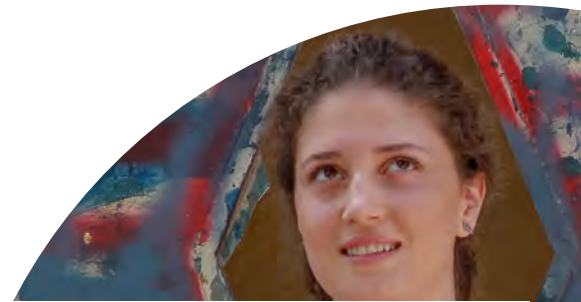
Environmental

- Reduction in the overall environmental impacts stemming from the extraction and processing of raw materials and from waste management of end-of-life products
- Reduction in the amount of garment and accessories waste landfilled or incinerated
- Improvement in the eco-design and sustainability perspective at both company and value chain levels



Social

- A safer and cleaner environment for the community
- Job creation and an increase in the demand for circular fashion designers
- Job creation in the repair and maintenance industries
- Economic advantages for consumers obtained by using products for longer times
- Raised consumer awareness of eco-designed products



Relevance to Other Circular Economy Strategies and Business Models

- **Design for durability, long lasting and modularity** is linked with **repairing and upgrading**. Repair and upgrading opportunities and relevant services help products last longer and be more durable. Modularity facilitates repair and upgrade practices.
- The more durable and long-lasting a product, the more potential it has in the resale and rental markets. Therefore, this business model supports **reselling** as well as the fourth strategy and its business model, associated with **renting and leasing**.



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Replicability in the South Mediterranean

Purchasing cheaper and relatively low-quality garments and accessories is quite common in the South Mediterranean with the influence of fast fashion. The younger generations especially do not generally seek durable and long-lasting products. Older people on the other hand are more used to high-quality and durable

clothes and are more prone to extending the life of their garments and accessories through repair, upgrading, and maintenance. This is mainly due to a tradition of being thrifty and temperate in consumption as well as a tradition of tailoring activities which also include repairing and upgrading.

Opportunities and Challenges for Businesses

As sustainability continues to drive youths' purchase practices, and rental and resale markets in the South Mediterranean, the demand for more durable and long-lasting garments and accessories is expected to increase. This can be a good starting point for promoting and marketing such products. It is also possible to engage the existing tailoring capabilities with these businesses. On the other hand, modularity and the use of modules to make different combinations may be interesting and attractive especially for young consumers.

Opportunities and Drivers for Businesses

- Gradual expansion of international markets for long-lasting products
- Growing resale and rental businesses for which durable and long-lasting items are preferred
- Traditions that support the extension of product lifetimes
- Existing tailoring capabilities which can be used to support lifetime extension and the modularity approach
- Possibility of young people's liking and adopting the modularity approach
- Business creation opportunities due to increased demand for expertise and consultancy for eco-design
- Opportunity to improve company competitiveness and reputation through durable and high-quality products
- Opportunity to improve company's capacity for eco-design and facilitate the implementation of other circularity strategies

Challenges and Barriers for Businesses

- Immature local markets and demand for durable, long-lasting, and modular products
- Dominance of fast fashion practices in the region
- Human resource and external consultancy needed for R&D and eco-design and creativity
- Specific construction techniques required to manufacture durable, long-lasting, and modular items
- Suppliers' limited ability to provide suitable materials for making durable and long-lasting products
- Higher prices of durable and high-quality inputs
- Investment needed especially for new equipment and technologies
- Challenges in communicating the value and benefits of designing for durability and long lasting

Opportunities and Challenges for Consumers

Designing for durability, long lasting and modularity provides consumers with more sustainable and high-quality garments and accessories. Consumers have the opportunity to extend the life of their goods, and thereby develop trust in and attachment to them. They can create a long-term relationship with the producer/seller and have the opportunity to save money in the long run.

On the other hand, it may be a challenge for consumers to appreciate the long-term advantages of such products and pay a relatively high initial price. They may also have difficulties following and implementing the relevant instructions, provided by the producer/seller, for taking good care of a durable, long-lasting, and modular product.

[Check out some case studies here.](#)

Repairing and Upgrading

Repairing is vital to extending the life span of products and making the most of them. As a business model, this means restoring a defective product's original function by renewing or replacing the problematic parts as well as through corrective maintenance activities. For fashion products, this may include replacing zippers, fixing tears or broken seams, replacing buttons or buckles, patching, etc.

There are several features and measures that facilitate a product's repairability:

- Design features such as easy disassembly, reassembly, standardization, etc.
- Availability of repair guides and information, together with repair kits, if applicable.
- Availability of spare parts and accessories at a reasonable price and that are easily accessible.
- Repair services.

Upgrading is also a way to extend product lifetime. It aims at updating and modernizing a product's function and introducing new features, modifying products according to the changing needs or taste of users. Upgrading fashion products includes restyling, customizing, making changes or additions that make the used products more fashionable, or creating higher quality garments or accessories out of the unwanted ones.

Repairing and upgrading as a business model creates different business opportunities and can be implemented in different ways. Brands and retailers can improve their brands by integrating repair and upgrade services for their products or providing support for the durability and longevity aspects of their products. And service providers can set up businesses that specialize in repairing and upgrading defective or unwanted products from different brands. They can service both consumers directly and also businesses (brands, retailers, rental and resale companies) as a supplier.





Key Partners / Stakeholders

- Designers that design garments and accessories for reparability/upgradability
- Suppliers of materials and spare parts like zips, buttons, etc.
- Equipment and machinery suppliers for dyeing, cutting, sewing, ironing, and other repairing/upgrading operations
- Service providers that repair/upgrade, collect, and deliver garments and accessories
- Customers: consumers, brands, retailers, and second-hand and rental businesses
- Employees
- Banks, investors, and other organizations that provide access to funding
- Citizens that benefit from sustainable practices



Key Activities

- Identifying repairing/upgrading needs and contexts
- Identifying a guarantee and pricing system
- Identifying technical needs, materials, and spare parts like zips, buttons, etc.
- Identifying required design features and conducting test productions for repairable/upgradable designs
- Engaging with suppliers, including service providers
- Engaging with brands, retailers, and second-hand and rental businesses (applicable to service providers)
- Setting up the infrastructure/network for repairing/upgrading, collection, and delivery
- Purchasing equipment and tools to repair/upgrade garments and accessories
- Preparing repairing/upgrading guides and kits for consumers and informing consumers about the system (applicable to brands&retailers)
- Providing repairing/upgrading services in collaboration with service providers
- Collecting information about the most frequent repairs made and giving feedback to designers, producers, and suppliers for possible product improvements (applicable to brands&retailers)
- Continuously communicating with consumers, other customers, and suppliers



Value Propositions

- Brands&retailers can provide consumers with repairable/upgradable garments and accessories as well as the ability to easily repair and upgrade or access repairing and upgrading services
- Service providers can offer consumers repairing and upgrading services for their existing defective or unwanted garments and accessories
- Service providers can also offer brands, retailers, and second-hand and rental companies repairing and upgrading services as part of their supply chain

Key Resources

- Human resources
- Strong design and tailoring capabilities
- Materials, spare parts, etc. needed for repairable/upgradable designs as well as repairing and upgrading processes and kits
- Machinery and equipment for dyeing, cutting, sewing, ironing, and other repairing and upgrading operations
- Energy and water
- A collection and delivery system including delivery points and channels
- Workshops for repairing and upgrading
- Guides and kits for self-repairing and upgrading
- Offline and online service infrastructure (websites, social media, apps, and workshops)
- Office equipment
- Investment capital



Customer Relationships

- Brands&retailers:**
 - More trustful, longer-lasting, and continuous relationships with consumers
 - Communication with consumers regarding guidelines for repairing and upgrading
 - An opportunity to get feedback from consumers about weaknesses and most needed repairs
- Service providers:**
 - Possibility to create long-term relationships with consumers, through creative and good work
 - Long-term relationships with businesses as a service provider and value chain supplier
- Business-to-business commercial relationships and offline/online points of sale provide opportunities to create CE-related relationships with customers

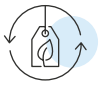
Channels

- For consumers:**
 - Collection and delivery: points of sale, repair points, through couriers
 - Repair and sale of spare parts: repair points, repair service providers
 - Communication: websites, apps, social media, email, phone calls
- For businesses:**
 - Collection and delivery: through couriers
 - Communication: websites, social media, email, phone calls



Customer Segments

- Consumers willing to use garments and accessories for longer by repairing and upgrading
- Consumers looking for repairing and upgrading services for their existing defective or unwanted garments and accessories
- Brands, retailers, and second-hand and rental companies willing to outsource repairing and upgrading services



Cost Structure

There are possible cost items associated with design, investment, and operation/sustainability:

- Human resources
- Purchase of materials (fabrics, leather, yarn, etc.) and spare parts (zips, buttons, etc.) for repairing/upgrading
- Purchase and setting up of equipment and machines for repairing/upgrading
- Production of repair kits and necessary parts for repairing and upgrading
- Service providers for repairing and upgrading (applicable to brands&retailers)
- Rental or acquisition of physical infrastructure (workshops, repair points) and office material
- Repairing and upgrading operational costs (energy, water, maintenance, etc.)
- Collection and delivery costs
- Development and maintenance of service and communication activities



Revenue Streams

There are revenue streams associated with sales and repairing/upgrading services:

Brands&retailers: selling repairable/upgradable products and spare parts as well as repairing/upgrading services to consumers

Service providers: selling repairing/upgrading services to consumers, retailers, brands, and second-hand and rental companies

For brands&retailers, the feasibility of this model depends on the balance between production and repairing costs and pricing. In general, the market and demand for long-lasting, repairable/upgradable products as well as the consumers' approach to repairs are quite determinant. The spread of slow fashion principles is expected to promote this business model as well

Potential Impacts



Economic

- Increase in demand for durable, long-lasting, and high-quality materials
- Expansion of the sustainable garment and accessories market
- Value and savings created through reduced production and use of virgin materials
- Expansion of the garment and accessories repair, upgrading, and maintenance industries
- Promotion of the resale and rental sectors
- Reduction in costs associated with landfilling and incinerating end-of-life products



Environmental

- Reduction in the overall environmental impacts stemming from the extraction and processing of raw materials and from waste management of end-of-life products
- Reduction in the amount of garment and accessories waste landfilled or incinerated
- Improvement in the eco-design and sustainability perspective at both company and value chain levels



Social

- Safer and cleaner environment for the community
- Job creation and increase in the demand for circular fashion designers
- Job creation in repair, maintenance and upgrading industries
- Economic advantages for consumers obtained by using products for longer times
- Raised awareness of consumers for the value of repairing and upgrading

Relevance to Other Circular Economy Strategies and Business Models

- **Repairing and upgrading** is linked with **design for durability, longevity, and modularity**, another business model for this same strategy. Repair and upgrading opportunities and relevant services help products last longer and be more durable. Modularity facilitates repair and upgrading practices.
- The resale and rental markets need durable, repairable products and regular maintenance and repair services. Therefore, this business model supports **reselling**, another model for this strategy, as well as supporting the four strategy and its business model, associated with **renting and leasing**.

Replicability in the South Mediterranean

Garment repair services are quite common in the South Mediterranean countries. Although that is generally due to economic reasons in most of the countries, the potential is still high for expansion and development as a circular business model. On the other hand, since big brands and

retailers haven't yet included this service in what they offer, small designers might enjoy a great opportunity to expand their services and create stronger relationships with their clients.

Opportunities and Challenges for Businesses

As the level and quality of repairing services improve and consumers become more aware of global sustainability efforts, such services may be embraced by larger groups of people in the region. Garment repair and upgrading businesses can also expand alongside garment rental and second-hand businesses, thanks to the growing interest of younger people in sustainable fashion and to the recovery of long-held repairing practices from older generations.

Opportunities and Drivers for Businesses

- Growing garment resale and rental businesses, for which repair and maintenance services is key
- Traditions supporting the extending the life of clothes through repair
- Cost savings that repairing provides for consumers
- Existing tailoring capabilities which can be used for repairing and upgrading
- Relatively low investment costs required
- Possibility of young people mirroring the global transition towards responsible fashion consumption
- Business creation opportunities due to the increasing demand for eco-design and tailoring expertise
- Opportunity to improve company competitiveness and reputation through repairable/upgradable products
- Opportunity to improve company's capacity for eco-design and facilitate the implementation of other circularity strategies

Challenges and Barriers for Businesses

- Immature local markets and demand for repairable/upgradable products
- Existing negative mindset about wearing repaired garments
- Dominance of fast fashion practices, such as low-quality garments
- Limited government support for such businesses
- Investment needed especially for new equipment and workshop
- The need to improve the quality and creativity of existing repairing and tailoring capabilities
- Challenges in collecting products to be repaired and then returning them
- Challenges in communicating the value and benefits of repairing and upgrading

Opportunities and Challenges for Consumers

Repairable/upgradable products and relevant services let consumers use their garments and accessories for longer and more efficiently. Consumers have the opportunity to extend the life of their goods, and thereby develop trust in and attachment to them. They can create a long-term relationship with the producer/seller and have the opportunity to save money in the long run, in addition to the satisfaction of revitalizing defective or unwanted products.

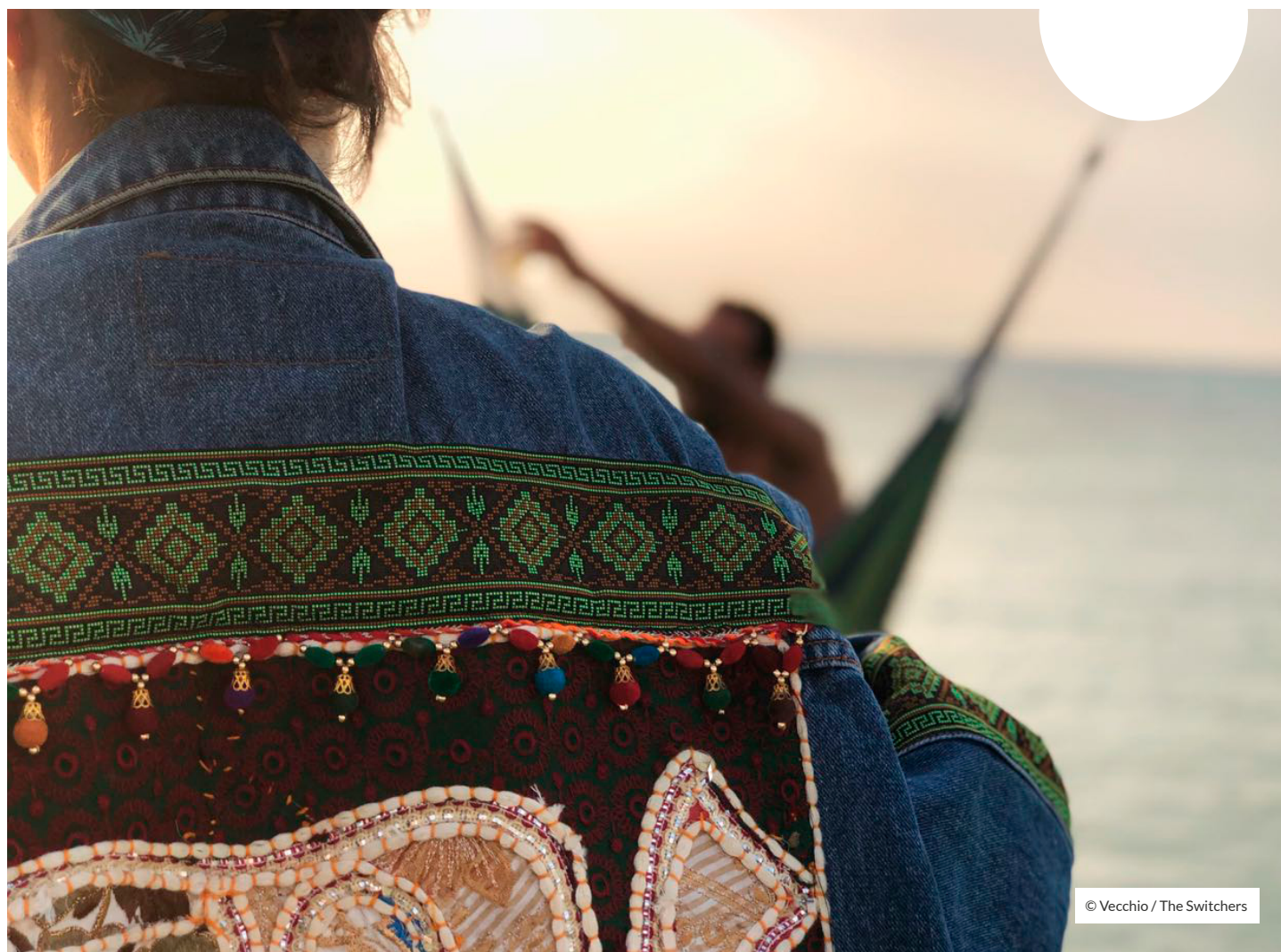
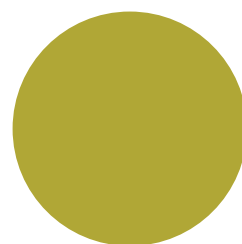
However, it may be a challenge for consumers to appreciate the advantages of lifespan extension over buying a new garment. They may also have a hard time accessing such services and getting satisfactory results.

