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Expert Network on Textile Recycling

"STRATEGIC AGENDA ON TEXTILE WASTE MANAGEMENT AND RECYCLING"

CONTENT

1. Regional Report on Textile Waste Management and Recycling

The **Strategic Agenda** of ENTeR is jointly defined on the basis of problems which are relevant for the participating regions. It provides a **common vision** and sets **objectives** and **priorities** in a mid- to long-term perspective. The formulation of our transnational and regional strategy is carried out with involvement of relevant stakeholders (also targeting the policy level).

The elaboration of the SA was done in two phases, the desk phase and the field phase.

In the **desk phase** the state of the art of textile waste management and recycling in each partner region (Italy – Lombardy, Germany – Saxony, Poland – Lodzkie Region, Czech Republic, and Hungary) was studied and summarized in specific regional reports. Furthermore, the state of the art on textile waste management and recycling in other Central Europe (CE) regions (Austria, Slovenia, Slovakia and Croatia) was done. The regional reports show the legal, social and technical aspects concerning textile waste management. The strengths, weaknesses, opportunities and threats of the partner regions regarding textile waste management were elaborated and prepared in a SWOT analysis form, to identify individual and joint problems but also solution strategies.

In the **field phase** relevant stakeholders in the individual regions were interviewed. Questionnaires on the current situation of textile waste management were prepared and distributed among companies and industrial partners in the textile branch. The aim was to get a direct feedback from companies and stakeholders and to complement the desk phase studies with the experience and the handling of the current textile waste situation from everyday practice. Additionally mutual visits to all partner regions were done. During this visit workshops on circular economy were organized. Local operators in the field of textile waste management were invited or visited and informed about the project ENTeR and its main objectives.

The result of the desk phase and the field phase is a **broad overview** of project partner's mutual knowledge about the characteristics of materials and resources, the existing technical and regulatory context, already developed solutions and experiences.

Based on these data the **Strategic Agenda** was prepared. Specific needs and unsolved problems in terms of textile waste management in the partner regions could be identified and are the basis for action lines deriving from the outcomes of the studies. The action lines shall represent the most appropriate ways to support textile and clothing companies in their waste management and to strengthen the expert network on textile recycling in Central Europe.

1.1 SUMMARY OF REGIONAL ANALYSIS CZECH REPUBLIC

Number of interviews/questionnaires: 22

Findings:

At the moment
- municipal waste management system available – textile waste is not sorted and disposed with other municipal waste
- collection of textiles and outworn clothing organised by private companies/charities
- collected textiles sorted according to quality and offered for further use (charity), sold in second-hand shops, forwarded to third world countries, recycled and the unusable share disposed
- textiles which cannot be redistributed or recycled are usually used for energy recovery or disposed to landfills
- textile recycling is operated on the private commercial basis
- companies already reuse their textile waste internally
- companies look individually for external business partners

Technology
- mechanical processing like cutting and tearing
- obtained textile material is usually used for manufacturing of nonwovens or for production of cleaning materials, various fillings, insulation material, parts for automotive industry etc.

Challenges
- lack of opportunities for reuse of waste coming from technical textiles caused especially by the technical character of such textiles (heavy coated or laminated, composites with latex, paper etc.)

SWOT analysis:

Strengths	Weaknesses
• regular waste generation • sorting • large quantities of waste • mono-fraction or valuable waste	• long distances to the recycling company • poor quality of waste • low quantities of waste
Opportunities	**Threats**
• re-use of textile waste in new products • offering waste via a recycling exchange platform • internal recycling • investments in new technologies, R&D activities	• the required investments needed for solving • lack of market for recycled products • contamination of textile waste with chemicals

1.2 SUMMARY OF REGIONAL ANALYSIS HUNGARY

Number of interviews/questionnaires: 26

Findings:

At the moment
- Hungarian companies are looking for solutions to recycle their textile waste as much as possible
- no separated collection of textiles waste and communal waste; it is handled and transferred as a communal waste – without separation and selection
- most common way the companies handle their waste is send it to disposal in landfills or to incineration
- issue of textile waste management system and recycling is very urgent

Technology
- textile waste recycling technologies are available in Hungary but only in a small range
- mechanical processing as tearing and cutting (Temaforg, TESA)
- the obtained textile material is usually used for manufacturing of non-woven textiles or for production of cleaning materials, various fillings, upholster materials, insulations, geotextiles
- this solution is mostly available only for "simple" textile waste without any heavy chemical treatment (coating, laminating)

