

STAGE OF TEXTILE RECYCLE WASTE IN ROMANIA

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Abstract: Aim of this article is to examine the stage of textile recycle waste in Romania. For this purpose were analyzed the main sources of textile waste from Romania (industry of manufacture of textiles, wearing apparel, leather and related products, imports of textiles, clothing and footwear and imports of second hand clothings) and also evolution of the quantity of textile waste in Romania. The benefits (economic and environmental) of the collection and recycling of waste and the legislation on the waste management, have determined the diversification and increasing the number and the capacity of recovery and disposal of waste in Romania. We found the most textile waste in Romania was deposited in deposits onto or into land, in the proportion of 18.51%. This proportion is under the EU average of 34.03%, but is much higher than in other European country. Also, has been an increase in the number of incinerators, in the last years. With all of this, the interest in textile waste management in Romania is far from being to the level of European, where are associations who dealing with the collection and recycling of textiles and is achieved a selective collection of textile waste in the points especially designed for this thing. The information for this paper was gathered from literature, from the EUROSTAT database and INSSE database analysis and by Internet.

Key words: reused, recycled, textile, waste, disposal

1. INTRODUCTION

Textile waste called in time as MTS (Secondary Textiles), MR (recyclable materials) and MTR (Reusable Textiles) come primarily from textile manufacturing processes (spinning, yarn preparatory, weaving, knitting, chemical finishing), manufacturing, processing in other industries (chemical fiber plants or units processing the textiles) or as a result of physical and moral wear after some time of using textiles. [1]

According to the Council for Textile Recycling, textile waste can be classified as either pre-consumer or post-consumer waste. Pre-consumer textile waste consists of “by-product materials from the textile, fibber and cotton industries” and post-consumer waste is “any type of garment or household article made from manufactured textiles that the owner no longer needs and decides to discard”.

The waste resulting in the manufacturing processes for textile subsectors, (resulting from spinning phases, yarn waste from spinning mills, mills, knitting, weaving heads and strips from cutting mills, patches from cutting phases, etc.) can be reintroduced into the manufacturing process and can be used to obtain vicuna yarn, unwoven textiles, cotton upholstery for furniture and cars, insulating materials, geotextiles, etc. Recoverable waste may be subject to cutting operations, unweaving and defiberizing in order to salvage fibers from them. Further, by working with appropriate classic/unconventional traditional technologies, these fibers can be used to make protective clothing, technical textiles and thermal and phonetic insulating materials, building materials, textile composites (automotive, naval, construction industry), geotextiles, agro textiles, products for environmental protection. It is estimated that in each year 750,000 tons of this waste is recycled into new raw materials for the automotive, furniture, mattress, coarse yarn, home furnishings, paper and other

industries. Through the efforts of this industry approximately 75 percent of the pre-consumer textile waste that is generated is diverted from our landfills and recycled. [2]

Because today, clothing not only responds to practical needs; fashion has become a form of self-expression and the sheer volume and variety of textile products available on the market have reached unprecedented levels. The textile industry is a \$1 trillion worldwide business. [3] But textiles are not used just for clothes - they are use also in households, hospitals, workplaces, shops, constructions, vehicles etc., in the form of cleaning materials, interior textiles, packings, leisure equipment, protective equipment and so on. All this type of article, made of some manufactured textile that the owner no longer needs and decides to discard can given to charities but more typically are disposed of into the trash and end up in municipal landfills. The main reasons for what the garments are discarded are: lower quality, new fashion trend or clothes were bought for one specific occasion. [4]

If these products are collected then they can be reused and recycled. According to the Council for Textile Recycling once sorted, the used clothing and textiles are reused and recycled in one of the following manners [5]:

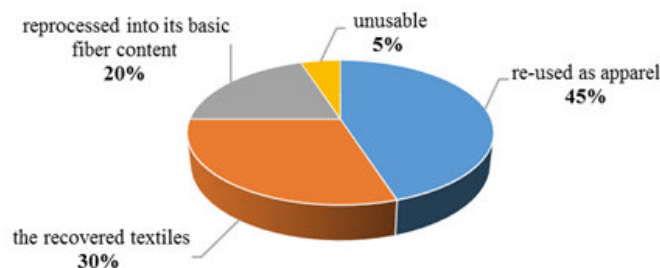


Fig. 1: The life cycle of secondhand clothing

As it can be seen, 45% is re-used as apparel. These items are generally processed into large bales that are then sold in the U.S. to the secondhand clothing industry or are exported to emerging market nations where demand for top quality secondhand clothing is particularly high. 30% of the recovered textiles are cut into wiping rags or polishing cloths that are then used in commercial and industrial settings and 20% is reprocessed into its basic fiber content - the fibers are then remanufactured to create furniture stuffing, upholstery, home insulation, automobile sound-proofing, carpet padding, building materials and various other products. The remainder of the 5% is unusable. This category includes wet textiles, moldy textiles or contaminated with solvents, who are not fit for recycling, and are discarded.