[Check out some case studies here.](#)

Reselling

Reselling is one of the most popular and well-known ways of promoting reuse and reducing disposal. It mainly refers to selling and buying second-hand garments and accessories. In the fashion industry, reselling is already widely adopted all over the world. In 2019, the resale market had grown 21 times faster than the retail market over the five preceding years. In 2018, 56 million women bought second-hand products, up from 44 million in 2017 (thredUP, 2020).

As a business model, reselling appeals to businesses of different sizes, from big retailers to small retailers, from seed-stage investors to large buyout firms. Second-hand shops have existed in many countries for many years. Today this model generally functions as an online platform where users can buy and sell second-hand garments and accessories. These items can be sold through the platform for either credit or money. The platform's owners are responsible for managing the system and ensuring that the items sold on the platform are in good condition and meet the relevant criteria. Reselling opportunities encourage consumers to take good care of their garments and accessories so they can retain as much of their value as possible.



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Key Partners / Stakeholders

- Garment and accessories providers: consumers/customers, municipalities and NGOs collecting used products, post-consumer waste collectors and recyclers, brands&retailers that provide their second-hand products
- Online platform and technology suppliers and maintenance service providers
- Suppliers that check, repair, clean, and maintain garments and accessories
- Logistics suppliers that provide storage, transportation, and packaging
- Communications and branding partners
- Insurance and legal services partners
- Customers that provide feedback and comments
- Employees
- Banks, investors, and other organizations that provide access to funding
- Citizens that benefit from sustainable practices



Key Activities

- Identifying the model details, i.e. selling/buying terms, and a credit system (if applicable)
- Establishing the technological infrastructure and a digital platform, and continuous maintenance thereof, and tracking an and/or establishing an offline store (if applicable) for second-hand garments and accessories
- Engaging with brands, retailers, and other sources to create and regularly update an inventory of second-hand garments and accessories
- Setting up the infrastructure for logistics (storage, packaging, and transportation)
- Managing demand, inventory and deliveries
- Establishing a system for quality checking, maintenance, cleaning, tagging, registration, and repair activities for the garments and accessories
- Developing an effective collection and distribution scheme
- Managing agreements and other legal relationships (warranty procedures, brand approvals, etc.) with the customers and providers of garments and accessories
- Communication and marketing activities with special focus on the advantages of the second-hand clothing markets



Value Propositions

- Provide consumers with the opportunity to buy and sell second-hand fashion products, reducing their environmental footprint and benefitting them economically
- Provide brands&retailers with the opportunity and infrastructure to create and implement a second-hand market for their garments and accessories

Key Resources

- Human resources
- Online platforms and technological infrastructure (websites, apps, and social media capabilities) or offline shops
- An inventory of garments and accessories (stock)
- Offline shops (if applicable), storage, and other logistics infrastructure
- Office equipment
- Investment capital



Customer Relationships

- Long-term and strong relationships with consumers through selling/buying options and credit systems
- Trust and attachment generated through an attractive inventory and intense cleaning and maintenance services
- Opportunity to share experiences and interact through an online platform
- Business-to-business commercial relationships and offline/online points of sale provide opportunities to create CE-related relationships with customers
- Long-term and strong partnerships with brands&retailers

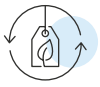
Channels

- Sales: websites, apps, shops, markets
- Communication: websites, social media



Customer Segments

- Consumers that want garments and accessories at low cost (generally high-quality—luxury, premium—pieces)
- Consumers willing to sell their used garments and accessories which are in good condition
- Consumers who consciously choose second-hand as a way of decreasing their environmental footprints
- Brands looking for a second-hand market for their products (generally luxury, premium products)
- Rental businesses seeking second-hand garments and accessories for their inventory



Cost Structure

There are possible cost items associated with establishment, operation, and communication:

- Human resources
- Purchase of garments and accessories for creating and updating stock
- Investment capital and supplier costs for digital infrastructure and an online platform, including maintenance and management
- Rental or acquisition of physical infrastructure (storage, office space, and physical shops (if applicable))
- Supplier costs for clothes cleaning, repairing, and maintenance
- Transportation, distribution, and other logistics costs
- Development and maintenance of transactions and communication activities



Revenue Streams

There are revenue streams associated with sales through online and offline shops and service fees from brands & retailers which use the infrastructure for reselling of their products (if applicable):

This business model is generally feasible based on the relatively low investment costs and the increased interest in consumers for second-hand in the fashion industry. It is still critical to assess the demand and habits of the community, as well as to build up attractive inventory, supported by reliable infrastructure. Online systems work better for this model. Businesses currently conducting online sales and rental/leasing activities have the option of adding reselling to their systems

Potential Impacts



Economic

- Expansion of the garment and accessories second-hand and rental/leasing markets, including associated services
- Expansion of the garment and accessories e-business market
- Value extension through reuse and the associated repair/maintenance activities
- Value creation with the opportunity of reselling pieces which are sorted from the post-consumer waste collected for recycling
- Reduced costs at the value chain level (waste management, raw materials usage, manufacturing)
- Garment production cost reduction by limiting overproducing



Environmental

- Reduced pressure on virgin resources
- Reduction in garment waste generation and landfill/incineration diversion
- Reduction in overall environmental impacts through the limited production of new items (water, GHG, chemicals, energy, waste, etc.)
- Reduction in the overall environmental impacts stemming from the management of garment and accessories waste



Social

- A safer and cleaner environment for the community
- Job creation in second-hand, collection, maintenance, and repair operations
- Job creation in the e-business sector
- Economic advantages for consumers through lower-priced products and the ability to sell their used products
- Promotion of donating used products
- Consumers encouraged to reduce their purchases of new products and to better take care of their products during the use phase
- Raising consumer awareness of sustainable shopping and the value of reusing

Relevance to Other Circular Economy Strategies and Business Models

- **Reselling** requires relatively durable and high-quality products, considering the long-term use and the increased need for cleaning. Hence, it makes space for **designing for durability and longevity**. Reselling also generally requires the **repairing and upgrading** of used products before they can be re-marketed.
- Additionally, this model facilitates collecting used products, and in this respect, is closely related and complementary to the **collection and recycling** business model. From another perspective, wearable products sorted from collected post-consumer waste represent a source for second-hand markets.
- Reselling and rental/leasing businesses can be executed together and in coordination with each other. Therefore, the **reselling** model cross-cuts the fourth strategy and its business model, which aim at **increasing resource utilization rate**.

Replicability in the South Mediterranean

There are many second-hand shops and markets of different sizes in the South Mediterranean countries, including online shops. The most popular ones sell garments and accessories from Europe, especially luxury products. The younger generations are particularly interested in these products and shops. Although normally people prefer to buy new clothes, in many of these countries people generally buy second-hand garments since they cannot afford new ones.

The environmental and sustainability aspects of reselling have recently become a topic of discussion in some of these countries. The number of online shops that let users both buy and sell second-hand garments and accessories is increasing, at different rates depending on the country, especially for high-quality and “like-new” items. Such businesses generally sell both new and second-hand garments on the same platform.

Opportunities and Challenges for Businesses

This business model has the potential to spread in the South Mediterranean, based on existing practices and examples. As the mindset about “second-hand products” changes and becomes more associated with sustainability, the resale market will grow in line with global trends. Existing online sale businesses have the option of incorporating this into their model as well.

Opportunities and Drivers for Businesses

- Fast growth of the resale market across the world
- Increase in consumers' demand for high-quality and low-cost products
- Possibility of young people mirroring the global transition towards responsible fashion consumption
- Relatively low investment costs and technology infrastructure need
- More affordable options for consumers and the opportunity to sell their used clothes, within the context of today's economic limitations
- Experience and motivation provided by the existing examples and other similar businesses
- New markets and marketing opportunities for existing businesses like online sale and rental garments and accessories businesses
- Resiliency against rising material and production costs

Challenges and Barriers for Businesses

- Need to outsource activities such as logistics, clothing maintenance and cleaning, etc.
- Challenges in communicating the business model and obtaining consumer trust
- Challenge of reaching knowledgeable customers that are aware of the importance of reuse and sustainable shopping
- Necessary 'mind-set shift' and behavior change
- Risk of limiting product choice for consumers
- Insufficient regulatory incentives (e.g. EPR, subsidies, tax)
- Insufficient high-quality clothes and design for durability and longevity approaches

Opportunities and Challenges for Consumers

The basic opportunities for consumers associated with resale include access to affordable, high-quality garments and accessories and in certain online cases, gaining revenue or credits from selling their own used products. Resale helps consumers to understand the value of reusing and to adopt more sustainable forms of shopping and living.

On the other hand, consumers need to change their habits, consumption patterns, and mindset regarding wearing second-hand. They need to trust in the quality and cleanliness of the products they buy. It may also be challenging for them to learn and perceive how online shopping with a credit system works, if applicable.

[Check out some case studies here.](#)

Strategy 4 : Increase Resource Utilization Rate

This strategy is essentially linked with the use and maintenance stage and proposes focusing on functionality and use rather than product and ownership. The customer becomes more of a “user” of a service as opposed to a “consumer” of a product. The concept replaces personal attachment with product use and places control over consumption, reducing the dependency on natural resources while increasing product quality and longevity.

One essential strategy for selling functionality instead of ownership of products is servitization. Companies evolve from selling products towards “product as a service” models which provide functionality through a combined delivery of products and services. To implement servitization, firms must shift from product-oriented business models to use-oriented ones. Instead of striving to sell the maximum number of products, companies are motivated to make a profit by extending product lifetime and facilitating usage by multiple users. One tool often used for this strategy is shared use or shared ownership, often made possible through online platforms. A large and growing number of products and services are now shared by multiple users, often called the sharing economy or collaborative economy.

In the fashion industry, the business models implemented for increasing product utilisation rate are also based on sharing products. They include rental/leasing and subscription models, generally provided through online shops.

Relevant business model:

Rental/Leasing and Subscription

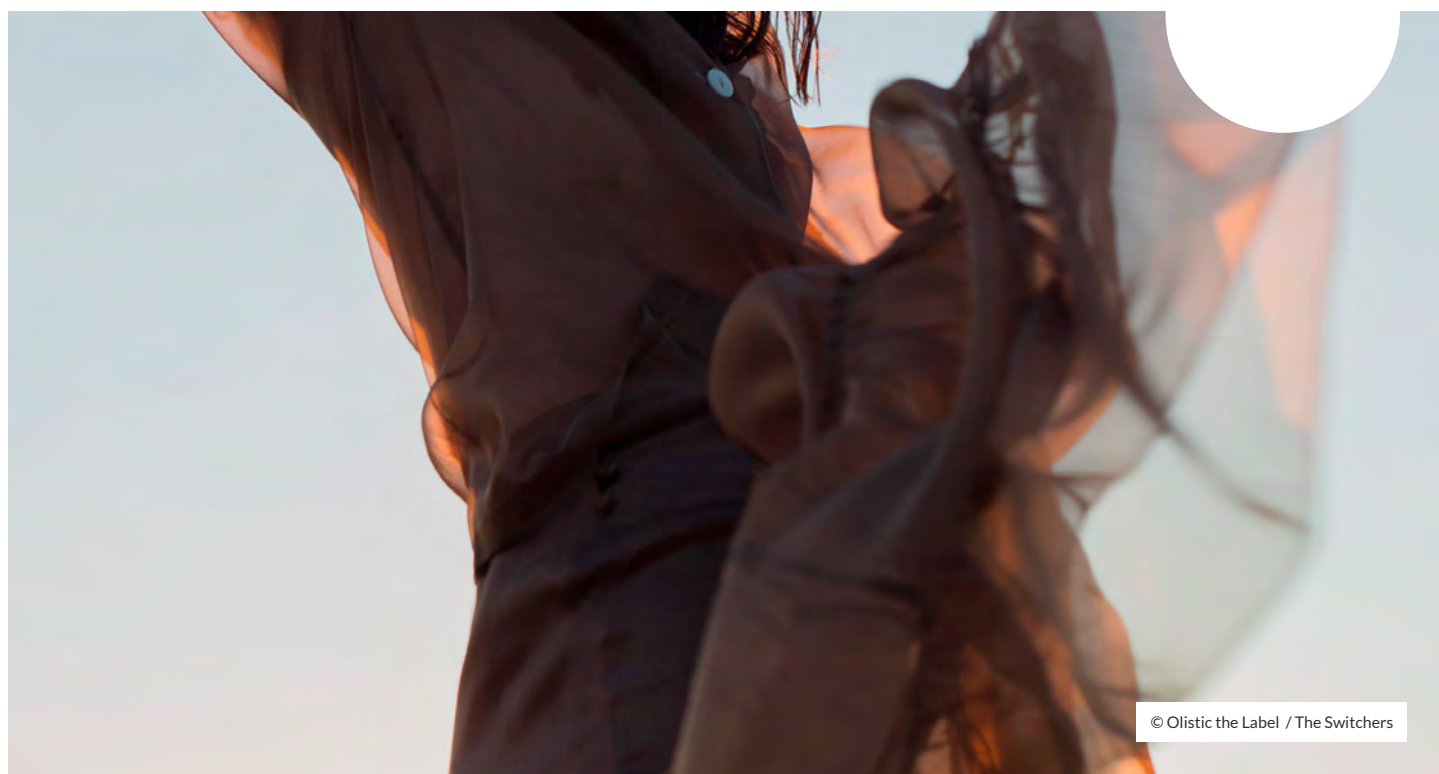
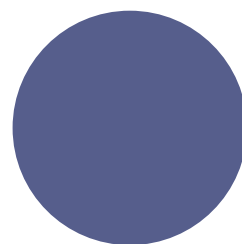


Rental/Leasing and Subscription

Rental/leasing, sometimes supported by subscription systems, is the main business model for implementing the fourth strategy in the fashion industry. In this model, the provider, who typically maintains ownership of the product, becomes responsible for all the maintenance and cleaning operations,

- **Rental:** Customers pay for the rights to access a product for a short period of time, typically less than 30 days.
- **Leasing:** Customers pay for contractual rights to use a product over a longer period of time. At the end of the contract period, they are generally given the option of owning the product or giving it back.
- **Subscription:** A commitment tool that charges customers a recurring fee—typically monthly or yearly—to access a product or products, mainly through a digital platform. There are different types of subscription options based on different time periods, prices, individual style, or consumer needs and expectations.

Garment and accessories rental services have recently attracted increased attention from major global companies as well. Many different online sharing platforms are offering high-quality brands or children's or maternity clothing, while a number of boutiques and shops provide rental or leasing options to their customers. Rental and leasing also help businesses and brands keep track of their products and facilitate their collection for when they become unwearable.



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Business Model Canvas



Key Partners / Stakeholders

- Garment and accessories providers: brands, retailers, boutiques, garment manufacturers, small producers, second-hand sellers, etc.
- Online platform and technology suppliers and maintenance service providers
- Suppliers that repair, clean, and maintain garments and accessories
- Logistics suppliers that provide storage, transportation, and packaging
- Communications and branding partners
- Insurance and legal services partners
- Customers that provide feedback and comments
- Banks, investors, and other organizations that provide access to funding
- Citizens that benefit from sustainable practices



Key Activities

- Identifying the details of the model, i.e. renting/leasing terms and the subscription system (if applicable)
- Establishing technological infrastructure and a digital platform and its continuous maintenance and tracking and/or establishing an offline store (if applicable)
- Engaging with brands, retailers, and other sources to build up a garment and accessories inventory and its continuous improvement
- Setting up the infrastructure for logistics (storage, packaging, and transportation)
- Managing demand, inventory, and deliveries
- Establishing a system for the regular maintenance, cleaning, tagging, registration, and repairing of garments and accessories
- Developing an effective distribution and take-back scheme
- Managing agreements and other legal relationships (warranty procedures, etc.) with customers
- Communication and marketing activities especially focused on the advantages of rental/leasing systems



Value Propositions

- Give consumers access to a shared wardrobe, reducing the environmental footprint of using fashion products
- Offer consumers the flexibility and convenience of wearing a variety of garments and accessories that can be used on different occasions, eliminating the need to purchase new items
- Provide brands&retailers with an infrastructure through which to rent out their garments and accessories
- Help brands keep track of their garments and accessories and collect them when they become unwearable, supporting their circularity strategies



Customer Relationships

- Long-term and strong relationships with consumers through subscriptions
- Trust and attachment generated through an attractive inventory and intense cleaning and maintenance services
- Opportunity to share experiences and interact through an online platform
- Business-to-business commercial relationships and offline/online points of sale provide opportunities to create CE-related relationships with customers
- Long-term and strong partnerships with brands&retailers



Customer Segments

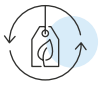
- Consumers wanting high-quality garments and accessories and unlimited wardrobes at a low cost
- More common for fast fashion wearers, millennials, young to middle-aged, from upper to middle class, or individuals that have temporarily/rapidly changed sizes
- Consumers who consciously choose renting as a way of decreasing their environmental footprints
- Brands willing to rent/lease their products (generally luxury, premium products)

Channels

- Sales: Website, app, shops
- Communication: websites, social media

Key Resources

- Human resources
- Online platforms and technological infrastructure (websites, apps, and social media capabilities)
- An inventory of garments and accessories (stock)
- Offline shops (if applicable), storage, and logistics infrastructure
- Office equipment
- Investment capital



Cost Structure

There are possible cost items associated with establishment, operation and communication:

- Human resources
- Purchase of garment and accessories for stock creation and improvement
- Investment capital and supplier costs for digital infrastructure and online platform including maintenance and management
- Rental or acquisition of physical infrastructure (storage area, office and physical shop (if applicable))
- Supplier costs for product cleaning, repair and maintenance
- Transportation, distribution and other logistics costs
- Development and maintenance of transactions and communication activities



Revenue Streams

There are revenue streams associated with renting/leasing fees, subscription/ membership fees, sales and services:

Subscription/Membership fees:

- One-time payment for a continuous access to garments and accessories for a certain period of time (generally annual)
- Subscription fee for becoming a member (then rental fees will be paid for each transaction)

Renting/Leasing fees:

- Pay per use payments for short time rentals (on the basis of transaction)
- Recurring payments for long term leasing (e.g. monthly payments)

Renting/Leasing fees:

- Product sales after renting/leasing period is ended, if preferred by the customer
- Service fees from brands&retailers for using the rental/leasing infrastructure

This business model is generally feasible based on the raising interest of consumers for renting/leasing in fashion industry. Relatively longer pay back periods and cashflow challenges should be taken into account. It is also critical to assess the demand, habits of the community, as well as creating an attractive inventory, supported with a trustworthy infrastructure. Online systems work better for this model. Businesses currently making online sales can add the rental/leasing option to their systems and grow it over time based on demand and reactions

Potential Impacts



Economic

- Expansion of the rental/leasing and second-hand markets, including associated services
- Expansion of the e-business market
- Value extension of garments through use by multiple users and the associated repair/maintenance activities
- Value creation with the opportunity to rent pieces that haven't been sold at the end of each season
- Reduced costs at the value chain level (waste management, raw materials usage, manufacturing)
- Production cost reduction by limiting overproducing



Environmental

- Reduced pressure on virgin resources
- Reduction in garment waste generation and landfill/incineration diversion
- Reduction in overall environmental impacts through the limited production of new items (water, GHG, chemicals, energy, waste, etc.)
- Reduction in the overall environmental impacts stemming from the management of garment and accessories waste



Social

- A safer and cleaner environment for the community
- Job creation in rental/leasing, maintenance, and repair operations
- Job creation in the e-business sector
- Lower-priced products for consumers and the ability to rent for special occasions instead of buying
- Consumers encouraged to stop purchasing unneeded clothes at such a rapid rate
- Raising consumer awareness of sustainable shopping and the value of sharing

Relevance to Other Circular Economy Strategies and Business Models

This strategy appears to be conducive to the synergistic application of multiple circular strategies. Renting/leasing models are often outlined as a potential enabler for configuring new business models for a circular economy, stimulating lifetime extension and product take-back.

