Recycled Fashion Day 2013

Proceedings

28 January 2013, Rome
The Recycled Fashion Day 2013 was organized in cooperation with and made possible by:

AltaRoma
Embassy of the Kingdom of the Netherlands (Rome, Italy)
Ministry of Infrastructure and the Environment (the Netherlands)
City of Almere
Economic Development Board Almere
Comune di Prato
Modint
Dutch Fashion Foundation
Fondazione per lo Sviluppo Sostenibile
Air France-KLM
REMO
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Recycled Fashion Day 2013, Rome

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Recycled Fashion Day 2013

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28 January 2013, Rome
Introduction

Jaap van Straalen and Antje Melissen, Co-Founders of Foundation Casa della Sinergia

It is the aim of the Foundation Casa della Sinergia to bring together the best of Italy and the Netherlands, by connecting companies, institutions and individuals. In doing so, the foundation focuses on fashion, design and cultural heritage, especially when sustainability issues play an important role. The concept of circular economy is important. Although the idea seems simple, when companies decide to aim their efforts on accomplishing it, they will likely need societal support, both from politicians and consumers alike. Casa della Sinergia creates platforms to render transparent the complex interactions between company goals, government regulations and the behavior of consumers (who act sometimes different from their behavior as concerned citizens). This is especially the case where the circular economy is part of international business, working with national constraints, imposed by regulations and local habits. The Recycled Fashion Day 2013, organized in Rome on 28 January is an example of such a platform in the field of textiles and fashion.

In September 2012, the Mayor of Prato, Roberto Cenni, and the Mayor of Almere, Annemarie Jorritsma, signed a letter of intent to share, improve and develop projects aimed at reusing materials and disseminating good environmental practices. Together, the cities are aiming for a circular economy in textiles: making new textiles out of old textiles and reducing the environmental impact. In his Welcome Speech at the Recycled Fashion Day, H.E. Ambassador Michiel den Hond rightly stresses the fact that sustainability is not just a temporary hype and that the green economy is the future.

This serves a climate in which technical research can contribute to shaping new textiles and fashion, not only creating a circular economy, but also assisting processes in which bearers of garments are involved; an important development, signalized by Valeria Mangani, Vice President of Alta Roma.

A green economy can be thought of as one which is ‘low carbon, resource efficient and socially inclusive’. A circular economy in textiles contributes to a better environment, because less land and water will be used for non-food production. The necessity of a smaller ecological footprint was explained by Raimondo Orsini, director of the Sustainable Development Foundation in Rome. He illustrated the impact of economic growth on the environment and discussed what is needed to stop the excessive negative impact. Creating closed loops is one of the possible solutions to decrease our ecological footprint.

Stimulating an increase in the reuse of textiles covers a variety of challenges, first of all the sorting out of the garments that still can be used, in the Netherlands a field traditionally covered by charity institutions. A second challenge is the recovery of textiles from waste: nearly two-thirds of all the discarded clothes end up in the waste bins and the incinerators: a great loss of good materials. This challenge has to be met if we want to unravel textiles in large quantities. Waste treatment is regulated by the government; the regulations are not always in favor of the concept of the circular economy. But when this area is explored well, a growth in employment and bigger quantities of recyclable materials can be expected. Henk Weysschedé, director of the Economic Development Board of the City of Almere, explains how Almere will contribute to the green economy by taking the responsibility to ‘reduce, reuse and recycle’ as much as possible.

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The Prato district is the heart of Italy's apparel industry, home of the Made in Italy label. Traditionally, Prato is synonymous with quality, style and craftsmanship. Balancing tradition and innovation, the district is now developing a closed loop for the textile industry, in order to meet new environmental demands. In his speech, Roberto Cenni, Mayor of the City of Prato, explains the efforts of the district in branding a sustainable ‘Made in Prato’ label and the development of a ‘recycling culture’.

Another ‘Italian example’ was presented by Martina Hauser of the Italian Ministry of Environment. She discussed the Italian environmental footprint program and more specifically the Italian-Brazilian project ‘Traces’. The project traced the carbon footprint, the social and environmental impact of a number of products made of e-fabric sustainable materials.

Already for many years, individual companies are confronted with demands of sustainability. Many companies developed a CSR strategy, like KLM, as illustrated by Olaf Hoftijzer, commercial director Italy in Air France-KLM. Main issues are of course fuel and food, but KLM experiments with sustainability in a vast area. The company was involved in one of the first attempts to establish a closed loop in the recycling of KLM uniforms (co-financed by the NL Agency of the Dutch Ministry of Economic Affairs). This case is presented during the Recycled Fashion Day: shawls made from KLM uniforms are presented as gifts to the congress participants.