Challenges
- need of new technologies related to textile & clothing sector and complicated textile waste
- improvement of waste collection and sorting

SWOT analysis:

Strengths	Weaknesses
• regular waste generation • with large quantities of waste	• no relevant recycling company in the region • no regional waste management system available • lack of recycling knowledge • lack of capital for investment • long distances to the recycling company to find a recycling possibility is very difficult • poor quality and small quantities of the waste • lack of waste utilization possibilities
Opportunities	**Threats**
• offering waste via a recycling exchan-ge platform, together with business partner • search not only in regional but also in interregional level.	• required investments needed for problem solving • lack of market for recycled products • high processing co

1.3 SUMMARY OF REGIONAL ANALYSIS ITALY

Number of interviews/questionnaires: 13

Findings:

At the moment

- textile companies are increasingly oriented towards environment
- subjects: sustainability, circular economy and new materials
- the waste production coming from provincial textile sector for 2016 is about 19.510 tonnes/year, where 87.7% of derives from textile industry, while 13.3% from production processes of clothing and articles in leather and fur
- large quantities of liquids deriving from tanning activities, such as sludge coming from on-site treatment of effluents and tanned leather (scraps, waste, scraps, polishing powders), containing chromium

Technology

The efficiency, sustainability and competitiveness of the production system depend on the ability to operate in innovative and technologically advanced processes in order to gain advantages in the design, processing and assembly of products and components. One of the major competitive factors, in the textile production sector, is identified in the development of technologies for "Sustainable Manufacturing".
At environmental and economic level, we highlight the technologies that allow the implementation of sustainable "end-of-life" processes:

- Technologies and design technics for automatic product disassembling;
- Technologies for the pre-treatment of solid products, liquid and gaseous substances aimed at re-use and recycling;
- Technologies for the valorization through reuse, re-manufacturing and recycling of solid, liquid and gaseous products from end of life cycle and production waste.

Challenges

- increase the market acceptance for recycled products (social/cultural barrier)
- overcome the lack of technological know-how
- decrease in bureaucracy and simplification in administration
- establishment of recycling plants for the strongest sectors on the territory

SWOT analysis:

Strengths

- well-established sector in the Lombardy region both in terms of number of companies and employees, as well as growing in annual turnover (+ 2.4%); in 2017 the sector generated roughly 13 billion € in export (+3.6% with respect to 2016, source ISTAT);
- presence of associative and industrial product groups that lead companies to a more sustainable production (Confindustria);
- constant support and continuous involvement of public administrations and stakeholders to lead and encourage environmental sustainability in the textile sector;
- interest of companies on environmental issues also due to the request by customers of products with a reduced environmental impact or deriving from recycling processes;
- quick response and flexibility of processes and products, achieved through new and innovating technologies.

Weaknesses

- high number of disconnected SMEs with individually quantities of waste too small for a continuous supply for new recycling possibilities;
- negative dynamics of domestic demand, in terms of business-to-business and sell-out demand;
- staff often poorly prepared (insufficient academic preparation) on environmental issues or lack of personnel dedicated to sustainability;
- reduced availability of investments for research of green alternatives in production;
- difficult interpretation of legislation on circulation of waste destined for recycling

Opportunities

- development of projects for the involvement of companies in this sector;
- dialogue between Public Administrations and stakeholders and other actors in the sector to identify needs and to break down the barriers that hinder the transition to a circular economy and recycling of materials;
- involvement of design schools and start-up companies for the development of new materials or technologies aimed at reducing the environmental footprint of the textile supply chain;
- implementation of specific university courses on LCA (through development of specific software) for the promotion of transition from Linear Economy to Circular Economy;
- development of specialized databases and exchange platforms for information, materials and technologies;
- approach to PEF (Product Environmental Footprint) methodology;
- financial contribution issued by the UE and Piano Nazionale Industria 4.0.

Threats

- purchasing policies based only on product cost without considering environmental costs;
- textile trends, such as: fast fashion, low cost products;
- low competitiveness with foreign production (mainly Far East);
- customers' cultural barriers in accepting products deriving from recycling chain;
- regulatory barriers, administrative immobilization in the implementation of new European provisions within the Circular Economy;
- many competitors operate in contexts with fewer environmental restrictions.