- Firstly, it requires relatively durable and high-quality products, considering the long-term use and increase in cleaning, and thus supports **design for durability and longevity**, a business model for the third strategy.
- It also cross-cuts the **repairing, upgrading** and **reselling** models under the same strategy.
- Additionally, this model facilitates collecting used products and thus is closely related and complementary to **collection and recycling**, a business model for the second strategy.

Replicability in the South Mediterranean

Renting expensive fashion items for special occasions like weddings (bridal parties, wedding dresses, etc.) is a relatively popular form of consumption in the South Mediterranean countries, whereas subscription and leasing models are not common for fashion products. Ownership is still a strong norm and consumers are hesitant about alternative consumption. The proposed determinants of

this business model, which are “experience orientation”, “price consciousness”, and “environmentalism”, support non-ownership types of consumption, but motivation and adaptation will take time. With the increasing number of innovative businesses seen in the market in Turkey and southern Mediterranean countries, consumer behavior is expected to gradually shift in this direction.

Opportunities and Challenges for Businesses

The underutilization of garments presents a significant opportunity to capture value for businesses. This business model has the potential to spread in the South Mediterranean based on existing examples as well as the fact that it doesn't immediately require modifying product design, sourcing, production, or organizing new partnerships, and therefore the cost and time of implementation can be relatively limited. It is also possible for existing online sale and resale businesses to add this option into their model as well.

Opportunities and Drivers for Businesses

- Relatively low investment costs and technology infrastructure needs
- Increase in consumers' demand for dressing up for different occasions and changing needs
- Providing a more affordable option for consumers within the context of economic limitations
- Safeguard market share with a unique offering and increased competitive advantage enabling consumers to pay only for the functionality they need
- Experience and motivation provided by existing examples and other similar businesses
- New markets and marketing opportunities for existing businesses, like online sale and resale businesses
- Additional revenue generated by renting fees for existing businesses like online sale and resale businesses
- Resiliency to volatile markets

Challenges and Barriers for Businesses

- Need to extensively outsource activities such as logistics, maintenance, cleaning, etc.
- Challenges in communicating the business model and obtaining consumer trust
- Challenge of reaching knowledgeable customers that are aware of the importance of sharing and sustainable shopping
- Required 'mind-set shift' and behavior change
- Dependency on brands and retailers to create and update inventory
- Risk of limiting product choice for consumers
- Increased risks and costs associated with extending responsibility beyond the point of sale
- The relatively large initial investment needed to buy garments and accessories
- Cashflow challenges where payments are completed after leasing period ends
- Insufficient regulatory incentives (e.g. EPR, subsidies, tax)
- Insufficient design for durability and design for repair approaches

Opportunities and Challenges for Consumers

The basic opportunities for consumers associated with rental/leasing include access to affordable, high-quality garments and accessories as well as responsiveness to rapidly changing situations such as size, age, trends, etc. Thus, consumers pay only for the use they make of the product, which is much cheaper than buying; and it is much easier for them to meet their specific needs and desires. Renting and leasing help consumers to understand the value of sharing and to adopt more sustainable forms of shopping and living.

On the other hand, consumers would need to change their habits and consumption patterns. Renting and leasing actually limits behavioral freedom and personal attachment. It may also be challenging for consumers to learn and perceive how the system works.

[Check out some case studies here.](#)

Strategy 5 :

Shift to Circular Supplies and Renewable Resources

This strategy aims at shifting from finite resources and energy to renewable resources and energy, respecting natural regeneration cycles. It concerns not just the raw material extraction stage but all other life cycle stages of a product/service. The objective is to utilize renewable energies as well as bio-based and locally and fully recyclable materials in closed loops, at every stage of a product/service life cycle. Closing the loops starts with using recyclable and circular supplies, but it also covers the use and maintenance stages. Controlling the entire value chain including suppliers as well as ensuring traceability is quite critical for efficient and safe circularity. Fully achieving that is closely related to a design stage that focuses on biological (bio-based/organic) and technical (inorganic) cycles.

The fashion industry uses both natural bio-based materials such as cotton, linen, viscose, and leather and plastic-based inorganic materials. Therefore, both biological and technical cycles should be taken into account when shifting to circular supplies and value chains. This strategy is mainly associated with two main approaches in the fashion industry: one uses circular and eco-friendly fibers and other input materials such as cotton, linen, viscose. Or recycled/recyclable inorganic materials so that circularity can be achieved at the value chain level; and the other one exerts full control over the value chains through eco-design and slow fashion perception.

Relevant business models:

Value chains driven by alternative, low-impact fibers or recycled materials

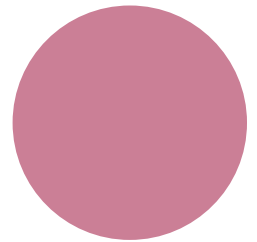
Slow fashion in full control of the value chains



Value Chains Driven by Alternative, Low-impact Fibers or Recycled Materials

This business model focuses on the inputs and their impacts on the circularity of value chains. The eventual goal is to achieve full recyclability and biodegradability of the materials flowing and being transformed throughout the value chain. Since textile and leather value chains include both bio-based and inorganic materials, the circularity of both types of materials and their impacts should be considered. This approach includes targeting unblended materials and cycles which are fully traceable and enable closed loops. Using certified organic cotton, recycled/recyclable cotton and polyester, and non-hazardous/bio-based dyes and finishes as well as other sustainable and natural fibers such as linen, bamboo, hemp, viscose, etc. are some of the ways this business model can be applied in the fashion industry. Organic, non-hazardous, and recycled material certifications, such as Global Organic Cotton Standard (GOTS), Global Recycled Standard (GRS), Oeko-Tex Standard 100, etc., play a critical role in ensuring traceability and safe circularity (biodegradability/recyclability). For traditional leather, in which animal skin is tanned chemically, there are also sustainable alternatives such as vegetable-tanned leather stemming from animals and bio-sourced leather-like materials made from mushrooms, rubber trees, algae, pineapple, etc.

This business model is applicable primarily to yarn, fabric, garment and accessories producers. It is possible both to start a new business with this model and to apply it to an existing business, for all products or just specific collections.



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Key Partners / Stakeholders

- Suppliers of circular inputs and materials, such as organic cotton, linen, bamboo, recycled cotton and polyester, and non-hazardous/bio-based dyes and finishes
- Equipment and machinery suppliers for garment and accessories manufacturing
- Designers and consultants, R&D centers, and universities for eco-design support
- Employees
- Customers: individual consumers, garment producers, and brands&retailers
- Certification organizations that approve a product's compliance with relevant standards
- Banks, investors, and other organizations that provide access to funding
- Public organizations: municipal, regional, and national governments that implement measures to encourage businesses
- Citizens that benefit from sustainable practices



Key Activities

- Analyzing current supply/value chains and customer expectations to identify circular input requirements and opportunities for ensuring circular value chains
- Sourcing alternative raw materials and inputs and doing supplier checks to ensure product and material certification
- Designing, conducting R&D on, and testing the new products based on the new alternative inputs
- Getting feedback from potential customers
- Purchasing (new) equipment and tools suitable for processing the new inputs and applying new garment and accessories manufacturing methods if required
- Setting up the infrastructure to manufacture and sell fabric and/or garments and accessories
- Garment and accessories manufacturing processes (dyeing, cutting, sewing, and ironing)
- Identifying applicable standards, completing required product certification procedures, and getting certified
- Sales and distribution activities especially relevant to the communication of circular and sustainable inputs and products
- Communicating with consumers, suppliers, public institutions, NGOs, and other stakeholders



Value Propositions

- Provide consumers with garments and accessories that are fully biodegradable/ recyclable, thus reducing the environmental footprint of purchasing and using garments and accessories
- Provide brands&retailers and garment producers with traceable fabrics or garments and accessories made of circular/sustainable materials, thus supporting them in closing the loops in the value chains of their products

Key Resources

- Human resources
- Strong eco-design capabilities and material expertise
- Circular, natural, and sustainable inputs and materials such as organic cotton, linen, bamboo, recycled cotton and polyester, and non-hazardous/bio-based dyes and finishes
- Machinery and equipment for dyeing, cutting, sewing, and ironing
- Energy and water
- Vehicles for distributing clothes
- Premises (factories and workshops)
- Offline and online sales infrastructure (websites, social media, apps, and physical shops)
- Office equipment
- Investment capital



Customer Relationships

- Relationships with conscious consumers that are more trustful and longer-lasting
- Stronger relationships with and greater commitment between brands&retailers and their manufacturers
- Trust generated by providing material and product certifications and standards
- Business-to-business commercial relationships and offline/online points of sale provide opportunities to create CE-related relationships with customers

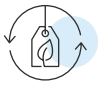
Channels

- For consumers:**
 - Points of sale: websites, apps, shops
 - Communication: websites, social media, email
- For businesses:**
 - Points of sale: fairs, e-business portals
 - Communication: websites, email, phone calls



Customer Segments

- Consumers interested in purchasing garments and accessories made of circular and renewable and recyclable inputs
- Brands, retailers, and garment and accessories producers seeking traceable, circular/ sustainable inputs, materials and products for closing the loops in their products' value chains



Cost Structure

There are possible cost items associated with eco-design practices, production, and communication:

- Human resources
- External experts and designers for eco-design and R&D
- Costs related to trials and tests of new products
- Certification costs
- Purchase of circular materials and inputs such as fibers, yarns, fabrics, finishes, dyes, etc. and other components
- Purchase and setting up of equipment and tools for manufacturing
- Rental or acquisition of physical infrastructure (shops, workshops, factories) and office material
- Transportation and distribution costs
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with sales:

- For designers and small brands: revenue from selling to individual consumers
- For manufacturers: revenue from selling to garment producers and brands&retailers

Feasibility and pay-back periods depend on the availability and cost of new inputs that support circularity, the extent of the additional investments required, and the relevant markets that can be reached

Potential Impacts



Economic

- Increase in demand for sustainable inputs and materials
- Expansion of the sustainable garment and accessories market
- Value and savings created through recycled materials and the elimination of virgin materials
- Reduction in costs associated with landfilling and incinerating end-of-life products



Environmental

- Reduction in the overall environmental impacts stemming from the extraction, processing, and waste management of non-recyclable/ biodegradable materials/ products
- Reduction in the amount of garment and accessories waste landfilled or incinerated
- Improvement in the circularity and sustainability perspective at both company and value chain levels



Social

- A safer and cleaner environment for the community
- Job creation and an increase in the demand for sustainable fashion designers
- Job creation in sustainable and circular materials and products
- Raised consumer awareness of circular products

Relevance to Other Circular Economy Strategies and Business Models

- It is linked with **slow fashion in full control of the value chains**, another business model for this same strategy, since input materials are key for the circularity of the whole value chain.
- It also goes hand in hand with the second strategy, **recovering resources after disposal**, since using recyclable materials and recycling activities promote the use of recycled and circular supplies.
- Since circular inputs require eliminating hazardous chemicals from products and production, this business model is linked with the first business model, **cleaner and resource efficient production & zero-waste production**.

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Replicability in the South Mediterranean

A value chain driven by alternative, low-impact fibers or recycled material is not a common business model in the South Mediterranean, despite the existence of several small-scale initiatives and designers. This is mainly because the local market and demand for circular garments and materials have yet to grow. On the other hand, global brands' targets and expectations related to the use

of circular inputs will stimulate the relevant facilities, especially in Egypt, Morocco, and Turkey where brands have a number of suppliers and production facilities. Example initiatives include UNIDO projects aiming at promoting certified and recycled cotton production in Egypt and certification incentives provided by the Moroccan government for the textile industry.

Opportunities and Challenges for Businesses

Raw material providers and producers in these countries can shift focus to circular inputs based on the increased export potential and circularity targets of global brands. For local markets on the other hand, it seems this approach will need more time to develop, which could happen in parallel with raised consumer awareness and incentives from governments.

Opportunities and Drivers for Businesses

- Sustainability and circularity targets of global brands purchasing from and/or manufacturing in the region
- Existence of natural, biodegradable materials, particularly in Turkey (cotton and hemp), Egypt (cotton), and Algeria (hemp)
- International and national programs supporting certified and recycled materials
- Business creation opportunities due to increased demand for expertise and consultancy for circular design
- Opportunity to improve company competitiveness and reputation through circular and sustainable products
- Opportunity to improve company's capacity for eco-design and make way for the implementation of other circularity strategies

Challenges and Barriers for Businesses

- Immature local markets and demand for sustainable materials and products
- Suppliers' limited ability to provide sustainable/certified inputs
- Higher prices for sustainable/certified inputs
- Insufficient human resource for R&D and eco-design
- Limited support from government for such circular businesses
- Investment needed especially for new equipment and technologies
- Challenges in communicating the value and benefits of circular inputs and value chains

Opportunities and Challenges for Consumers

Circular, low-impact inputs provide consumers with more sustainable garments and accessories. As natural materials are primarily used, and hazardous chemicals are eliminated from the inputs, consumers will be using safer and healthier products.

On the other hand, it is a challenge for consumers to differentiate circular garments and accessories from others and find the right purchasing channels. Besides, in some cases, they may encounter relatively higher prices for such products due to the higher prices of input materials and improved production processes.

[Check out some case studies here.](#)

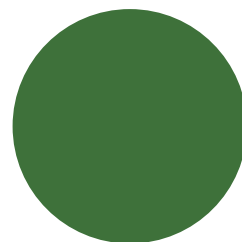
Slow Fashion in Full Control of the Value Chains

This business model is directly linked with the previous model, which mainly focuses on sustainable, renewable, and circular input materials for enabling the circularity of the value chain. This model, however, takes a wider approach and has full control of the entire value chain to ensure its sustainability and circularity.

The slow fashion approach is a response to the dominance of fast fashion and aims mainly at designing and producing sustainable, functional, durable, yet stylish garments and accessories that consumers would trust and get attached to. This is done by applying eco-design measures at every life cycle stage of a product and is generally characterized by the following features:

- High-quality, non-hazardous, sustainable materials.
- Locally sourced and produced products.
- Small batches of stylish and timeless collections released two to three times a year.
- Products sold locally, generally in relatively small shops.
- Sustainable supply chains.
- Production based on confirmed orders for efficient manufacturing and allocation of resources.

Businesses following this model generally develop their own input materials starting from extraction and/or cultivation. Alternatively, they can create a supply chain that is closely controlled and continuously supported. In addition, such businesses take into account the post-production phases and extend their responsibility accordingly to achieve a fully controlled value chain in line with the principles of life cycle and slow fashion approaches.



