Through an innovative recycling approach and a synthesis of expertise, RESYNTEX will transform non-wearable textile waste into secondary raw materials. New and integrated processing technologies will increase resource efficiency while reducing the environmental impact of end-products by replacing virgin material feedstock.

**OBJECTIVES**

1. Create a strategic design for a complete value chain from textile waste collection to new feedstock for chemicals and industry
2. Improve collection approaches while increasing social involvement and public awareness of textile waste
3. Enable traceability and credibility of waste processing using data aggregation for life cycle analysis
4. Develop innovative business models for the chemical and textile industries
5. Demonstrate a complete reprocessing line for basic textile components

**NEW TECHNOLOGY AND PROCESSES**

Using industrial symbiosis, RESYNTEX will utilise post-consumer textile materials in pure and blended form to produce chemical feedstock through innovative chemical and biochemical processes.

**WHY?**

- Help industry to reduce environmental impact
- Create new chemical feedstock and state-of-the-art processes
- Address public demand for more sustainable products
- Increase public awareness and enable better recycling
- Inform governing bodies and policymakers on circular economy

**CREATING VALUE**

RESYNTEX looks to replace:

- Ammonia with value-added chemicals based on polyamide oligomers of textile origin
- Phenol-formaldehyde with protein-based components in adhesives
- Petrochemicals for packaging with recycled terephthalic acid recovered from polyester
- Fossil-based transportation fuels with bio-based ethanol

**RESYNTEX SUPPORTS SPIRE’S KEY ACTIONS**

- Optimal valorisation of waste, residue streams and recycled end-of-life materials, such as non-reusable waste textiles
- Optimal and integrated re-use of water
- Energy savings via resource management concepts

**WORK PACKAGES**

1. Design & scenarios
2. Citizen behaviour & collection design
3. Sorting & pre-treatment
4. Process optimisation
5. Industrial applications
6. Process design & analysis
7. Demonstration of concept
8. Assessment of scenarios
9. Exploitation, dissemination & communication
10. Project management
BUILDING ON EXPERIENCE

Project partners include industrial associations, businesses, SMEs and research institutes working together as an effective model for the whole value chain.

USING EXISTING RESOURCES

A report by Oakdene Hollins demonstrates how RESYNTEX could help consume residual textile waste streams produced by EU Member States. This share of waste would otherwise be incinerated or landfilled.

<table>
<thead>
<tr>
<th>Waste stream</th>
<th>Total residual waste (million tonnes)</th>
<th>Availability to RESYNTEX</th>
<th>Top 3 Member States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing: in sorters’ residuals</td>
<td>0.08</td>
<td>High</td>
<td>Germany, UK, Belgium</td>
</tr>
<tr>
<td>Clothing: in municipal solid waste</td>
<td>5.80</td>
<td>Low</td>
<td>Germany, Poland, Italy</td>
</tr>
<tr>
<td>Carpets</td>
<td>1.60</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Mattresses</td>
<td>0.30</td>
<td>Medium</td>
<td>Poland, UK, Germany</td>
</tr>
<tr>
<td>Furniture</td>
<td>0.40</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Uniforms</td>
<td>0.08</td>
<td>Medium</td>
<td>Germany, UK, France</td>
</tr>
<tr>
<td>End-of-life vehicles</td>
<td>0.19</td>
<td>Low</td>
<td>UK, France, Italy</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.90</td>
<td>Low</td>
<td>Italy, Germany, Spain</td>
</tr>
<tr>
<td>Total:</td>
<td>9.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ESTIMATES BASED ON THE RESEARCH CONTAINED IN THE MAIN BODY OF THE REPORT BY OAKDENE HOLLINS TITLED, ‘TEXTILE RECYCLING MARKET ANALYSIS’

RESYNTEX has been cited by the European Commission as an innovative step towards textile recycling and its Circular Economy Action Plan. The project has been referenced in the Greenpeace report ‘Fashion at the crossroads’ and the Ellen MacArthur Foundations’ Circular Fibres Initiative.

ABOUT THE PROJECT

Start date: 1 June 2015
Duration: 42 months
Budget: €11 million
Project coordinators: SOEX, IOS
Dissemination and communication: Sustainability Consult

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PARTNERS

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