Recycled textiles cannot be turned into fashion without the dedicated creativity and interest of fashion designers and fashion labels. Winners of the Dutch Fashion Awards, Conny Groenewegen and Mattijs van Bergen expressed their interest in using recycled materials during the Recycled Fashion Day. Angelique Westerhof, director of the Dutch Fashion Foundation, stresses the importance of creating laboratories where creative and technicians join forces and research the possibilities of recycled yarns in small and intimate settings. This was underlined by Alessandro Viganò, former brand manager of Armani Jeans, who illustrated several sustainable innovations in the denim industry, reducing the use of water and chemicals in the production process. Branding ‘recycled fashion’ asks for dedicated brand managers.

The afternoon program is dedicated to REMO (Recycle Movement). REMO promotes the recycling of fabrics and creation and sustainable production of recycled goods. The REMO label gives both the consumer and the reseller reliable and transparent information about the use of recycled fibres in the product. In the REMO workshop, all organisations that participate in the realization of REMO – all links in the chain – together presented a closed loop for the recycling of textiles. Texpurium, the Dutch open innovation center for high-value recycling of textiles, developed the REMO key, showing all relevant information about the recycled fibres used, the production history of these fibres, as well as the environmental savings realized. REMO uses part of the EcoTool, developed by Modint, the Dutch trade association for fashion, interior design, carpets and textiles. With the EcoTool, discussed by Peter Koppert, sustainability manager with Modint, reductions in the use of water, CO2 and chemicals can be measured. The REMO key and the EcoTool are important in creating customer awareness.

During the Recycled Fashion Day government officials indicated the importance of the circular economy for the textile industry. Opinion leaders stressed the necessity and the opportunities for international cooperation, especially between Italy and the Netherlands. Best practices and lessons learned showed that first steps have been taken in effectuating a closed loop in reality, from collecting and sorting of textiles, unraveling of textiles, spinning and weaving to the interest in participation of fashion designers and fashion labels.
Welcome speech

H.E. Michiel den Hond, Ambassador of the Kingdom of the Netherlands in Italy

Gentile Signore e Signori,

Un caloroso benvenuto a tutti voi a questo convegno chiamato Recycled Fashion Day durante la importante fashion week capitolina AltaRomAltaModa. È un’interessante iniziativa Italo-Olandese nella realizzazione di soluzioni sostenibili per il recycling nell’industria tessile e il riutilizzo poi dei tessuti nella moda.

Ladies and gentlemen,

Sustainability is not just a temporary hype. Green economy is the future. Through recycling and recovery precious resources are returned to the economic cycle. Both in Italy and in the Netherlands, sustainability is high on the political and economic agenda.

I am very happy to see that during this Recycled Fashion Day a Dutch-Italian initiative is presented in the field of textile recycling and re-use: yet another excellent example of the many forms of cooperation between Italian and Dutch companies and institutions.

The City of Almere in the Netherlands, together with companies from the textile industry and the REMO Recyle Movement, are starting a textile roundabout, contributing to a circular economy. This means, closing the recycle production chain, increasing the recycling rate of textiles, and contributing to sustainable economic growth, including the creation of jobs.

The textile district in Prato has a longstanding tradition in the production of wool yarns and fabrics. The typical production of Prato, carded wool fabrics, is based on recycling used fibers.

Last October in Prato the Mayor of the City of Almere, Mrs. Annemarie Jorritsma, and the Mayor of the City of Prato, Mr. Roberto Cenni, signed a Letter of Intent to start a cooperation between the two cities in the development of sustainable textile recycling. It will entail collecting second hand clothes, sorting and unraveling of these clothes in Almere on the one hand, and spinning, weaving/knitting and finishing in Prato, on the other.

I am pleased to say that today’s meeting is a concrete step forward in the cooperation between these two cities. Today we also discuss the collaboration in sustainable textiles and the important link with sustainable fashion. The Netherlands is becoming more prominent in this field, and I am very happy with the presence of two emerging Dutch designers, who are active in sustainable fashion: Conny Groenewegen and Mattijs van Bergen. And of course I am also pleased to see Ralph Vaessen here, a fantastic designer. And I would like to welcome Angelique Westerhof of the Dutch Fashion Foundation, she is an important engine of Dutch Fashion Promotion.