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Key Partners / Stakeholders

- Designers and consultants, R&D centers, and universities for eco-design support
- Suppliers of circular inputs and materials such as organic cotton, linen, bamboo, recycled cotton and polyester, and non-hazardous/bio-based dyes and finishes
- Equipment and machinery suppliers for garment and accessories manufacturing
- Suppliers that distribute and sell garments and accessories
- Employees
- Customers: individual consumers and brands and boutiques
- **Certification organizations that approve a product's compliance with relevant standards**
- Banks, investors, and other organizations that provide access to funding
- Public organizations: municipal, regional, and national governments that implement measures to encourage businesses
- Local stakeholders that take part in the value chain
- Citizens that benefit from sustainable practices



Key Activities

- Identifying eco-design features and critical aspects of supply and value chains according to slow fashion criteria
- Identifying suitable raw materials and inputs and production methods and designing post-product phases
- Extracting and producing circular materials or creating a reliable supply chain
- Doing supplier checks and audits to ensure product and material certification, and supporting and closely cooperating with them
- Conducting eco-design, R&D and product testing on the products obtained and getting feedback from potential customers
- Purchasing suitable equipment and tools that can process the selected inputs and applying the suitable garment and accessories manufacturing methods
- Setting up the infrastructure to manufacture and sell garments and accessories
- Garment and accessories manufacturing processes (dyeing, cutting, sewing, and ironing)
- Identifying applicable standards, completing required product certification procedures, and getting certified
- Sales and distribution activities especially relevant to the communication of slow fashion and eco-designed products
- Communicating with consumers, suppliers, public institutions, NGOs, local networks, and other stakeholders



Value Propositions

- Provide consumers with slow fashion products that are eco-designed, reducing the environmental footprint of purchasing and using garments and accessories
- Provide brands and boutiques with slow fashion products that are eco-designed, thus supporting them in closing the loops in the value chains of their products

Key Resources

- Human resources
- Strong eco-design capabilities and material expertise
- Sustainable raw materials and inputs, such as organic cotton, linen, bamboo, recycled cotton and polyester, and non-hazardous/bio-based dyes and finishes, that can be developed in-house or otherwise fully traced
- Machinery and equipment for dyeing, cutting, sewing, and ironing
- Energy and water
- Vehicles for distributing products
- Premises (factories and workshops)
- Offline and online sales infrastructure (websites, social media, apps, physical shops)



Customer Relationships

- Relationships with conscious consumers that are more trustful and longer-lasting
- Potentially stronger relationships and greater commitments between brands and other sellers
- Strengthened relationships through providing material and product certifications and standards
- Business-to-business commercial relationships and offline/online points of sale provide opportunities to create CE-related relationships with customers customers

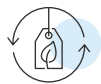
Channels

- For consumers:**
- Points of sale: websites, apps, shops (generally local small shops), markets
 - Communication: websites, social media, email, local networks
- For brands-businesses:**
- Points of sale: fairs, e-business portals
 - Communication: websites, email, phone calls, local networks



Customer Segments

- Consumers interested in slow fashion and eco-designed products
- Brands or boutiques willing to sell slow fashion and eco-designed products



Cost Structure

There are possible cost items associated with eco-design practices, production, and communication:

- Human resources
- External experts and designers for eco-design and R&D
- Costs related to trials and tests of new products
- Certification costs
- Supply chain management and support for suppliers
- Purchase and/or extraction/cultivation of materials and inputs such as fibers, yarns, fabrics, finishes, dyes, etc. and other components
- Production costs (energy, water, maintenance, etc.)
- Purchase and setting up of equipment and tools for manufacturing
- Rental or acquisition of physical infrastructure (shops, workshops, factories) and office material
- Transportation and distribution costs
- Development and maintenance of sales and communication activities



Revenue Streams

There are revenue streams associated with sales to individual consumers, brands, boutiques, and other sellers:

Feasibility and pay-back periods depend on the market and demand (especially local) for slow fashion and eco-designed products as well as the availability and cost of associated inputs, supplies, and services supporting circularity and government support

Potential Impacts



Economic

- Expansion of the eco-designed slow fashion market
- Increase in demand for sustainable inputs and materials
- Value and savings created through recycled materials and the elimination of virgin materials
- Reduction in costs associated with landfilling and incinerating end-of-life products



Environmental

- Reduction in the overall environmental impacts stemming from the extraction, processing, and waste management of unsustainable materials/products
- Reduction in environmental impacts across the whole life cycle
- Reduction in the amount of garment and accessories waste landfilled or incinerated
- Improvement in the circularity and sustainability perspective at both company and value chain levels



Social

- A safer and cleaner environment for the community
- Job creation and an increase in the demand for eco-designers
- Job creation in sustainable and circular materials and products
- Raised consumer awareness of slow fashion

Relevance to Other Circular Economy Strategies and Business Models

- As a business model, **slow fashion in full control of the value chains** is linked with **value chains driven by alternative, low-impact fibers or recycled materials**, with both working towards the same strategy, since input materials are key for the circularity of an entire value chain.
- It also goes hand in hand with the third strategy, **extending resource use and reducing disposal**, in that **designing for durability and longevity** form part of slow fashion and eco-design approaches.
- Since circular inputs require the elimination of hazardous chemicals from products and production, this business model is linked with the first one, **cleaner and resource-efficient production & zero-waste production**.

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Replicability in the South Mediterranean

Similarly to the previous business model, slow fashion in full control of the value chains is not common in the South Mediterranean, due to the local market composition and the weak demand for slow fashion and eco-design.

Fast fashion is quite dominant in the region and people generally prefer to buy new, low-cost products, with no concern for durability or sustainability.

Opportunities and Challenges for Businesses

Through international collaborations and support from governments and brands, relatively small businesses can be set up especially in countries that grow natural raw materials (Turkey and Egypt) and supply global brands that are setting more ambitious circularity targets by the day.

Opportunities and Drivers for Businesses

- Sustainability and circularity targets of global brands purchasing from and/or manufacturing in the region
- Existence of natural, biodegradable materials, particularly in Turkey (cotton and hemp), Egypt (cotton), and Algeria (hemp)
- International and national programs supporting certified materials
- Business creation opportunities due to increased demand for expertise and consultancy for eco-design
- Business creation and expansion opportunities in sustainable raw material growth or extraction
- Possibility of efficient manufacturing and allocation of resources with the help of a slow fashion approach
- Possibility of setting up businesses around locally sourced, produced, and sold products
- Opportunity to improve company competitiveness and reputation through slow fashion
- Opportunity to improve company's capacity for eco-design and pave the way for the implementation of other circularity strategies

Challenges and Barriers for Businesses

- Immature local markets and demand for slow fashion and eco-designed products
- Suppliers' limited ability to provide sustainable/certified inputs and services
- Higher prices for sustainable/certified inputs
- Challenges of tracking the whole value chain and ensuring traceability
- Insufficient human resource needed for R&D and eco-design
- Limited support from government for circular businesses
- Investment needed especially for equipment and technologies
- Challenges in communicating the value and benefits of slow fashion and eco-design

Opportunities and Challenges for Consumers

Slow fashion and eco-design approaches provide consumers with more durable, high-quality, and sustainable garments and accessories. As natural materials are primarily used and hazardous chemicals are eliminated from the inputs, consumers will be using safer and healthier products. This is a good way for consumers to adopt slow fashion and a sustainable way of life. They can access locally sourced and produced products that have slow fashion and eco-design features.

On the other hand, it is a challenge for consumers to find the right channels to purchase sustainable goods. Besides in some cases, they may encounter relatively higher prices for such products due to the higher prices of input materials and improved production processes.

[Check out some case studies here.](#)

Example Cases for Circular Business Models

Strategy 1 -
**Prevent Pollution
and Save Resources**

**Cleaner, Resource-Efficient,
and Zero-Waste Production**
Kilim Denim / Textil Santanderina

Strategy 2 -
**Recover Resources
After Disposal**

Design for Disassembly, Reassembly and Recycling
Rakha / Freitag

Collection and Recycling
I:CO (I:Collect) / Deniz Tekstil Grup

Upcycling
Elvis & Kresse / DYR

Strategy 3 -
**Extend Resource Use
and Reduce Disposal**

Design for Durability, Long Lasting, and Modularity
Flavialarocca / Houdini

Repairing and Upgrading
Houdini / E-terzi

Reselling
Thred Up / Tarz2

Strategy 4 -
**Increase Resource
Utilization Rate**

Rental/Leasing and Subscription
Ohlook / MUD Jeans

Strategy 5 -
**Shift to Circular
Supplies and
Renewable
Resources**

**Value Chains Driven by Alternative,
Low-impact Fibers or Recycled Materials**
Orta / Darwin's Botanicals

Slow Fashion with Full Control Over the Value Chains
Kilomet109 / One Square Meter

Strategy 1 - Prevent Pollution and Save Resources

Cleaner, Resource-Efficient, and Zero-Waste Production

Kilim Denim - Turkey

Kilim Denim was the first denim factory in Turkey, founded in 1953, and has been making fabric for over 60 years. The manufacturing plant is located in Edirne. Having turned to exports in addition to a domestic market in the last seven years, Kilim Denim has sold Turkish fabric all over the world in its years of experience. It produces fabric and finished garments and has an annual production capacity of 12 million meters of denim and 6 million meters of non-denim fabric. It has supplied several pioneering brands like G-Star, Hugo Boss, Jack & Jones, etc.

<http://kilimdenim.com/>¹¹

Resource-Efficient and Cleaner Production in Kilim Denim

Kilim Denim's approach to sustainability focuses on eco-friendly inputs and resource-efficient processes during fabric production. This influences their waste treatment, separation, and recycling practices as well as how they dye their fabric. Since 2015, Kilim Denim has taken several steps towards better production processes and more efficient resource use. Their primary motivations have been to increase productivity and cement their place among leading brands in sustainability, through global certification standards.

Improvements in yarn manufacturing and weaving machines

Kilim Denim modernized their yarn manufacturing and upgraded their weaving machines with an investment of 4 million EUR. New yarn manufacturing technology has enabled the manufacture of dual-core yarns, especially useful for stretch fabrics. New weaving machines have sped up the process of weaving denim fabric, increasing both the quality and diversity of fabrics produced, and all such improvements have significantly reduced resource consumption since 2015.

Improvements in indigo dyeing process

More recently, the indigo dyeing process of denim fabric has seen improvement. Previously, unfixed indigo dye that could not hold on to the warp was rinsed out during washing (overflow rinsing). This corresponded to 117 tons of water consumption and wastewater generated for one lot of indigo dyeing. Recently, Kilim Denim developed the Cactus technique in collaboration with Pulcra Chemicals to reduce water consumption by improving the overflow rinsing process. This technique uses a new chemical compound instead of a caustic bath before the first rinse and again during the first rinse after the dyeing process. This process helps all of the dye fix to the warp, no overflow rinsing is required, and water consumption drops to 8.4 tons per lot. Caustic consumption is fully eliminated and dye consumption is reduced as well. In addition to that, Kilim Denim has launched projects to eliminate hydrosulfide from the new generation of indigo dyes.

¹¹ All of the information contained in the present publication has been acquired through the company's official website and other public sources.

Beyond Process Innovation Towards Product Eco-design

Kilim Denim has recently developed and launched their special Re-create collection that includes all license-guaranteed pieces manufactured with organic cotton and cotton yarns recycled from used denim products (post-consumer jeans) that are GRS-certified (Global Recycle Standard). The jeans from this product line are made of 80% organic cotton, 10% cotton, and 10% post-consumer denim. Chemical finishes are not used in this collection. In addition, Kilim Denim has acquired a patent to use recycled plastic bottles from the oceans to make denim yarn and collaborated with G-Star to implement the Raw project and manufacture denim fabric from recycled polyester for their collections.

Impacts and Added Value

The cleaner production improvements Kilim Denim has made helped reduce operational costs as well as environmental impacts:

- Since 2015, improvements in yarn manufacturing and weaving machines have reduced electricity consumption by 40%, steam by 66%, fuel by 70%, and water by 65%.
- The recently developed indigo dyeing process has the potential to decrease the associated water consumption by 93% as well as caustic and dye consumptions.

For their Re-create collection, Kilim Denim uses recycled and recyclable materials, which diverts from landfills and reduces virgin material consumption. This also helps the demand for sustainable materials increase in the market.

Textil Santanderina – Spain

Textil Santanderina was established in 1923 in Cantabria, Spain, and has been manufacturing yarn and fabric since then. With its 320 employees, Textil Santanderina produces fabrics for fashion brands, industrial purposes, and protective clothing. It has a total capacity of about 20 million meters of fabric per year. Its products mainly include fabrics based on cotton and blends with linen and polyester as well as fabrics based on TENCEL™ and blends with linen and cotton. Approximately 65% of its product is exported to customers in Europe, the USA, and Asia. It works with suppliers from Spain and Europe as well as Turkey, Pakistan, and China.

<https://textilsantanderina.com/>

Resource-Efficient and Cleaner Production in Textil Santanderina

In its commitment to innovation and ecology, Textil Santanderina has focused on optimizing resources in production and using sustainable inputs like eco-friendly dyes and chemicals that meet REACH¹² criteria. They regularly carry out environmental audits to improve their processes and products from this perspective. The company's primary motivations are creating new products and markets, gaining reputation in the sustainable fabrics market, and cost reduction.

An integrated approach for water and energy efficiency

Especially during the last decade, Textil Santanderina has invested in energy reduction, water consumption minimization, and CO₂ emission reduction. As a part of such cleaner production practices, water and energy-efficient machines and equipment have been used and both production and administrative buildings have been renovated with elements such as automation systems and rainwater catchment, which significantly reduces water consumption.

Waste reduction and internal recycling

Through eco-efficient and cleaner production, Textil Santanderina has reduced waste generation and improved their management as well. They have focused particularly on recovering their yarn and fabric waste through the Internal Recycling Project. Internal recycling mainly covers the TENCEL™ and cotton yarns and fabric scraps generated during textile production processes such as spinning, weaving, and manufacturing. These scraps are ground up and turned into new fabrics again. Textil Santanderina cooperates with grinding companies to recycle their own waste. In addition to production waste, post-consumer garments discarded by their owners are also integrated into the recycling system because such materials are tracked at every step.



Use of eco-friendly chemicals and dyes

Textil Santanderina has developed eco-friendly dyeing and finishing methods using eco-friendly chemicals and dyes. These four methods are summarized below with the environmental benefits they provide during production.

¹² The EU regulation and standard for the Registration, Evaluation, Authorisation and Restriction of Chemicals.

	Ecolandye Ecological and efficient dyeing process, with new colors and wash effects	Vital Ecological and efficient dyeing process, compatible with all kinds of materials	Naturdye Innovative dyeing with colors obtained from natural colorants (leaves, nutshells)	Iris Environmentally friendly reactive dyeing process, with reactive colorants free of arylamine
Water/wastewater reduction (%)	20	92	20	50
Energy reduction (%)	40	40	40	50
Formaldehyde elimination (%)	100	-	100	-
Other specific benefits	-	-	100% of natural waste used in the dye	25% reduction in cycle time

A Wide Range of Certified, Eco-friendly Fabrics

Textil Santanderina's scrap recycling practices as well as eco-friendly dyeing and finishing processes contribute to its focus on producing a wide range of certified eco-friendly fabrics. They have produced a wide collection of fabrics based on organic and recycled fibers, complemented with new processes and the use of sustainable chemicals and dyes. They use organic cotton, recycled cotton, BCI cotton, TENCEL™, recycled polyester, etc. and eco-friendly dyes, all traceable in the supply chain.

Impacts and Added Value

Textil Santanderina has reduced its operational costs through cleaner production measures and increased its turnover with the help of sustainable fabrics. New eco-friendly products have given them the opportunity to open new markets.

Cleaner production measures, including internal scrap recycling, have saved resources and reduced associated environmental impacts, especially through the reduction of virgin raw material, water, and pesticides as well as CO₂ emissions. By using eco-friendly chemicals and dyes Textil Santanderina could save water by 20 to 92%, energy by 40 to 50%, and up to 100% of formaldehyde, based on the type of the chemicals and methods used.

For its eco-friendly collections, the company uses recycled and recyclable materials, diverting from landfills and reducing virgin material consumption. This also helps the demand for sustainable materials increase in the market.

Strategy 2 - Recover Resources After Disposal

Design for Disassembly, Reassembly, and Recycling

Rakha – UK

Rakha was first established in 2010 in Istanbul, Turkey, and launched its sister company in London in mid-2011. They claim responsibility for every garment they produce by focusing on the sustainability and natural degradation of materials. They produce contemporary and delicate garments for women who are design conscious and like to wear comfortable but stylish clothing year-round. Their target customer segment is 35 to 45-year-old women in the premium price segment of between 70 and 275 EUR. Gözde Taşkın, the founder of the brand, has continuously developed more sustainable business models for the company and its products. While Rakha's home market is the UK, they are reaching a considerable number of customers on the USA West Coast and in Northern Europe. They have also maintained a long-term relationship with their suppliers based mainly in Turkey but also Germany, Italy, and India.

<https://rakha.co.uk/>

Design for Recirculation with a Life Cycle Thinking Approach

Rakha's main focus is a life cycle thinking approach for product designs that enable circularity in every life cycle phase. The goal of the brand is to ensure that all products and components can be recirculated on an on-going basis without compromising design or aesthetics.

Rakha products are sold through its own physical and online shops as well as by several other sellers that have social and environmental priorities.



Biodegradable (naturally recyclable) materials

Rakha ideally aims to redirect every product into a biological cycle after its use. They ensure biodegradability to protect against consumers throwing their clothes away, considering that currently only 1% of clothing is recycled, and only 0.1% of this 1% is post-consumer waste at a global scale. In line with the aim, Rakha makes an effort to use only unblended materials to create its garments, ensuring that all of its products are either biodegradable or recyclable. Their materials include natural or recyclable/recycled fibers, such as organic cotton, linen, or poplin, as well as complementary components like wooden or seashell buttons, palm tree seeds, and organic prints. Products hold various certifications such as the GOTS, PETA Vegan and, GRS labels.