1.4 SUMMARY OF REGIONAL ANALYSIS POLAND

Number of interviews/questionnaires: 13

Findings:

At the moment

- textile waste recycling in Poland is complex and expensive
- technologies for textile recycling are very expensive
- high effort in registration and processing (separation, storage, logistics)
- lack of available technological or technical solutions
- textile recycling is economically not attractive
- no structural support of the government, possibilities of financial support from EU or national funds
- companies, which achieved significant progress in the field of textile
- waste management, made it with their own financial resources

Technology

- technologies that allow textile waste management in 100% are very expensive
- lack of available technological or technical solutions and too much effort in registration and processing (separation, storage, logistics).

Challenges

- continued growth of the textile waste stream is not in correlation with the development of the collection system and the construction of installations for textile waste processing
- problem with textile waste management in Poland remains still unresolved
- problem of textile waste in Poland is global and requires substantial funds and regulation
- urgent need of finding recycling possibilities

SWOT analysis:

Strengths

- initiatives are taken to prevent waste generation.
- one of the basic activities in waste prevention is raising the environmental awareness of the Region's inhabitants through educational campaigns
- the strong point of the region is its location in the central part of Poland, and the biggest advantage is location in the transit and transport node.

Weaknesses

- insufficient infrastructure serving integrated waste management.
- inadequate number of installations for processing municipal waste
- a large number of landfills that have not yet been reclaimed but are excluded from use and low efficiency of selective municipal waste collection
- strong road infrastructure has a major impact on other industry sectors, including improvement of waste management rationalization
- regular waste generation

Opportunities

- offering waste via a recycling on-line platform
- reuse of textile waste in new products
- textile dust for alternative fuel production
- market demand for eco-design
- development of waste management system in Lodzkie Region

Threats

- high processing costs of recycling textile waste
- lack of low-costs processing technologies
- inhomogeneous, contaminated waste require expensive analysis
- lack of available support for investment funding (for the purchase of technologies and machines)

1.5 SUMMARY OF REGIONAL ANALYSIS SAXONY

Number of interviews/questionnaires: 15

Findings:

At the moment

- in Germany, 1.5 to 1.9 million tonnes of textile waste (old textiles and textile production waste) are produced each year
- well-organised clothing collection system→large part of textile waste can be reused
- technological solutions to treat conventional textile waste are sufficiently available and state-of-the art.
- nevertheless 300,000 tonnes of textile waste are incinerated or sent to landfills
- volume of textile waste continues to grow
- transition from clothing textiles to technical textiles→smart textiles with electronics, high-performance textiles with special coatings or finishes, composite materials, etc.

Technology

- waste from textile production and the clothing industry can be processed very well with tearing, cutting, carding, processing of individual fibres, re-use in nonwovens, insulation materials, automotive industry, etc.

Challenges

- structural changes of the national and regional T&C sector from the classical production towards the production of technical textiles are ongoing
- textile waste is changing concerning the kinds of raw materials (high performance fibres), the composition of textile fabrics, the surface quality (functional coatings), use of electronic parts in smart textiles, etc.
- recycling industry is not in a position to successfully process waste from technical textiles (such as composites, textile-based components, smart textiles) using the current state of the art technologies
- new methods/approaches to treat novel materials are required increase of n
- new materials lead to a great variety of types of waste with small amounts of waste. Important is to channel the waste streams and build up networks for waste management at interregional level (for instance via a database)

SWOT analysis:

Strengths

- varietal purity of textile waste
- separated waste collection (sorting)
- high amounts of waste available
- regular volume available
- textile waste is valuable (intrinsic value)
- short distances to disposal companies

Weaknesses

- non-defined waste
- only small amounts are available
- no regular volume available
- poor quality waste
- long distances to the recycling company

Opportunities

- reutilization of waste in the own company (production cycle)
- reutilization in new products (own or other company
- offering waste via a recycling platform
- investment in novel technologies / applying of funding
- activities in research and development (R&D)

Threats

- high expenses for treatment and re-processing
- investments to solve the waste problems required (additional costs)
- missing market acceptance for recycled products
- waste is contaminated (polluted), reutilization is not possible
- legal rules / guidelines (for instance REACH or special certificates)

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ENTeR – Expert Network on Textile Recycling

ENTeR works in five central European countries that are involved in the textile business, to promote innovative solutions for waste management that will result in a circular economy approach to making textiles.

The project will help to accelerate collaboration among the involved textile territories, promoting a joint offer of innovative services by the main local research centres and business associations ("virtual centre"), involving also public stakeholders in defining a strategic agenda and related action plan, in order to link and drive the circular economy consideration and strategic actions.

The approach of the proposal and the cooperation between the partners are oriented to the management and optimization of waste, in a Life Cycle Design (or Ecodesign) perspective