As you all know, economic and commercial ties between Italy and The Netherlands are very extensive. For my country, Italy is a very important export partner with a total export value of about 22 billion euro. And vice versa Italian products are doing very well in our country, in particular the typical ‘Made in Italy’ products.
I believe that this Recycled Fashion Day initiative is an excellent opportunity to further strengthen our economic ties and it will hopefully lead to even more concrete follow-up activities. After all: combining our strengths is a benefit to both our countries!

I wish you all a very fruitful meeting today! Vi auguro un convegno molto proficuo oggi!

Thank you very much, grazie mille.

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Opening speech

Prof. Valeria Mangani, Vice President AltaRoma, Professor at La Sapienza University in Technological Fabrics and the Quality of Life

To paraphrase Dostoevsky, fashion as synonymous with sublime beauty, will save the world by paving the way to a sort of intercultural mediation that weaves together the warps and wefts of textiles, ranging from altitudes of soft velvets and starched piquets to longitudes of precious brocades and unexpected geometries of mystical tapestries.

Fashion is an extraordinary alchemical crucible that can suddenly decree the future of a fabric.

Coco Chanel was the first to define elegance not just with expensive materials, but rather by the discovery of new uses for classic fabrics. Darks, black and white, touches of tweed, as well as her legendary bouclé suits were highlighted and shared thanks to her inspired brilliance. She has also the merit of elevating the humble jersey, up to that point considered a poor, unrefined fabric unsuitable for couture pour Dames, to the supreme status of insignia of femininity. And from that moment on, a new luxurious use for the humble fabric used by the English fishermen from the Island of Jersey took place...

Courage, curiosity and creativity not only belong to the whole world, but especially to fashion, which comprise a true arsenal of transformations, a red hot forge for change and social evolution.

Technology often imitates and draws from nature...

The importance of science in shaping everyday life and fashion is reflected in innovative and creative ways. Today, instead of asking what fashion can do for science, it would be more appropriate to ask what the science of textile technology can do for fashion. Intelligent shirts that can dialogue via WiFi with a data base in order to monitor vital parameters of the patients, athlete, military corps, or elderly and fragile individuals. Textiles that can help our quality of life by releasing botanical or pharmaceutical substances, as in the case of the shirt for diabetics which releases insulin.

The link between the scientific world and the fashion industry has become even stronger and more purposeful, as addressed by a specific academic course instituted by me during the past years, at Rome’s Sapienza University.

Fashion meets science in a kind of ideal epicenter, where technological and historical research produces invaluable results when used to determine the role of fabric in a completely innovative and scientific context.

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1 Valeria Mangani, Professor at La Sapienza University in Technological Fabrics and the Quality of Life, has served as External Relations Manager for the Mayor of Rome since 2008. Educated at the Parsons School of Design (New York), graduated at the Istituto Europeo del Design (European Design Institute, Rome) in Fashion Design. In 2009, she was appointed Vice-President of AltaRoma SpA. In collaboration with the Rome Municipality she founded the Istituto Internazionale del Made in Italy (The Made in Italy Institute) that will teach undergraduate courses in Food, Fashion and Design with the La Sapienza University of Rome. Since 2006, Mangani has served as President of the Associazione Universo Femminile (Female Universe Association): a non-profit organisation founded by Mangani with about 2000 members. Mangani has been awarded many prizes in Italy for her indefatigable work for the promotion, protection and estimation of the Made in Italy in the world.

Valeria Mangani, born in Johannesburg, South Africa, lives in Rome.

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A tale of two cities: Prato and Almere
An innovative example of textile recycling: the old female uniforms of KLM

Olaf Hoftijzer, Commercial Director Italy for Air France – KLM²

In 2010 KLM outfitted 11,000 of its female staff with new uniforms and this has put some 90,000 kilos of uniforms out of use. The Dutch Airline decided to recycle the old textiles and sought out a number of partners to help prove that it is possible to transform old textiles into raw materials for new, high-quality products without harming the environment. “According to KLM’s sustainability policy, which gives priority to environmental, social and economic aspects, it was natural for us that the old uniforms should have been processed in a responsible manner. It was KLM’s aim to go beyond recycling to up cycling of the old textile. In the past, old uniforms were incinerated for safety reasons, not a particularly sustainable process” says Olaf Hoftijzer, Commercial Director Air France KLM in Italy.