Circular design

For Rakha, it is important to implement circularity from the very beginning of a product's life cycle. So in addition to using circular materials and components, Rakha takes care to design for disassembly as part of its circular design principles. This includes using minimal components that are easy to separate as well as plain and simple designs.

Rakha has also recently collaborated with the University of Cambridge's Institute for Manufacturing on a project called In the Circle. The purpose is to identify and experiment with circular economy business model innovations that are relevant to each of Rakha's product segments. With a life cycle thinking approach, the project aims to enable circularity from conception and through every life cycle phase, through the design and development of a circular capsule collection that could be integrated in both biological and technical cycles.



Slow Fashion Approach

Rakha is for women who want to shop contemporary and premium collections but also prefer more sustainable products. Instead of following seasons and trends, the focus is on re-designing classic pieces, regarded as timeless, basic, and inspired by classic shapes. The pieces are generally casual and comfortable while conveying sophisticated style. Many of them are a guaranteed go-to for a variety of occasions and can effortlessly transition from day to night. Durable fabrics such as strong linen are used. In addition, production is based on confirmed orders for an efficient manufacturing process that allocates all their products to buyers.

Impacts and Added Value

Rakha has increased their turnover and in the last four years expanded their customer base in over 15 different countries. This growing business helps increase the demand for sustainable materials thanks to the 3.5 tons of organic and biodegradable textile materials Rakha uses per year.

That is 3.5 annual tons of non-renewable materials that are not extracted and processed, and thus, diverted from landfills and incineration. All environmental impacts associated with these processes are eliminated.

Rakha's In the Circle project has a social dimension as well, supporting Syrian refugee women in Turkey by allocating part of the project's production to the women via a charity organization. This provides them with support and helps them gain experience in the industry.

Freitag – Switzerland

Freitag was established in 1993 as a start-up in Zurich by two designers, Markus and Daniel Freitag. Inspired by the multi-colored heavy traffic that rumbled through the intersection in front of their Zurich flat, they developed a messenger bag out of used truck tarpaulins, discarded bicycle inner tubes, and car seat belts. This was how the Freitag brothers started their business. Their bags are well-known, but they have expanded their product range over time to include apparel for women and men as well as accessories. All garments they produce are made of natural materials and are biodegradable. Currently they produce 700,000 pieces per year and have around 250 employees. Freitag products are sold in 347 stores (Freitag shops and retailers) all over the world, mainly in Europe and Asia, in addition to their online store.

<https://www.freitag.ch/en/>

Design for Composting and Disassembly

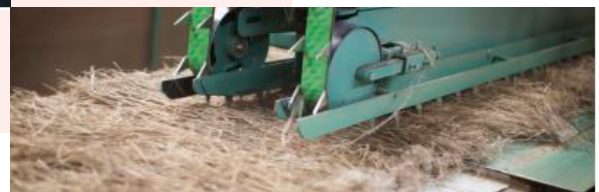
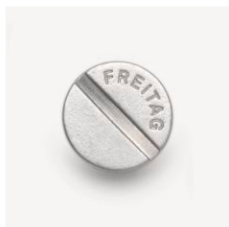
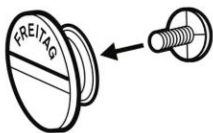
Natural fibers

In their search for suitable workwear fabric—made of tough, sustainably produced, and compostable materials—for their employees, the Freitag team decided to develop their own textiles from the fiber up that would fulfil 100% of their requirements. They called it F-ABRIC. F-ABRIC is made of bast fibers of linen, hemp, flax, and modal and is 100% compostable/biodegradable. The buttons for the F-ABRIC shirts are also made from natural materials, namely tagua nuts.

All the natural materials used are grown in Europe and do not require excessive amounts of water. As few chemicals as possible are used during cultivation (flax and hemp require almost no pesticides), meaning that F-ABRIC meets the class I standards of the Standard 100 by Oeko-Tex®¹³. Compared to common textile production processes, this journey from fiber to finished product is a short one, since all production stages take place within a 2,500 km radius of the factory in Zurich.

A design solution for non-biodegradable parts: the F-BUTTON

Using F-ABRIC denim, composed of 81% linen and 19% true hemp, Freitag has developed five-pocket jeans without using rivets or polyester thread. Like their other garments, Freitag's jeans use natural fibers and threads and are 100% compostable/biodegradable—except for the button. The Freitag team has made extensive efforts to find a biodegradable material befitting of raw material for a pants button, but have not been successful. So they settled for metal and invented a very simple button that can be used forever and ever. These metal buttons have a patented screw system and can be unscrewed by hand from one pant and screwed onto another. This makes it easy to separate the non-biodegradable metal part from the bio-degradable remainder, as well as to re-use the metal parts again and again.



¹³ STANDARD 100 by OEKO-TEX® is a globally standardized product label for textiles and accessories that have been tested for harmful substances. Class I products meet the strictest criteria, suitable enough for babies.

Upcycled Accessories

Freitag's flagship product is its bags, made from used truck tarpaulins, discarded bicycle inner tubes, and car seat belts. Each bag is durable, made of recycled material, and unique.

Their bags undergo a five-step production process:

- 1. Truck spotting:** this refers to the collection of tarps. Freitag employees called "truck spotters" source the best tarps from trucks, truckers, and shipping companies.
- 2. Tarp cutting:** the large tarps are cut into "recycled individual products" and freed of eyelets, straps, belts, and anything else that a Freitag bag doesn't need.
- 3. Washing:** washing transforms "used" into "patina" and "old" into "vintage" in addition to thoroughly cleaning the materials. Rainwater is used to wash the tarps, after which they are dried and bundled.
- 4. Bag design:** bag designers carve out the most beautiful and interesting designs possible from the tarps, ensuring that one-of-a-kind products are not just unique but uniquely beautiful as well.
- 5. Completion:** prototypes and test bags are sewn at Freitag's factory. The manufacturing is done by partners in Portugal, the Czech Republic, Bulgaria, Tunisia, and Switzerland.

Freitag also runs a swap system through its online website for those who want to exchange bags with each other.



Impacts and Added Value

Freitag has created a business from waste materials and expanded it significantly over the years, an important contribution to the sustainable products market. Economic value is created out of 800 annual tons of waste in lieu of virgin material. F-ABRIC production strengthens the organic and biodegradable materials and products market as well.

From an environmental perspective, water and chemical use is minimized in the cultivation of F-ABRIC fibers and their processing. Pesticide usage is almost eliminated. Used items do not go to landfills nor are they incinerated, but are instead naturally recycled, eliminating waste generation. Producing bags from waste saves 800 annual tons of virgin material from being produced and used, so it doesn't get the chance to impact the environment, and from being landfilled or incinerated as waste.

Freitag has created jobs for 250 people from different parts of the world.

Strategy 2 - Recover Resources After Disposal

Collection and Recycling

I:CO (I:Collect) – Germany

I:CO has been a leading global solutions provider for the collection, certified sorting, reuse, and recycling of used clothing and shoes since 2009. It is a subsidiary of SOEX, which specializes in collecting used textile and shoes all over the world, sorting, domestic sales and exports of second-hand clothing, and recycling used textiles. I:CO has more than 2,000 employees, and processes more than 700 tons of material every day¹⁵. Through their in-store take-back system and a partner network, I:CO offers fashion brands and retailers an end-of-life solution for their products. I:CO is based in Germany, operates in more than 60 countries, and has offices in the USA, UK, China, and Japan.

<https://www.ico-spirit.com/en/>¹⁴

Collecting, Sorting, and Circular Supply Chains

System approach

I:CO has developed a system for collecting used clothing and shoes as well as accurate and certified sorting for either reuse or recycling. The main objective is to ensure the maximum reutilization of these materials. The I:CO take-back system collects used clothing and shoes at a retailer's point of sale. The collected items are then carefully sorted and directed towards reuse or recycling, irrespective of the producing brand. Wearable items go to new wearers, whereas unwearable ones become cleaning cloths or get recycled into fibers for insulation, carpet padding, toy stuffing, and new clothing.

Collection:

the I:CO take-back system

I:CO partners with local retailers wherever they operate. The idea is to use the retailers' points of sale as collection points for used items, with bins that are branded according to partners' preferences. In this system, consumers bring in their used clothing or shoes to the partner retailers' stores and are given a reward incentive, like a voucher for their next purchase (e.g. 10 to 15% discount coupons). Any garment regardless of brand that is dry and clean is accepted. Thus, used clothing and shoes are collected in the same place where new ones are purchased.

Sorting:

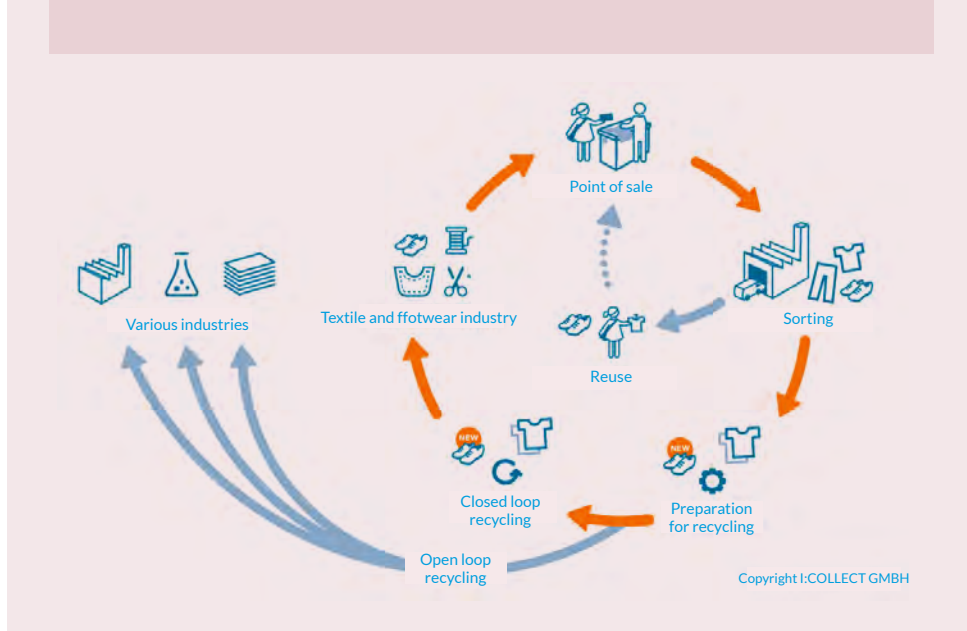
the basis of efficient reutilization

I:CO also has a network of logistics partners and certified sorting facilities on a global scale. All items collected at partner stores are transported to the nearest sorting facility, by means of individually tailored logistics. Every item is sorted by hand and categorized according to up to 420 different criteria (quality, materials) for identifying how it can best be utilized. Using this approach, I:CO guarantees precise, high-quality sorting and evaluation.

After the sorting process, the clothes and shoes are either given a new life through reuse as second-hand goods or recycled to become new products. At present, the majority of fibers are made into insulation material for the automotive and construction industries. Particularly absorbent textiles are used for the production of cleaning cloths. Other textiles are mechanically recycled (shredded into fibers) and serve as the raw material in the production of insulation materials or painters' drop cloths. Even the dust produced during the mechanical recycling process is pressed into briquettes for the cardboard industry. Textiles not suitable for any of these purposes are used as combustibles for energy production.

¹⁴ All of the information contained in the present publication has been acquired through the company's official website and other public sources.

¹⁵ UrbanWINS Project funded by the Research and Innovation Program Horizon 2020 – Best Practices/ I:CO Textiles and Shoes Take-Back System: <https://www.urbanwins.eu/i-co/>



Potential for a circular supply chain

One way to close a circle in the fashion industry is to spin recycled fibers into yarn to make new textiles, but currently only a small portion of recycled fibers can be used to produce new yarn. I:CO uses its years of experience and strong infrastructure to support partners in creating their own circular supply chains and gets involved in international research projects in collaboration with various partners. One such project for denim-to-denim recycling that I:CO developed with a retail partner successfully produced 1,000 tons of recycled cotton from post-consumer waste in 2016 and rerouted it to the manufacturing of new denim.

Impacts and Added Value¹⁶

I:CO has contributed significantly to the expansion of the collection and recycling sector for end-of-life clothing and shoes. The corresponding value added has increased with the reevaluation of 225,000 tons of collected used items. Around 142,500 tons per year of wearable items were sorted from the collected garments and supplied to the global resale market.

I:CO's collection and recycling business has diverted 225,000 annual tons of used clothing and shoes from landfill and incineration, reducing the environmental impacts associated with managing that amount of used clothes and shoes. This also saved the corresponding 225,000 annual tons of virgin material (cotton, plastic, leather, etc.) from being extracted and processed, eliminating associated environmental impacts.

I:CO's take-back system motivates consumers to contribute to recycling efforts, raises their awareness, and rewards them with an incentive. Sorting out wearable items and directing them to re-use channels strengthens the habit of using second-hand clothing and shoes. New jobs are created in logistics, sorting, recycling, and second-hand markets, in addition to I:CO's 2,000 employees. Their partner companies donate 2 cents of a euro to a charity fund for every returned kilogram of shoes, linen, clothing, and other textiles, amounting to a total fund of 5 million EUR per year designated for charitable projects.

¹⁶ Figures are based on the data that 700 tons of waste are processed every day; of this waste, 57% is resold, 33% recycled or reused, and 10% becomes residue.

Deniz Tekstil Grup – Turkey

Deniz Tekstil is an affiliate of the Deniz Group, which in addition to textiles operates in the automotive, construction, and insurance industries. It was established in 1994 and currently operates in the Textile Organized Industrial Zone in the Turkish province of Uşak, which has become a hub for the national textile recycling industry in the years since 1984. Deniz Tekstil specializes in pre-consumer textile waste recycling and is one of the largest companies of its kind. It has a daily production capacity of 100 tons of recycled fiber and employs 180 people. The facility processes cotton, polyester, lycra, and polyester/cotton blends. 70% of the regenerated fiber they produce serve the local market, and the remaining 30% is exported. Deniz Tekstil's customers are mainly yarn producers that can process regenerated fibers.

<https://www.deniztekstilgrup.com/>

Pre-consumer Textile Waste Recycling

From waste to regenerated fiber

The Textile Organized Industrial Zone in the province of Uşak hosts a cluster of around 150 companies and more than 10,000 employees that participate in the textile recycling value chain. They account for 75% of the textile recycling market in Turkey. The companies mainly recycle yarn and fabric waste for fiber production as well as produce yarn and felt from recycled fibers. There are a few companies converting PET bottle waste into fiber and manufacturing felt production machines. Deniz Tekstil is one of the key members of this cluster, an active part of the region's 30 years of tradition, and is motivated to decrease the need for virgin materials, particularly cotton, and maintain its share of the growing recycled-fiber market. The basic challenges that the company faces are the problems of finding qualified staff, the supply of raw material, and the continuous need to keep up with recent technologies.

Deniz Tekstil generally receives textile waste from garment producers all over Turkey, through intermediary companies licensed for waste collection and transportation. Waste is sorted manually by color and type and then fed to cutting and opening machines to be separated into their fibers. The waste-to-product conversion rate is roughly 70%, with 30% representing waste deemed unsuitable for production and textile dust generated during the mechanical cutting and opening processes. These residues are given back to waste collectors to be disposed of.

The color and type of material of the produced fibers is determined by the color and type of the waste received. No additional dyeing processes are implemented and no chemicals are used in production. About 160 different colors of fiber, GRS-certified (Global Recycle Standard), are produced and sold to open-end yarn production companies as a raw material.

Fabric waste that is mixed in color and type is used to produce a lower quality of recycled fiber for nonwoven (felt) production, sold to felt producers for use in the automotive, furniture, white goods, and construction industries. The better the quality of the waste and the more efficient the sorting, the higher the added value obtained from the regenerated fabric.

The company's product range includes 100% cotton fiber, cotton/lycra blended fiber, and cotton/polyester blended fiber, which are all suitable for yarn production, besides different types of felt fibers. 75% of Deniz Tekstil's fibers are sold to yarn producers, while the remaining 25% goes to felt producers.



Impacts and Added Value

The net amount of fabric waste converted to product is roughly 36,000 annual tons. Disposal would cost the producers of this waste around half a million EUR a year, but selling it to Deniz Tekstil through intermediary companies earns them roughly 2.6 million EUR a year, resulting in an additional annual income of 3.1 million EUR. Moreover, the price of recycled fiber in the market is around 870 EUR per ton, and selling recycled fibers generates significant turnover and expands the recycled materials market.

Those 36,000 annual tons of industrial textile waste are diverted from landfill and incineration, and the environmental impacts associated with managing that waste are reduced. This also saves the same tons of virgin material (cotton, lycra, polyester, etc.) from being extracted and processed, eliminating associated environmental impacts.

Deniz Tekstil currently employs 180 people in Usak as well as other neighboring provinces.

Elvis & Kresse – UK

Established in 2005 in Kent, England, Elvis & Kresse is a sustainable luxury company which turns industrial waste into innovative lifestyle products. The business was established by two partners, James Henrit and Kresse Wesling, driven by environmental and social concerns. Their key motivation was recovering London's damaged fire-hoses, which were being discarded and going to landfills every year, and using them to manufacture a range of wallets, bags, belts, purses, and accessories for men and women. Elvis & Kresse is a certified Benefit Corporation (B Corp). The company employs 25 people full-time and many more on an outsourcing basis.