The economists and environmentalists studies on technical and economic requirement for sustainability revealed the need for increasing waste prevention and recycling. A few reasons why recycling is important are: recycling programs cost fewer than waste disposal programs; the high water, energy, manufacture consume makes it much cheaper to recycle than to produce some new textile products; recycling can be financially rewarding, people can receive money for turning in certain recyclable products; recycling creates jobs; recycling conserves natural resources such as water oil and natural gas; recycling prevents the destruction of natural habitats etc. [6]

2. COLLECTION, RECYCLING AND TREATMENT OF TEXTILE WASTE IN ROMANIA

Collection, recycling and waste management is a priority for Romania and is found in Romania's commitments towards EU.

The waste regime in Romania is regulated by the Emergency Ordinance no. 78/2000, subsequently amended and supplemented. Law 27 of 2007 is the legislative act which obliges Romanians to sort waste. The problem is that so far has not been set up the selective collection system in the entire country. Resolution no. 870/2013 regarding the approval of National Waste Management Strategy 2014-2020, provides that the waste which do not comply recycling standards, but they have the corresponding calorific value, one of them being the textiles, can be and should be subject to recovery or thermal treatment with energy recovery installations appropriately equipped.

Latest official statistics show that in Romania were generated around 363,315 million tonnes of waste, of which 99.4% are non-hazardous and 0.6% hazardous waste. From these, 18,774 tonnes

are textile waste. Much of these, 76.43% are generated by industry of manufacture of textiles, wearing apparel, leather and related products. [7] At these wastes is added the textile waste generated by other industries and households.

The evolution at the last years, of the quantity of textile waste generated by the Romanian industry of manufacture of textiles, wearing apparel, leather and related products is shown in figure 2.

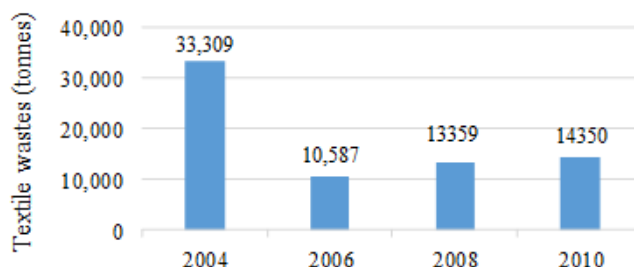


Fig. 2: The evolution of the quantity of textile waste generated by the Romanian industry of manufacture of textiles, wearing apparel, leather and related products

Decreasing evolution of waste generated by industry of manufacturing textiles, wearing apparel, leather and related products, was determined mostly by the decreasing of the number of companies from this Romanian industry, as can be seen in Table 1. [7]

Table 1: Evolution of the number of enterprises from Romanian industry of manufacture of textiles, wearing apparel, leather and related products

	2008	2009	2010	2011
Manufacture of textiles	1,770	1,631	1,499	1,317
Manufacture of leather and related products	1,938	1,759	1,572	1,483
Manufacture of wearing apparel	5,867	5,313	4,480	4,111

In the same time, on the Romanian market is an increase in imports of textiles, clothing and footwear which will increase, sooner or later, quantity of products which will be recycled. The evolution of imports of textile, show that the value of them increased 1.7 times compared to 2000, reaching at about 4 billion euros in 2013. [8]

Table 2: Romanian textiles, clothing and footwear import (millions EURO)

Import (millions EURO)	2000	2004	2008	2013	Evolution 2013/2000
Textiles, clothing and footwear	2,369	3,361	3,717	4,086	1,7

Talking about the textile products in Romania have to we mention and imports of second hand clothes, whose evolution in recent years is one ascending both the quantity and the value level. The evolution of imports of second hand clothes show the growth of these imports with more than 20 million kilograms in 2011 compared to 2008.