In the first part of this project a number of prototypes have been produced, such as suitcase belts, laptop bags and slippers. KLM has produced, in cooperation with Texperium, a blue scarf totally made of recycled textiles and, benefitting of the expertise of the designer Omar Mounie, has produced a limited edition of handbags and luggage tags. The designer handbag by Omar Munie tells a story of its own. Up cycling from former KLM ladies’ uniforms, it is the perfect union of sustainability and style. The eye-catching bag also makes a powerful statement on creativity and courage – as does the life story of its designer, who fled his native Somalia at age 9 and now owns a trendy shop in downtown Rotterdam with a circle of clients that includes numerous celebrities – like Hilary Clinton and Jane Fonda.

The new frontier of the up cycling of the old KLM uniforms will see the production of the carpeting of the new business class, which will be introducing in September 2013. KLM recycles all of its discarded carpets in collaboration with carpet manufacturer Desso based on the cradle-to-cradle principle. This is in line with the CSR policy KLM has pursued for years.

Between 21 January and 15 March 2013, also Air France organized a collection of old uniforms worn by ground staff and crew at Paris-Orly and Paris-Charles de Gaulle. The clothes will be transformed into car insulation at a specialized recycling plant. 35,000 uniformed Air France employees have been concerned. The estimated weight of the clothing collected is close to 30 tons, representing 1,350 insulated cars. This action is being conducted in partnership with SITA SUEZ Environment.

“Together with Air France, KLM wants to set the standard in corporate sustainability within the airline industry. We want to be a main driver in this aspect. KLM carried out its first flight using biofuel in 2009, and today one weekly flight from New York to Amsterdam is partly powered by biofuel made from used cooking oil, a clear illustration of our aim. KLM has shown again that it can do this. We’re the first airline to have our old uniforms reprocessed into new, high-quality products. It’s a perfect example of corporate social responsibility and a source of pride for KLM staff. It’s good for people, the environment and our wallet. We worked on the project together with textile companies, educational institutions and governmental authorities” concludes Olaf Hoftijzer.

Once the full 90,000 kilos of old uniforms will be reprocessed, it will save at least 500 million litres of water and reduce carbon dioxide emissions by 4,600 tons compared to the production of new textile.

² Olaf Hoftijzer holds a Master of International Law from the University of Groningen. He started his professional career with KLM in 2006 as GDS account manager. Between 2008 and 2011 he served as Commercial Director Near East for Air France – KLM. In February 2011 he became the Commercial Director Italy, Albany & Malta for Air France – KLM. Olaf Hoftijzer lives with his family outside the city of Rome.
A tale of two cities: Prato and Almere

Creating new jobs for the worldfamous textile district of Prato

Roberto Cenni, Mayor of the city of Prato

Introduction

There is a word that that symbolises – yesterday, today and surely tomorrow too – more than any other the town of Prato. That word is: TEXTILES.

The history of Prato and a part of our identity are bound to the cloths, rags and shreds that, as Malaparte said, come from all over the world and end up in Prato. These discarded materials are brought back to life in Prato thanks to the hard work and enterprise of a district now seeking to be a business model, balancing tradition and innovation in order to meet new environmental demands.

State of the art and objectives

Here are some figures about the new textile product made in Prato – cardato:

Every year in the Prato district 30,000 tons of regenerated textile materials (about 50,000,000 metres of produced fabrics) are used, leading to savings of 96 million kwh of power, 1,000 tons of chemicals, 450 tons of dyestuffs, 27 million of CO₂, 1.5 million of SO₂ and 720,000 m³ of water (Source: Prato Union of Industrialists)

The recycled product, which may become a market ‘brand’ as it increasingly finds the favour of eco-aware consumers, is actually a ‘made in Prato’ product.

The aims of AC:
- to objectively guarantee the quality and safety of the recycled product all along the supply chain, spreading a veritable ‘recycling culture’.
- to invest in communication in order to inform final consumers about the quality of the recycled product and the enormous savings that can be made in terms of environmental impact. support Green Public Procurement initiatives (so-called PA ‘Green tenders’), which would be a great opportunity to create new jobs and new markets for the textile district based on a ‘glocal’ logic, in other words GLOBAL combined with LOCAL.

These objectives are being pursued in part through an agreement reached with the Municipality of Almere in the Netherlands, regarding collaboration between the two Organisations in the sphere of RECYCLING.

Concrete Actions

We are already working on the creation of a ‘total look’ collection of recycled products with the right modern design and the quality that the market has come to expect and demand.