<https://www.elvisandkresse.com/>

From Trash to Turnover: Upcycling

Sourcing waste materials for production

The innovativeness of Elvis & Kresse's business model lies in manufacturing products from waste streams that are not traditionally recyclable, helping to solve niche waste problems. The company currently manufactures products from ten different waste streams/materials on a regular basis:

- When London's hoses are damaged beyond repair, they are collected and upcycled into sustainable luxury bags and accessories such as belts, wallets, etc.
- The handles, sides, and base of the bags are crafted from decommissioned fire-hoses and the outer panels from rescued leather off-cuts.
- Failed parachute panels and auction banners are used as lining materials and dust covers.
- The peripherals are made with reclaimed materials such as coffee and tea sacks, closed-cell foam, and old auction banners.
- Waste parachute silk is used to line bags and wallets.

- Additional packaging and labelling is made from second-hand shoe boxes and coffee sacks.
- Their range staples include printing blankets, split scaffolding wood, and reclaimed leather off-cuts.

Elvis & Kresse also turn parts of their own wastes into biomass, while other waste such as fire-hose off-cuts are used for flooring or other products such as cufflinks and key rings.

Creating luxury items

All Elvis & Kresse pieces are handmade and strictly quality controlled. Starting with the design process, they prioritize the durability of their products and through craftsmanship extend their life as much as possible. They use a technique that emulates kintsugi, the Japanese art of repairing broken pottery with gold. Timeless, ultra-durable design, and the uniqueness of their products allow them to market their items to the luxury segment. They also offer the option to personalize items, inspiring personal attachment. In addition, the company offers samples of new products for review before they enter into actual production.

Partnerships

Elvis & Kresse have developed a number of key partnerships which have been essential for the company's success, in terms of both sales and sourcing materials for production. As part of their partnership approach, the company collects fire hoses directly from the London Fire Brigade across the entire UK, which thereby prevents waste from heading to the landfill and saves the brigade money. Interest from the London Fire Brigade, as well as the Firefighters Charity, who receive donations based on Elvis & Kresse's profits, helps minimize their own marketing efforts and costs. In some cases, the waste partnerships that companies create also enable a sales relationship. In 2017, Elvis & Kresse entered a five-year partnership with the Burberry Foundation to recraft 120 tons of leather off-cuts from the production of Burberry products into a range of new luxury leather items, designed and sold by Elvis & Kresse.



Impacts and Added Value

Elvis & Kresse's growing turnover was 300,000 EUR in 2011¹⁷. They create added value out of waste and sell their products at an average price of around 220 EUR, expanding the upcycled products market. In parallel, waste-generating partners save money because they no longer need to dispose of their waste.

As of 2020, Elvis & Kresse have saved 225 tons of waste from landfills, reducing the environmental impacts associated with managing that waste. The corresponding tons of virgin materials (plastics, leather, etc.) were saved from being extracted and processed, eliminating associated environmental impacts.

The waste-associated charity partners benefit from Elvis & Kresse's profit; 50% of profits are donated back to charities. Elvis & Kresse have also created jobs, apprenticeships, and work experience opportunities through their partnerships.

¹⁷ ERA-Net ECO-INNOVERA – Green Business Model Innovation/ Business Case Study Compendium: https://www.eco-innova.eu/publications@lwt_338cmd=download&lwt_338id=195

IDYR – Morocco

In Morocco, there are almost 32,000 women living in poverty and vulnerable situations, mainly in rural areas with no work opportunities for their experience and skills. With this in mind, the two entrepreneurs Fadwa Moussaif and Amal Kenzari established IDYR in 2017, a social and green enterprise which transforms textile scraps into useful products. They created the IDYR brand to give rural craftswomen the chance to be self-sustaining and more independent. IDYR not only respects the social conditions of these women artisans but also creates sustainable fashion products by highlighting Moroccan know-how. The products are targeted at active urbanites, who shop online. Partnering with international shopping platforms, they have plans to export their products, primarily to China, Netherlands, England, France, and Italy, where they already have some connections.

<https://idyrdesign.com/>¹⁸

Giving Scraps a New Life with Upcycling

IDYR's main business is based on the practices of reinventing unwanted materials and transforming them into useful products. Each IDYR product is woven by hand from scrap fabrics collected from the clothing and textile industries. These scraps become new, original fashion accessories (such as handbags, rugs, and pillows), and open up the possibility to employ women.

IDYR's upcycling technique is based on Boucherouite, an ancient weaving technique invented by poor Berber families. Each item is unique and is imbued with culture, history, and exceptional human value.

The production steps are as follows:

- Design of the collection.
- Purchase of raw materials (scraps, zips, leather parts, etc.)
- Transportation of materials by delivery partners or their suppliers.
- Sorting of fabric and storage of different materials.
- Transformation of fabric into weaving by women artisans.

- Assembly of the parts (weaving, leather, and other parts).
- Delivery of products by partner agencies.

Production especially requires handcrafted weaving and leather application. IDYR works closely with garment and leather companies through different types of collaborations according to the needs of both parties:

- Purchasing fabric falls from garment factories when needed and creating a new product under the IDYR brand.
- Purchasing end-of-collection coils to line accessories (consists of purchasing leather collection ends for making capsule collections and/or their linings).
- Partnering with companies under the Corporate Social Responsibility (CSR) program and transforming their scraps into new accessories for them to offer their customers.



¹⁸ All of the information contained in the present publication has been acquired through the company's official website and other public sources.

Products and production capacities

Product	Selling price	Production capacity
Bags	Approx. 30–150 EUR	300 pieces per month
Leather goods	Approx. 8–30 EUR	800 pieces per month

Impacts and Added Value

IDYR reduces its production costs by using waste instead of virgin material and offers slightly cheaper products compared to other similar brands. This business generated a total turnover of approximately 75,000 EUR in 2019, up 80% from 2018. IDYR makes its business even more efficient by selling 90% of its production (100 items on average) on a monthly basis, avoiding overstock.

IDYR has so far saved over 10 tons of fabric scraps from landfill and incineration and annually recovers more than 3.5 tons of textile waste and leather offcuts, giving them a new life by upcycling them. This saves those same tons of virgin materials from being extracted and processed, eliminating the associated environmental impacts. In addition, IDYR has increased awareness in five companies of the importance of recycling and upcycling.

With this innovative business, IDYR has breathed new life into Moroccan heritage. More importantly, IDYR has provided employment opportunities for ten women artisans and a leatherworker from rural areas, as of 2020. They also help raise awareness in society of slow fashion and circularity.

Strategy 3 - Extend Resource Use and Reduce Disposal

Design for Durability, Long Lasting and Modularity

Flavialarocca – Italy

Flavia La Rocca founded her brand in Italy in 2012 under her own name. She focuses on sustainability when designing her womenswear collection, and makes clothes in a responsible, dynamic, and innovative way. Every collection is made in Italy by local artisans, and the garment design is built on modularity using recycled, natural, and regenerated fabrics (100% eco-certified).

<https://flavialarocca.com/>¹⁹

Modularity with Interchangeable Parts

Flavialarocca's business model uses modularity to extend the life of its garments: each piece in a collection is interchangeable and compatible with other pieces. This is so that the wearer can mix and match these convertible, multifunctional clothes to create a versatile set of looks for different situations and social occasions, in varying weather and through changing seasons.

Design is key for extending garment lifespan

Flavialarocca's dynamic product is a set of modular garments that can be transformed into different types of pieces. The key design strategy involves using hidden zippers, ties, and other no-sew fastenings that allow components to be attached and detached. Thus, sleeves and hemlines can be changed and style and details switched up to create a never-ending wardrobe²⁰.

There are also many color options for buttons and adjustable buttonholes for different combinations.

A standard modular garment can be used 40 different ways. Interchanging parts also facilitate disassembly, reassembly, and repair in case of damage, and upgrading garment modules is easy.

Impacts and Added Value

Modular design extends the useful life of garments so they retain their highest economic value. Increasing functionality prevents the production and purchase of new garments and decreases the associated costs.

As increased reuse of garments decreases new garment production, the environmental impacts (use of water, raw materials, chemicals and energy, waste and emissions) associated with production processes are reduced. Overall waste is reduced because transformability limits consumption. In addition to implementing modularity, Flavialarocca also uses natural fibers and helps decrease overall environmental impact before and after disposal.

Modularity offers convenient and flexible garment use, and consequently reduces clothing needs and uses fewer resources. Wearing garments in different combinations for different occasions saves on budgets by reducing individual consumption.

¹⁹ All of the information contained in the present publication has been acquired through the company's official website and other public sources.

²⁰ The Living Wardrobe: Fashion Design for an Extended Garment Lifetime, thesis by Cramer J., RMIT University:

https://researchrepository.rmit.edu.au/discovery/delivery?vid=61RMIT_INST:ResearchRepository&repld=12248228530001341#13248374120001341

Houdini – Sweden

Houdini Sportswear was founded in 1993 in Sweden by Lotta Giornofelice, who saw there was a need for products for outdoor life and activities with all-purpose performance. Houdini began its journey as a start-up and moved towards becoming an SME. Today, it is operated by 50 employees in 18 markets. The company also follows sustainability criteria in bringing their functional and innovative approach to the outdoor industry. The Houdini Sportswear's business model is future-oriented, with a circular economy at its core. Today, 80% of Houdini's clothes are circular. Their ultimate goal is 100% circular production in the near future, focusing on product durability and lifespan extension through repair.

<https://houdinisportswear.com/en-gl>²¹

Product Durability

Producing long-lasting products is the fundamental strategy at Houdini, and its design philosophy focuses on the durability and high performance of garments. To achieve this, Houdini prioritizes durable, environmentally friendly materials in their production. The average lifetime of Houdini garments is between 10 and 15 years, and durability is technically based on production methods and type of materials used. All garments are made with tight-gauge knitting and an inner fleece (composed of three separate yarns) for greater strength and produced using double threads.

To achieve their desired quality and durability, Houdini does its sourcing through a highly selective partnership strategy based on long-term relationships with world-leading fabric and technology supplier partners and manufacturers. Houdini particularly focuses on a partnership strategy that improves trust and transparency, which makes analysis of current practices possible, facilitates improvement plans, and attracts investment in innovation projects. Manufacturing takes place at selected and specialized European manufacturing partners in accordance with Houdini's quality and durability standards and requirements.

Houdini has incorporated repair services into its business model for greater durability and longevity and to facilitate the long-term use of their products. (See the [repairing and upgrading](#) business model).

²¹ All of the information contained in the present publication has been acquired through the company's official website and other public sources.

Strategy 3 - Extend Resource Use and Reduce Disposal

Repairing and Upgrading

Houdini – Sweden

Houdini Sportswear’s business model incorporates design for durability with repairing services in order to ensure product longevity. For company information, see the business model [design for durability, long lasting and modularity](#).

<https://houdinisportswear.com/en-gl>²²

Long-Term Use Through Repairing

According to Houdini’s philosophy, “a little repair can often add years to a product’s lifetime”.

As such, Houdini provides a repair service free of charge should any part of the garment break before the garment itself is worn out. If the product is damaged, the same service is available for a reasonable price. The most common repairs include replacing zippers, fixing tears or broken seams, and replacing buttons or buckles.

In 1995 Houdini launched the Houdini Repair project, adopting a minimalist design philosophy that gives every garment reparability functions and features, with replaceable parts that facilitate repair²³. Houdini continues to complement its business concept of extending product lifespan with repairing opportunities.

Impacts and Added Value

Houdini’s durability and repairing-based business has triggered the expansion of the functional and sustainable outdoor apparel market. Houdini had a turnover of 15.5 million EUR between 2017 and 2018, with a current turnover of 20 million EUR²⁴. Each year saw a 20 to 30% increase in growth. Product durability and repairing prevents the production and purchase of new garments and decreases the associated costs.

Houdini’s design practices and production methods are reducing the overall environmental impact of standard textile production while saving natural resources. The figure below shows Houdini’s circular business approaches and their impacts on environmental issues. A double plus (++) indicates very relevant/positive impacts on selected criteria, whereas a single plus (+) shows positive relevancy²⁵.

²² All of the information contained in the present publication has been acquired through the company’s official website and other public sources.

²³ Business model development for sustainable apparel consumption - The case of Houdini Sportswear, by Holtström J., et al, Linköping University: <http://www.diva-portal.se/smash/get/diva2:1368182/FULLTEXT01.pdf>

²⁴ If You Pollute, You Have to Pay, by Koester V. and Karlsson E., Chemistry View Magazine: https://www.chemistryviews.org/details/ezone/11161691/If_You_Pollute_You_Have_to_Pay.html

²⁵ Planetary Boundaries Assessment 2018, This is Houdini by Houdini Sportswear, Albaeco, Mistra Future Fashion: https://api.houdinisportswear.com/storage/2A69199BFCBA925CC92260D61F41301EA566C760FB9A727B5DABB2C330C13D1BC/08df8496f36f49f0bb821fdeafdd775e/pdf/media/e5eec5e201b242e9a2aa14aba9c3b696/Houdini_Planetary_Boundaries_Assessment_2018.pdf

	Climate charge	Novel entities	Stratospheric ozone depletion	Atmospheric aerosol loading	Ocean acidification	Biogeochemical flows	Fresh water use	Land-system change	Biosphere integrity
Recycled fibres	+	+	+	+	+	++	++	++	++
Repairs	++	++	++	++	++	++	++	++	++
Rental	++	++	++	++	++	++	++	++	++
Reuse	++	++	++	++	++	++	++	++	++
Long lasting (style and endurance)	++	++	++	++	++	++	++	++	++
BlueSing	+	++			+	?	+		
pH Pure™		++							

Longevity and repair services create customer attachments through reliability and long-term relationships. They also help raise end-user awareness of durable products.

E-Terzi – Turkey

E-Terzi was founded in 2015 by Erdal Eryılmaz in Istanbul as an online tailor servicing all of Turkey. Its premise was that “everybody needs a tailor because everybody has garments”. E-Terzi aims to be a trustworthy tailor and establish long-term relationships with its customers, offering a high-quality repair and modification service and being easily accessible online. The team consists of three highly experienced tailors, two support members, and a webmaster. E-Terzi repairs and modifies all types of garments and particularly leather products. They can also sew custom-made leather garments for clients.

<https://www.e-terzi.com.tr/>

Value Creation Through High-Quality Garment Repairs and Modifications

E-Terzi has modernized traditional garment repair and tailoring: they are easily accessible through their website, which is their main advertising and marketing channel.

The value proposition E-Terzi makes is to provide customers who want to get their garments repaired or modified with a way to communicate easily and a high-quality service that includes follow-ups. The most significant success factor is the very experienced and qualified tailors in charge of the repairs and modifications. Customers seeking a service for a certain product send E-Terzi a photo and receive a prompt reply detailing the process and price. If the customer accepts, the product is picked up from their home and delivered back once repaired or modified. E-Terzi specializes in leather garments, which require special skills and machines, and generates even higher value due to the high cost and environmental footprint of leather.

A contemporary approach for a traditional business

Based on increasing internet usage rates in Turkey and the technological trends in this direction, the founder of E-Terzi foresaw that in ten years' time 95% of the population would be shopping online and on mobile phones and shaped his business model accordingly. He first researched the number and types of internet searches for tailoring services. Based on those results, the service categories were created and the necessary equipment and machines set up. He made visual examples and references for each service category on the website in order to show customers how repairs and modifications are done.



Impacts and Added Value

E-Terzi has developed significantly in five years' time. Today they receive more than a thousand inquiries each month. In 2019, they repaired and/or modified 3,128 items, including both leather and textile garments, preventing the production and purchase of new garments and decreasing associated costs. Especially for leather items which cost more than 100 EUR each, this option provides considerable savings for the consumers as well.

In 2019, E-Terzi repaired 1,217 leather and 1,911 textile garments of various types. This roughly corresponds to 1.5 tons of leather and 1 ton of textiles that were retained in the system, preventing the production and processing of that amount of material. This reduces the overall environmental impacts associated with that production as well as waste and diversion from landfilling/incineration.

E-Terzi gives consumers a low-cost option for reviving their defective or unwanted garments. This has an emotional aspect as well, since consumers can get family keepsakes repaired by E-Terzi and wear them once again. Moreover, E-Terzi has plans to expand its team by creating a network of experienced and qualified tailors from different parts of Turkey, both facilitating their services in different provinces and providing such artisans with a professional opportunity to carry out their skills.

thredUP – USA

ThredUP was launched as a peer-to-peer sharing service for men's shirts in San Francisco, USA, in 2009. The idea behind the business was formed when CEO James Reinhart spotted the potential hidden in piles of unwanted clothes in everyone's wardrobe. At first, only men could swap clothes through thredUP. After further developing their business, thredUP is now named one of the world's largest fashion resale platforms that offer men's, women's, and kids' second-hand clothes and accessories from millions of brands. thredUP simply aims to promote reuse over purchasing new. Its business model is based on resale/second-hand together with the resale-as-a-service (RAAS) platform. With four distribution centers, thredUP moves nearly 100 million garments from closets across the USA and has millions of customers.