Table 3: Romanian second hand clothes import (2008-2011)

	Trade Value (USD)	Trade Quantity (kg)
2008	22 031 302	29 319 631
2009	24 361 280	34 095 462
2010	35 526 741	40 337 255
2011	34 873 602	49 777 741

The benefits (economic and environmental) of the collection and waste recycling and the legislation on the waste management, who was adopted in the EU, have determined the diversification and increasing the number and capacity of recovery and disposal facilities.

From this point of view, in 2010, between the EU member countries stands out United Kingdom with 20,388 and Germany with 11,370 recovery units other than energy recovery, Netherlands with most units of incineration / energy recovery – 2,329. Regarding the hazardous waste storage at the first place in EU is Bulgaria who has 189 landfill for hazardous waste. [7]

In Romania, the number and the types of recovery and disposal of waste are presented in

Table 4. [7]

Table 4: *The number and the types of recovery and disposal of waste, in Romania*

Incineration / energy recovery (R1)	72
Recovery other than energy recovery	112
Incineration / disposal (D10)	15
Deposit onto or into land	145
Landfill for hazardous waste	8
Landfill for non-hazardous waste	137

The textile waste in Romania (in 2010), are deposited in the proportion of 18.51% in deposits onto or into land. This proportion is under the EU average of 34.03%, but is much higher than in France 0.708%, in Italy 1.156%, in Netherlands 1.964 %, in United Kingdom 3.351% or 0.061% in Germany. It can mentioned that there is an increase in the number of incinerators, compared to 2011, when there were only seven centers incineration (Alesd, Campulung, Bicaz, Deva, Fieni, Hoghiz and Medgidia). [9]

Alongside the firms whose the main object of activity is the recovery and disposal of waste in the campaign of textile waste collection came the sellers textile companies. For example the Swedish retailer H & M has started a campaign to recycle old clothes in all its stores in the 48 countries where it is present. Customers can bring used clothing in the stores H & M and they will receive a voucher in order to buy new clothes. Second hand clothes will be used later to produce other clothes, rags or cleaning materials or insulation materials in the automotive industry.

3. CONCLUSION

The increase the consumption of textile products and clothing, reflected of the import growth of the textile, clothing and footwear and the import growth of second hand clothes, and knowing the economic benefits that can be obtained by collecting and recycling have determined the growth the number of firms involved in the recovery and recycling textile, in Romania.

Joining the Romanian at the EU and adopting EU legislation on waste management and recycling have contributed to the growth efforts and interest in the issues raised by the waste in general and the textile waste in particular.

The interest in textile waste management in Romania is far from being to the level of European countries in which besides the fact that there are associations that deal particular for collection and recycling of textile and garment , this are involved in various awareness campaigns and educate students on the importance of population and collecting useless clothes (SMART-Secondary Materials and Recycled Textiles, Council for Textile Recycling, Textiles Recycling Association in UK, American Reusable Textile Association (ARTA), European Textile Recycling Alliance, abbreviated as ETRA, De Vereniging Herwinning TEXTIEL (VHT) etc.) is performed and selective collection of textile waste in specially designated points for this.

REFERENCES

- [1] Zamfir, Maria & colab., “*Deșeuri textile - Tehnologii de prelucrare. Tehnologii de recuperare.Domenii de utilizare*”, Ed. Performantica, Iași, 2007
- [2] Darrel R.,”*Post-consumer waste and Pre-consumer waste: What exactly is the difference?*, 2007, [Online]. Available: http://www.amazines.com/article_detail.cfm?articleid=363930
- [3] <http://www.bir.org/industry/textiles/2007>, accessed in 10.03.2014
- [4] Bristwistle, G., Moore, C.M., “*Fashion clothing – where does it all end up?*”, International Journal of Retail & Distribution Management, 35, 2007, pp. 210-216.
- [5] “*The Life Cycle of Secondhand Clothing*” [Online]. Available: <http://www.wearonaterecycle.org/about/clothing-life-cycle.html>
- [6] Sunhilde Cuc, Milorad Vidovic, “*Environmental Sustainability through Clothing Recycling*” Operations and Supply Chain Management, Vol. 4, No. 2/3, 2011, pp. 108-115
- [7] <http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/data/database>, accessed in 10.03.2014
- [8] <http://www.insse.ro>, accessed in 10.03.2014
- [9] Sunhilde Cuc, “*Environmental and Socioeconomic Sustainability Through Textile Recycling*”, 4TH TEXTEH INTERNATIONAL CONFERENCE, Bucharest, Romania, June 23-24, 2011