The collection will be presented in forthcoming trade fairs, but also to the European Parliament in order to request a review of tender regulations for the supply of uniforms and clothing items, which as things currently stand do not contemplate the possible use of recycled products.

Conclusions

I will finish by citing the title of an excellent exhibition now being staged at our Textile Museum, which narrates 800 years of textile history in Prato. The initiative is dedicated to the subject of VINTAGE production, and thus includes the subject of recycling:

Vintage fashion: the irresistible charm of the past.
A tale of two cities: Prato and Almere

The Netherlands as textile roundabout: an opportunity for sustainability and for jobs in Almere

Henk Weyschedé, Director EDBA - Economic Development Board Almere

Everybody knows the facts: the supplies of raw materials are decreasing and prices are going through the roof. These raw materials have a very negative environmental impact. Europe and The Netherlands do not have a lot of raw materials, we do have many products such as cars, mobile phones, household appliances, textile etc. Because of the increasing prices of raw materials, recycling of these products becomes profitable. For example 1,000 kg of mobile phones contains more gold than 1,000 kg of gold ore. We grow from a linear economy to a circular economy, where we reuse and recycle more and more materials. We speak of urban mining where raw materials are input and output in the raw materials roundabout.

Cotton is identified as the least preferred choice when it comes to environmental impact, due to its high eco toxicity impacts, water use, land use, and relatively low land use efficiencies. Companies and government are searching for other materials than cotton and recycling procedures.

The city of Almere

From the moment of its establishment in 1976, Almere has been one of the fastest growing cities in Europe. Since its initial development as a suburban area east of Amsterdam, it has grown into the status of Holland ’s most exemplary new town. In just 37 years it has attracted over 194,000 residents and 15,000 businesses. Almere is the largest city in the province of Flevoland and the seventh largest city in the Netherlands.

Its ambition is to double in size over the next twenty years, making Almere the fifth largest city in the Netherlands. This will entail building 60,000 new houses and creating 100,000 new jobs. The intended growth of the city will take place in an ecologically, socially and economically sustainable way.

The Economic Development board

The Economic Development Board Almere (EDBA) is the city's primary agency that plans and executes strategies to make Almere (and with it the Amsterdam Metropolitan Area) a compelling (inter)national

3 Henk Weyschedé has over thirty years of experience in general government, change management and the setting up of new organisations. He is especially qualified in working at the interface between government and industry, realizing new public – private partnerships. He served as director for companies in the food industry and insurance sector. Since 2007 he is active as Director at WMD Interim management & consultancy. In 2010 he was appointed Director at the Economic Development Board of the City of Almere (EDBA). Henk Weyschedé, economist, was educated at the University of Amsterdam.
hub for businesses and investment across key economic clusters. The EDBA promotes links between organisations as government, businesses, research and education (the triple helix) in order to develop the human, intellectual, financial and cultural capital needed to create a vibrant, self-sustaining environment for enterprises of all sizes.

The Economic Development Board Almere, together with Dutch and Italian companies from the (textile) industry and REMO are starting a textile roundabout, aiming for a circular economy. This means, closing the recycle production chain, boosting sustainable economic growth by creating sustainable jobs and a better world. Making new textiles out of old textiles and reducing the environmental impact tremendously. 2/3 rd of all the discarded clothes ends up in the waste bins and the incinerators. This is a great loss of good materials. People should be more aware of the value of goods and the government must create the right conditions.
The Board of Almere signed a letter of intent with the municipality of Prato, Italy for the sharing, improvement and development of innovative projects aimed at reusing materials and disseminating good environmental practices.

The Municipality of Prato is the core of the largest Textile-Clothing industrial district in Italy. The economy of the Prato District has been created and developed around the culture of the reuse of textile products, with the development of technologies and skills to take “rags” to the status of prestigious fabrics.

It is the interest of the Municipality of Prato to favour ecologically responsible behaviours and economic initiatives that combine the respect for the environment with profitability and the creation of job opportunities and widespread wealth.

The Municipality of Prato and the Municipality of Almere are inspired, in the development of their communities, by the ‘from-cradle-to-cradle’ principle conceived by the American architect William McDonough, according to which the life of human actions should not be simply designed ‘from the cradle to the grave’, i.e. by planning and reducing all the impacts of an action or individual from birth to death, but by taking the responsibility to ‘reduce, reuse, recycle’ as much as possible, so that each thing may start a new life in a virtually endless cycle.
Green economy and strategies for sustainable fashion

Green economy: the way out of the double crisis

Raimondo Orsini, Director of the Sustainable Development Foundation, Rome

Recently, the Sustainable Development Foundation published the report *Green economy per uscire dalle due crisi* (Green economy to get out of two crises), the first report on the green economy in Italy. The Report is the result of the collaboration between a group of ENEA researchers and the Sustainable Development Foundation.