<https://www.thredup.com/>²⁶

A Fashion Resale Marketplace

As of 2018, the value of the global resale market was calculated at 20 billion EUR and is estimated to reach 44.5 billion EUR in five years²⁷. In order to capture this value, thredUP has introduced an online thrift shop, which lists 30,000 new items every single day. The platform's many features help users benefit from the different sides of the market as a buyer or seller. Customers can give their unwanted clothes a second chance and earn money doing so. The thredUP business model includes garments and accessories mainly from big fashion brands, a high number of which can be found on the online platform. A seller can earn 5 to 90% of the listing price on accepted items, where high fashion brands net a higher percentage. Besides the cash payment or credits option, the platform gives the seller the option to donate (4.30 EUR per kit) to a charity of their choice.

How does it work?

There are six steps for people who want to sell their unwanted clothes through the platform:

- 1. Order a bag online:** the seller orders a pre-paid "Clean Out Kit", or a "Donation Clean Out Kit" for donation, from the thredUP website.
- 2. Fill it up:** the bag is filled with the items and sent back to thredUP.
- 3. Quality control and assessment:** received items are carefully inspected by thredUP for certain criteria: no signs of wear, no damage, and no alterations.
- 4. Acceptance:** on average 40% of items are accepted, and others are returned to the customer or recycled.
- 5. Listing items and pricing:** accepted items are professionally photographed and listed in detail. The pricing changes based on seasonality, quality, retail price, and brand.
- 6. Payment:** once the items are sold, the seller is paid or gets credits for the items on the platform.

The resale-as-a-service (RAAS) platform

thredUP has powered its resale business with an innovative approach by developing a new platform for a resale-as-a-service (RAAS) model. This platform offers other companies the ability to implement the resale model without investing in developing it. Partners can directly connect to thredUP's technical infrastructure and expand their business through resale. thredUP is already partnered with some big brands. The brands gain new customers and increase their sales, and retailers can receive a constant stream of new arrivals by adding thredUP's products to their store. The number of partnerships is expected to increase, as 90% of retailers have stated that they are planning to adopt a resale model into their business.

²⁶ All of the information contained in the present publication has been acquired through the company's official website and other public sources.
²⁷ thredUP 2019 Resale Report: https://www.thredup.com/resale?tswc_redir=true

Impacts and Added Value

thredUP has developed an online marketplace that generates approximately 43.7 million EUR through buyers, sellers, and retail partners. It has raised more than 277.7 million EUR in funding in ten years²⁸. thredUP ranked 44th among other American online stores, with approximately 332 million EUR of global net sales in 2019²⁹.

Total Impact	Comparison
0.64 million tons of CO ₂	48 million cars off the road for a day
2.7 billion kWh of electricity	Lighting up the Eiffel Tower for 340 years
22 million tons of water	Filling up the Bellagio fountain 29 times

This business has been reducing waste generation and the use of virgin resources by extending the lifespan of garments and accessories. By sending unaccepted items to recycling, it increases the recycling rate of garments which would likely end up in landfills.

thredUP's business provides consumers with a creative solution to consume responsibly while attaining fashionable garments and accessories at advantageous costs. thredUP has made it easy for customers and retailers to participate in the second-hand market and created a significant number of jobs in the form of employees and suppliers. Moreover, thredUP facilitates donation, through which the related partners benefit from.

²⁸ Crunchbase business information platform: https://www.crunchbase.com/search/funding_rounds/field/organizations/funding_total/thredup

²⁹ E-commerce revenue analytics: <https://ecommercedb.com/en/store/thredup.com>

Tarz2 – Turkey

Tarz2 was founded in 2017 by an entrepreneur, Ahmet Senol, who has been using second-hand goods since childhood. Based on a growing interest in the second-hand market in Turkey, he decided to set up an online platform for buying and selling second-hand garments. He aimed to help change the perception of consumption and promote resale markets. The process started with R&D studies conducted in a university technology park where the company was initially established. Today, Tarz2 is one of the most active resale platforms used in Turkey, offering all types of second-hand garments and accessories for women, men, children, and babies.

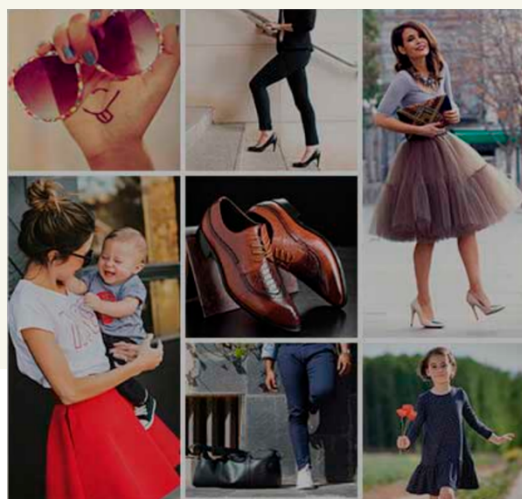
<https://www.tarz2.com/>

Second-Hand Like New

Tarz2 provides customers with buying and selling opportunities for second-hand garments and accessories. They mainly focus on offering original, “like-new” products from more than 4,000 popular and premium brands, requiring a very delicate selection and quality-check process for the items from sellers. The only thing that a seller needs to do is to order a delivery kit online, fill the bag up with the items to be sold, and send it to Tarz2 free of charge. The rest of the process is managed by Tarz2. As the items are sold, the sellers get their share, varying between 50 and 80% of the price of the product. Based on the preferences of sellers, earnings are either paid to them or donated to an NGO of their choice. The buyers get significant discounts, quality assurance, and free returns on purchased items. Technology and innovation are an inseparable part of the Tarz2 business, and the team makes continuous efforts to keep their services up to date.

Efforts to raise awareness and change mindsets

Tarz2 places special emphasis on raising awareness, underlining their sustainability approach and how reselling contributes to global sustainability. They try to change the perception of wearing second-hand and prompt consumers to adopt slow-living and slow fashion practices through their blog and social media accounts. Customer comments and experiences are also published on the website, helping the concept to spread and be adopted.



Impacts and Added Value

Tarz2 has played an important role in developing the second-hand garment and accessories markets in Turkey, and as a business, it is continuously growing. In giving so many garments and accessories a second life, Tarz2 helps prevent the production and purchase of new garments and decreases associated costs.

By extending the lifespan of garments and accessories, the use of virgin resources and waste generation are reduced and all environmental impacts associated with extraction, production, distribution, and waste management are decreased.

Tarz2 particularly focuses on changing mindsets about second-hand shopping and helps people adopt a slower way of living, through its reliable, functional system and awareness raising efforts. With the help of Tarz2, consumers can find high-quality, like-new products from well-known brands, at significantly lower costs compared to average market prices.

OhLook – India

OhLook was launched in 2016 as a start up in India. OhLook is a fashion platform offering a men's clothing rental subscription service. It is the first "everyday fashion rental subscription and styling service for men" that lets them wear different clothes every single day, handpicked by stylists. The primary intent of the model is to make fashion accessible and easy for the everyman. They are mainly targeting men between the age of 21 and 35 in India's upper middle class. Today they have 45,000 users. Currently, the company employs 19 people and operates 100% domestically. OhLook plans to shift to sustainable and biodegradable clothes and create their own brand.

<http://www.ohlook.in/>

An Everyday Fashion Rental Subscription for Men

Today, the average number of wears over the lifetime of a garment has dropped down to just seven. OhLook's founders thought that an everyday fashion rental service would be an apt solution to users and the increasing environmental risks of fast fashion. Their subscription-based style curation and clothing rental service lets men wear different fashion garments from the top brands and latest trends each year. Through this service, the user gets to wear a different and unique shirt every day as the average number of wears per shirt successfully increases from 7 up to around 70 to 75 times. OhLook enables users to rent clothes from their website through a subscription rental model. Users are provided with an unlimited closet with multiple novel offerings. In addition to renting, their services include delivery, cleaning, and styling. The price starts at approximately 20 EUR a month.

How does it work?

There are five stages in OhLook's business model:

- 1. Selecting the clothes:**
upon signing up, the user fills out a style form and chooses from over 12,000 garments; then prepares the box and checks out.
- 2. Receiving a package:**
every week, the user receives a box of five shirts, which will later be exchanged for a new box of five the subsequent week. The shirts are neatly packaged and shipped to customers' doorsteps.
- 3. Exchanging a package:**
the package is exchanged for a new set of clothes. The user will not receive the same clothes again.
- 4. Cleaning and hygiene:**
clothes are cleaned at OhLook's cleaning unit to the best washing standards, to retain quality and increase lifespan. Then, the clothes are sanitized and steam ironed, in a 100% hygienic cleaning process.
- 5. Preparation for the next user:**
after the cleaning process, the clothes are repacked and sent to OhLook's style house.

A technology-based styling service

OhLook only offers their services through the internet. Users can access all services through an app on their online devices (laptops, smartphones, etc.). OhLook's artificial intelligence technology, built on the expertise of multiple stylists, understands what shirts would look good on which customers based on their personality and style preferences; then it auto-chooses shirts for them. Selected items are then reviewed by an actual stylist before being shipped to the user.

On-demand luxurywear rental

OhLook provides an additional service for luxurywear (suits, blazers, etc.) on an on-demand rental basis, where the user can wear an expensive piece of garment for a specific date. The users choose from an array of clothes listed and reserves their choice for a particular date. The garment gets delivered to the customer's doorstep the day before and is picked up within four days from the date of delivery. This offer enables users to enjoy the luxury of an unlimited wardrobe "in the cloud" at just 12% of the maximum retail price.

Impacts and Added Value

OhLook's business model has created a profitable business in a short time. Each shirt earns OhLook 12 times its price. After the major expenses of inventory, logistics, packaging, and laundry are deducted, 60% of the gross profit is saved.

The life of each garment is increased tenfold, as they are reused over 70 times. Typically a shirt is discarded after seven washes. This reduces resource consumption and the overall environmental impacts associated with extracting and processing raw materials by roughly 90%; the corresponding 90% of garment waste is diverted from landfill and incineration. So far, 4,000 shirts have been used 70 to 75 times each over their lifetime in OhLook's business, and 12,000 more items are still in their inventory.

Consumers get fashionable clothes at advantageous prices and simultaneously adopt the concepts of sharing and sustainability. All the clothes retired from OhLook's services (4,000 shirts so far) are donated. Job opportunities have been created for over 30 people.

MUD Jeans – The Netherlands

MUD Jeans was founded in 2012 by Bert van Son on the belief that there should be an alternative to fast fashion. Its mission is to change the fashion industry by producing premium quality jeans in a fair and circular way and to inspire others to go circular. The basis of its business model is leasing jeans, which has been implemented using different circular practices. MUD Jeans is headquartered in Laren, the Netherlands, and they have 11 employees. Currently they have three main supply chain partners: one recycles the jeans, the other makes new fabrics, and the last one focuses on stitching and washing. Their jeans are sold in 300 stores in over 29 countries and shipped worldwide but the majority of the sales come from the Netherlands, Germany, Belgium, Austria, and Switzerland.

<https://mudjeans.eu/>

A Way to Maximize a Product's Use: "Lease a Jeans!"

MUD Jeans introduced the innovative concept of leasing a pair of jeans in 2013, allowing their subscribers to lease instead of purchase jeans. MUD Jeans' Lease A Jeans service includes cleaning, maintenance, and repair. Accordingly, MUD Jeans has also transformed its operations to develop longer lasting jeans.

Through design and material selection, jeans can be used by multiple users several times and returned ones can be repaired to extend product lifespan or reprocessed into valuable material for new jeans. Consumers can use the jeans without owning them, and return them after a period of time. This also ensures the products are collected at their end of life. They increase resource efficiency by closing the loop through their concept, supported by their reverse supply chain and mechanical recycling scheme.



How does the system work?

Customers pay a one-time sign-up fee of 29 EUR to start leasing. They can lease a pair of jeans for 7.50 EUR a month for 12 months and then decide to keep the jeans or switch them for a new pair on a new lease. Customers are especially encouraged to send the jeans back at the end of their use to prevent them from ending up as waste. They are also given the option to send in their old jeans (as long as they are 96% cotton) to obtain a 10 EUR discount or a month free on their lease. MUD Jeans applies the never-out-of-stock principle by having no seasonal collection. This limits design costs and avoids dead stock by producing on demand. They always have jeans in stock and retailers can (re)order small quantities.

Use products for longer through a free repair service

The leasing system involves a repair service as well. During the leasing period, the subscriber can benefit from the free repair service in case of damage. The service is free during the leasing period only and in the free shipping zone (NL, BE, FR, and DE).

The repair service is also an option for jeans owners. MUD Jeans offers a repair service for their subscribers to encourage them to use their products as long as possible. Accordingly, jeans owners are provided the service free of charge for one year.

Circular Design and A Circular Value Chain

The circularity of MUD Jeans is not limited to their leasing and repair services. They aim to design the products and entire value chain accordingly, starting with the design phase. The materials are kept very simple; leather patches are not used. There are only two fabric compositions: one is 40% post-consumer recycled cotton and 60% GOTS-certified organic cotton; the other is 23% post-consumer recycled cotton, 75% GOTS-certified organic cotton, and 2% elastane. MUD Jeans have created a very simple supply chain with three supply chain partners, helping MUD Jeans better control the value chain. The loop is closed when they take the jeans back from consumers through the leasing system and use them for vintage or recycling, where the life cycle starts all over again.

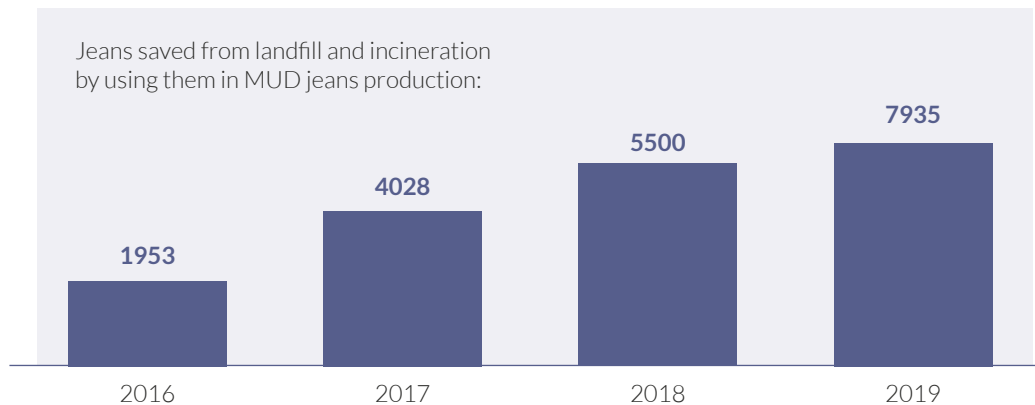
Impacts and Added Value

MUD Jeans' business has created an impact not only in the leasing but also the recycling and circular design markets. All of its circularity efforts have ensured a growing business, with a turnover that increased from 800,000 EUR in 2017 to 1.5 million EUR in 2019. It is expected to increase even further in the coming years and make a similar impact on the supply chain and relevant markets. Efficient utilization of each pair of jeans as well as material recycling have saved a significant amount of virgin material use and associated costs. Through a take-back system and circular value chain, MUD Jeans retains ownership of the raw materials, potentially protecting them from volatile cotton prices.

MUD Jeans' leasing model basically aims to prevent overproduction and overconsumption; hence it makes a significant difference in terms of environmental impacts compared to standard jeans.

Impact (average per pair of jeans)	MUD Jeans	Standard Jeans
Water consumption	2016: 1.500 lt 2019: 581 lt	7.000 lt
CO ₂ emission	2016: 8.88 Kg 2019: 7.14 Kg	23.45 Kg

Besides, the materials saved from landfill and incineration increases by the year. In 2019, 7,935 pairs of jeans could be saved by MUD Jeans production. MUD Jeans is exhibiting an integrated approach for sustainable resource management and use. Its business helps cotton's value chain be more efficient and circular.



MUD Jeans has created a community of jeans leasers (3,500 members in 2018) who have become part of this circularity effort and gained awareness of the circular economy and sustainability. Consumers feel the empowerment of consuming sustainably without generating any waste, and this motivates them to adopt more sustainable forms of living. By monitoring and reporting their impacts and sharing their experience, they continue to inspire and educate different segments of the community.

ORTA – Turkey

Founded in 1953 as a spinning and weaving company, ORTA transformed into a denim manufacturer in 1985. Today, ORTA operates at an annual production capacity of 60 million meters of denim in its Turkish factory with 1,500+ employees. It is a B2B company and supplies denim to garment manufacturers and brands. ORTA's main customers are denim brands around the world, but they also work with retailers. The company started its sustainability journey at the beginning of 2000 by using organic cotton. As an early supporter and adopter of sustainable fiber usage, ORTA founded its sustainability platform, Orta Blu, in 2010 (www.ortablu.org). Their mission is to drive the denim industry towards a more sustainable future.

<http://www.ortaanadolu.com/>

Circular Value Chains Through Sustainable Materials

ORTA's sustainability and innovation approach uses organic, BCI (Better Cotton Initiative)³⁰, and Fairtrade cottons as well as other sustainable fibers (TENCEL™ Lyocell, LENZING™ Modal, LENZING™ Viscose, LENZING™ ECOVERO™, hemp, linen, and bamboo) as well as post/pre-consumer recycled fibers, in certain ratios, based on product types and customer demands. ORTA's products containing recycled fiber are certified with the RCS (Recycled Claim Standard) and GRS (Global Recycle Standard), which applies to products with a minimum of 5 and 20% recycled content, respectively, and provides verified assurance. ORTA's efforts also include creating demand for sustainably grown cotton and other natural fibers, and stimulating eco-friendly fiber and chemical production.

Post-consumer recycling

To increase recycled fiber and close the loop, ORTA, an early adopter of circularity in its sector, collaborated with Levi's in collecting post-consumer jeans in 2012. Then they engaged a group of local women in a small village to remove the seams, labels, and metals on these post-consumer jeans before sending them to shredding facilities to be spun into yarns. The recycled yarns have been used to produce new fabric.

Life cycle assessment (LCA) for improving circularity

ORTA uses a life cycle assessment (LCA) tool for quantifying the environmental footprint of their products and the potential areas for a more sustainable and circular value chain. The tool allows them to fully see the impact of their systems through a holistic approach that looks at both the negative and positive effects of using different fibers and processes. Based on the results, ORTA improves its input materials and processes. LCA analysis of produced fabrics is also shared with customers through QR codes on hangtags. This way customers

can choose denim based not just on its physical properties but also its potential environmental impacts.

Recently, ORTA digitalized its LCA studies to publish on a platform and created a smartphone app where users can design their denim by choosing characteristics such as elasticity, weight, composition, color, and finishing and assess its environmental performance through LCA methodology compared to standard denim. With this app, ORTA takes the first step toward designing for sustainability.

ORTA partnered with Circle Economy, VF Corporation, and Auping and contributed to the development of the Circle Fashion Tool which is a decision-making tool for evaluating closed loop options for textile waste.



³⁰The Better Cotton Initiative (BCI) is a not-for-profit organization that exists to make global cotton production better for the people who produce it and for the environment. BCI farmers implementing this system are licensed to sell Better Cotton, and the products bearing the BCI logo have met BCI criteria.



Impacts and Added Value

In responding to the circularity expectations of its customers and meeting the relevant standards, ORTA has continuously increased sales and expanded its customer base. ORTA's step-by-step conversion to low-impact and recycled inputs have increased demand and promoted the markets for sustainable inputs and materials. Value and savings have been created through recycled materials and the elimination of virgin materials.

The circularity and sustainability at both company and value chain level has improved.

Overall environmental impacts stemming from the extraction, processing, and waste management of non-recyclable/biodegradable materials/products have been reduced.

ORTA has stimulated job creation in sustainable and circular materials and products.

Darwin's Botanicals – Turkey

Darwin's Botanicals was founded in 2015 as a family-owned company with only two employees. Based in Istanbul, Turkey, they produce fabric accessories such as scarves, headbands, headwraps, and bowties, and plan to expand their product line. Darwin's business has three main aspects: hand-dyeing fabrics with colors extracted from plants and food waste without using any chemicals; designing and sewing products using those fabrics; and raising awareness about the importance of botanical and food waste dyeing via workshops and talks. Their customer profile is eco-conscious urbanites who seek to add thoughtful pieces to their conscious closets.

<http://darwinsbotanicals.net/>

A Niche Business with 100% Natural Fibers and Dyes

Darwin's Botanicals' motto is adopting the way nature works to their business model: there is no concept of "waste" in nature. Darwin's produces accessories using only 100% natural fibers and natural dyeing materials. Dyeing materials include plants, flowers, fruits, and leaves at the end of their life cycles in addition to food waste. To upcycle dyes from plants and food waste, Darwin's has created a "network of waste" from cafes, restaurants, catering firms, and local florists who collect their waste and deliver it to Darwin's. No chemicals and synthetic dyes are involved in the production. All items are hand-dyed, making each of them unique. Although it is quite challenging, Darwin's strives for local suppliers and local manufacturers when choosing fibers. They primarily prefer hand-loomed if possible, or reclaimed and dead-stock fabric. They actively cooperate with an NGO to upcycle used natural fabrics.

Eco-friendly and gentle processing

Darwin's focuses not only on the input materials they use but on how they are processed as well. They try to minimize environmental impact by optimizing the process and using the same dye several times, storing the excess dye in a cold place for future reuse, and using rain and sea water and conducting solar dyeing when possible.



Trying to attract attention and point out a "gap" in the market

Since sustainable fashion and upcycling are pretty new concepts in Turkey and the target audience is not mature enough, Darwin's has needed to implement a push strategy since the beginning. They use their website and social media accounts to interact with like-minded brands and consumers. They have been supporting each other through several local retailers and concept stores who are interested in eco-conscious brands. In addition to such stores and online sales through the website, Darwin's is planning to open their atelier for visits and sales as well. They are also looking for opportunities to export in the future.



Impacts and Added Value

Darwin's Botanicals is quite a niche and small business. It has started to interact with certain brands and local retailers and given them sustainable, 100% natural accessories to add to their product lines, as a new business area.

By upcycling plant and food waste and using 100% natural materials besides eco-friendly production processes, Darwin's minimizes its environmental footprint compared to the impacts associated with a standard product's material extraction, production, distribution, and waste management processes.

Darwin's has created a community of eco-conscious consumers, NGOs, local retailers, stores, and other businesses. They raised awareness about sustainable and natural materials and at the same time benefit from the collected plants and waste for upcycling.

Strategy 5 - Shift to Circular Supplies and Renewable Resources

Slow Fashion in Full Control of the Value Chains

Kilomet109 – Vietnam

Kilomet109 is a contemporary fashion brand founded in 2012, based in Hanoi, Vietnam. They currently have eight full-time employees involved in the clothing design/production and sales for the brand. In addition, they collaborate with local artisans. Kilomet109 produces high-end handmade sustainable fashion pieces for both men and women. In addition to their flagship store in Hanoi, they sell their collections online through their website, across social media platforms, and at some partner boutiques in the USA, Korea, and Germany.

<https://kilomet109.com/home/>³¹

From Traditions to Circular Value Chains

The starting point for Kilomet109 was discovering that the traditional way of producing textiles in Vietnam was incredibly eco-friendly and could show the world an alternative approach to circular production in fashion. Today, to produce high-end, sustainable garments, Kilomet109 works with organic fiber, traditional vegetable dyeing techniques, and 37 artisans, representing five different artisan communities in Vietnam. These communities, each of which represents one of 54 Vietnamese ethnic groups, produce the sustainable textiles used in the collections. Each artisan community brings the mastery of a different set of traditional textile techniques and skills that the company incorporates into their collections. Those techniques include, but are not limited to, natural dyeing (indigo, yam root, lac beetle resin, ebony fruit, etc.), batik drawing, beeswax fabric calendaring, silk/cotton/hemp weaving, and hand embroidery. The products feature innovative details such as flexible panels, folds, hoods, detachable scarves, and pleats, making garments usable in different ways.

Fully controlled local sourcing

Kilomet109's entire production chain is locally sourced. They participate directly in each aspect of the production of their clothes, from planting seeds (cotton, hemp, indigo), growing fibers, and harvesting natural dyes, all the way to the production of the final textiles and fashion pieces at their design studio in Hanoi. As such, they maintain full control and visibility of each step in the value chain used in the production of their clothes.



³¹ All of the information contained in the present publication has been acquired through the company's official website and other public sources.

Impacts and Added Value

Since its establishment, Kilomet109 has been a 100% independently owned and self-funded business. It is profitable and looks for new financing options for further growth. Kilomet109 is expected to expand their retail presence in Vietnam and potentially abroad. With this business, Kilomet109 has created a new business area for local artisans, creating value out of their traditional capabilities.

Using only locally produced, natural fibers and fully avoiding harmful chemicals at every phase, Kilomet109 minimizes its environmental footprint compared to impacts associated with a standard product's material extraction, production, distribution, and waste management processes. Their production is resource-efficient in that they only produce as much as they need, and generate little to no waste or excess inventory.

Kilomet109 has created jobs for 45 people, including company staff and local artisans. They pay the artisans and employees above-market rates, providing a livable wage and a safe work environment. 37 of the 45 people are women. They also plan to add more staff in the coming year. In addition, Kilomet109 helps preserve Vietnam's culture, using contemporary design to innovate fashion pieces that help to raise the value of traditional Vietnamese craftsmanship.

One Square Meter – Turkey

One Square Meter was founded in 2016 in Istanbul, Turkey, by two founders that currently manage the business. It is a slow fashion brand, and their collections include garments and bags. The company initially produced bags printed with a woodblock print technique and later expanded their product line. They make both domestic and international sales, with 90% being domestic. Their fabric suppliers are the well-known fabric producers of Turkey, in addition to local fabric producers that use natural fibers. Their target segment is mainly women between the ages of 23 and 55.

<https://onesquaremeter.co/>

A Sustainable and Slow Fashion Approach

One Square Meter uses eco-friendly materials and a pre-ordering system to avoid excess production. The entire design and production process is carried out in-house. One Square Meter uses fabric made with natural fibers and eco-friendly dyes as well as their modern interpretation of a traditional woodblock print technique, to obtain unique and beautiful prints. All the collections they produce include basic, multifunctional, and universal pieces. Taking a stand against fast consumption and fast fashion, One Square Meter aims to produce valuable collections that are a pleasure to wear for years. They aim to make their production process transparent so that consumers can find the answer to their question: “Who is producing my garments?” One of the key issues in the business model is sourcing high-quality fabric, which requires One Square Meter to maintain relationships with existing suppliers and find new sources.

A pre-order system

Using their pre-order system, the company does not create stock but produces only to meet orders. This way they can keep their pricing under a certain level, since they do not need to pass the costs of mass production on to the customer. As such, they create patterns for all sizes and produce a single garment from each model based on the pre-orders made online. These orders influence production estimates and plans, which makes efficient use of materials.



Impacts and Added Value

One Square Meter is a small business which has seen a return on their investment and makes a profit.

In using natural fiber and a pre-order system that prevents overproduction, One Square Meter minimizes its environmental footprint compared to impacts associated with a standard product's material extraction, production, distribution, and waste management processes. A zero-waste approach to production also minimizes waste.

One Square Meter is among the companies that raise awareness of sustainable and slow fashion.



4.

**The future
of fashion
in the South
Mediterranean
is circular**



The southern Mediterranean region plays a key role in the global fashion chains as it is one of the most important clothing production hubs. At the same time, it is becoming a major market for brands due to increasing clothing purchases by consumers. However, the linear value chains of fast fashion generate many environmental hotspots in its life cycle due to the high use of materials and water, as well as a large number of social impacts.

Governments, consumers, and companies have started questioning the functioning of the industry and this is opening the way for the transformation of the southern Mediterranean fashion sector towards sustainability. The adoption of circular business strategies is of the essence for this transformation as they open up new opportunities that can be exploited by entrepreneurs and innovators through the creation of circular business models or the transformation of existing ones into circularity.

To learn more about these new circular business opportunities, we have examined five circular business strategies and ten circular business models within the fashion sector. Based on the SCP/RAC's Green Business Canvas Development Methodology, we've analyzed each business model including the economic, environmental and social positive impacts. Then, we have examined the potential of applicability of these business models in South Mediterranean countries from both the perspectives of businesses and consumers. To that end, we have talked with 27 businesses and five experts from Mediterranean countries and two Turkish business organizations.

As a result, we've seen that there are a wide range of drivers and opportunities associated with these business models in addition to challenges and barriers that need to be considered extensively. Major factors affecting the implementation of business models in the South Mediterranean countries have been classified under certain categories.

DRIVERS and OPPORTUNITIES

- A. Increasing demand for sustainable clothing fostering industry transformation:**
Increasing consumer demand for lower-cost and flexible options; increasing interest in resale and rental markets, especially the potential in young people for adopting more sustainable ways to dress and shop.
- B. Mediterranean cultural traits and existing capacities enabling circular production:**
Traditions, traditional capabilities and vocations for certain business models; existence of relevant raw materials, infrastructure and similar businesses.
- C. High potential for waste reduction and for obtaining economic benefits:**
High amount of industrial wastes available and high costs associated with their management; lower technological needs and lower investment costs for some business models; resiliency against fluctuating material and production costs; possibility of generating additional revenues.
- D. High potential for business/market creation and expansion:**
Business creation opportunities due to increased demand for circular expertise, services and products; international brands&retailers' demands and targets for more circular value chains and extended producer responsibilities; potential for creating social businesses.
- E. Increased business competitiveness and reputation:**
Opportunity to improve company competitiveness and reputation; creation of competitive advantages.
- F. Policies and programs promoting the transition to a circular economic model:**
Increase in new legislation; national and international programs supporting circularity.

CHALLENGES and BARRIERS

- A. Immature local markets, which slow the demand for sustainable products:**
growing middle class that want to exercise their purchase power; risks associated with market acceptance, consumer trust and perception, and the dominance of fast fashion habits; requirement of awareness rising, mindset shift and behavior change .
- B. Lack of skills, which slows the circular transition:**
Lack of human resource and specific capabilities; capacity needed for eco-design, manufacturing, R&D and innovation.
- C. Supply and demand constraints on sustainable materials, which hinder the offer:**
Suppliers' limited ability to provide sustainable inputs on a continuous basis and at stable prices, including inventories of clothes for resale and rental businesses; low interest from garment producers in using alternative materials and in mainstreaming the use of unblended and recycled fabrics.
- D. The need for infrastructure, technology, and investments that prevents the implementation of certain business models:**
Insufficient collection-sorting-recycling infrastructures and technologies; investments needed for certain technologies and equipment; requirements for outsourced activities including logistics, maintenance, cleaning etc.
- E. Communication challenges hindering access to markets:**
Challenges in communicating the value and benefits of slow fashion, circular design and circular practices and inputs, as well as in communicating the business models.
- F. Limited government support for the creation of circular businesses:**
Insufficient incentives, financial aids, and permit and license requirements for the launching of green businesses; lack of regulations for the establishment of the Extended Producer Responsibility.

In the South Mediterranean countries, it is envisaged that young people's potential for adopting more sustainable forms of dressing and shopping as well as consumer demand for lower-cost and flexible options will be among the major factors promoting circular businesses. Increasing interest in resale and rental markets will be creating new business opportunities in these areas. In addition to local and traditional strengths, the expansion of international markets for sustainable and circular products as well as international brands and retailers' demands and targets for circularity have significant effects as well.

On the other hand, suppliers' limited ability to provide sustainable inputs, the higher or fluctuating prices for sustainable/certified inputs, and the difficulty of finding appropriate sources on a continuous basis all pose challenges for several business models. Immature local markets and the demand for sustainable products and materials as well as the risks associated with market acceptance, consumer trust and perception need to be

taken into account. Hence, the dominance of fast fashion habits and the need for raising awareness, mindset shifts and behavior changes should also be borne in mind when shaping circular businesses in the South Mediterranean countries.

While there is great potential for applying circular strategies and business models, we have also seen that there are many barriers and challenges. In order to overcome them, policy support becomes quite significant. Stakeholders in the South Mediterranean countries, especially those from private sector, emphasize that current government support is insufficient. Hence, regulatory measures as well as incentives and financial aids should be implemented. Collaborative activities involving the private sector, universities, NGOs and public organizations such as municipalities are also required. Taking account of the cross-border value chains, international programs and collaborations are of the essence as well.

Based on all analyses, it is deduced that in the South Mediterranean, circular business models that can be implemented in the relatively shorter term based on existing capacity and infrastructure are as follows:

- Cleaner, resource-efficient, and zero-waste production.
- Upcycling.
- Repairing and upgrading.
- Reselling.
- Rental/leasing and subscription.

Other business models that are listed below, are expected to become widespread in the long term, as they require more extensive capacity building activities, strong design capabilities, investments and technologies as well as certified and traceable inputs and value chains:

- Design for disassembly, reassembly and recycling.
- Collection and recycling.
- Design for durability, long lasting and modularity.
- Value chains driven by alternative, low-impact fibers or recycled materials .
- Slow fashion in full control of the value chains.

Table 5:
Drivers and opportunities affecting the implementation of circular business models in the South Mediterranean countries.

		Drivers and Opportunities				
Strategy	Business Model	A. Increasing demand for sustainable clothing fostering industry transformation	B. Mediterranean cultural traits and existing capacities enabling circular production	C. High potential for waste reduction and for obtaining economic benefits	D. High potential for business/market creation and expansion	E. Increased business competitiveness and reputation
1. Prevent pollution and save resources	Cleaner, resource-efficient, and zero-waste production			✓	✓	✓
2. Recover resources after disposal	Design for disassembly, reassembly and recycling		✓	✓	✓	✓
	Collection and recycling		✓	✓	✓	
	Upcycling		✓		✓	
3. Extend resource use and reduce disposal	Design for durability, long lasting and modularity	✓	✓	✓	✓	✓
	Repairing and upgrading	✓	✓	✓	✓	✓
	Reselling	✓	✓	✓		
4. Increase resource utilization rate	Rental/leasing and subscription	✓	✓	✓		✓
5. Shift to circular supplies and renewable resources	Value chains driven by alternative, low-impact fibers or recycled materials		✓		✓	✓
	Slow fashion in full control of the value chains		✓	✓	✓	✓

SCP/RAC, through SwitchMed and other initiatives, promotes circular innovation within the fashion sector by supporting SMEs in solving their circular challenges through open innovation activities as well as providing capacity building and access to financing and markets for green entrepreneurs. If you are an SME, green entrepreneur, policy maker or organisation interested in building a circular fashion sector and you are looking for support, you can contact us at networking.switchmed@scprac.org

BCSD Turkey contributes to a better understanding, adoption and implementation of a circular economy in Turkey through the Turkey Circular Economy Platform. Platform members can benefit from different services and activities aimed at accelerating Turkey's transition to a circular economy across all sectors including fashion. Details are available at <https://donguselekonmiplatformu.com/en/>

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