The green economy, in the words of Edo Ronchi, President of the Sustainable Development Foundation, focuses on the production of goods and services of a high ecological quality, able to address both the financial-economic crisis and the environmental crisis, fueling a new development. Ronchi emphasizes that the green economy promotes the idea of not being tied to the growth of consumerism, but to the development of a more righteous, sober and conscious consumption, calling for an efficient use of energy and resources, product and process innovations, new skills and competences, with significant potential for an increased employment.

It is good to know that companies that are involved in sustainability achieve much better results than those who aren’t. In our report we point out that Italy has a lot of potential grow in the green economy. The recycling sector is one of the eight sectors we have analyzed; the sector is considered of strategic importance for the development of Italy’s green economy.

Change of mentality

Instead of two crises, the World Energy Council discerns even three crises, adding a social crisis to the above mentioned crises. The social crisis challenges us to change our habits and urges companies to change their way of conducting their business.

If we really want to change, it is good to bear in mind what Albert Einstein said: ‘Problems can’t be solved by using the same kind of thinking we used when we created them.’ In other words: we will have to invest in projects based on a different mentality. To help create and define this mentality, the Sustainable Development Foundation organized last November in Rimini the *Stati Generali della Green Economy* (‘General States of the Green Economy), together with the Minister of Environment Corrado Clini and the Minister of Economic Development Corrado Passera. Over 1500 experts discussed new solutions in eight pillars of the green economy, such as recycling, renewable energy, energy efficiency and biofuel, the targets of green economy. 70 proposals have been presented. It is important that these experts, also coming from big companies, shared their ideas with the government. And recycling is one of the big issues.

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4 Raimondo Orsini graduated in environmental law in 1993. He was consultant for environmental law firms and consumer rights associations, and worked for TREntalia as Environment senior advisor. From 2005 to 2008 he lived in Paris as Coordinator energy and environment for the International Union of Railways (UIC), being responsible for the World Competence Centre on environment and sustainability. In 2008 he became director of the Sustainable Development Foundation. During the last 12 years he has been member of EU Commission working groups, international research projects, CEN and EEA expert groups on environmental topics.

The Sustainable Development Foundation is a think-thank, an NGO born on September 13th 2008 by will of companies, firms association and sustainability experts, in order to encourage the development into the field of green economy. Today it can rely on a members’ network of more than 80 firms (or associations of firms) and 50 top level experts. Main areas: climate change policies, renewable energy, sustainable mobility, waste prevention/recycling, sustainability reporting and indicators. The Foundation is member of UN Global Compact, Global Reporting Initiative, European Foundation Centre, and the International Solid Waste Association. It plays an active role in the European Environment Agency, International Energy Agency and the World Economic Forum.

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Green economy in fashion: trendy?
Fashion, the subject of today’s conference, is closely connected with the word ‘trendy’. Is green economy in fashion trendy? Will it disappear again within five of six years, or is it here to stay? What does trendy really mean? According to the dictionary: ‘Trendy can be seen as very positive, being fashionable and modern. But being trendy can also be seen as something negative, looking at fashionable as the opposite of being seriously thinking about ideas.’ For green economy and fashion the question is whether we are on the positive or on the negative side. In history there are examples of being trendy in a positive way. Colonel Albert Hope established in 1901 a company that produced 500 electrical cars, being cleaner and producing less noise. Although his idea was perfect, he failed, because he had the right idea at the wrong moment.

There are also examples of less trendy innovations, like a car made from the perspective of safety, but being very impractical at the same time. Or a moped of one wheel, a well-developed invention that was not successful.

In fashion you will find many fashionable trends that may be nice, but not so sustainable. So how can we make sure that trendy means that you change really for the better? To start with, we need a solid definition of green economy, like that from the United Nation Environmental Report of 2011 ‘Towards a green economy’. The Report states that: ‘A green economy can be thought of as one which is low carbon, resource efficient and socially inclusive’. The last words of the definition are important: the economy should not only be green, but socially inclusive as well. This is why the collaboration between Almere and Prato in the recycling of textiles is a good example of green economy: it is low carbon, because CO2 emission will be reduced, it is resource efficient because we recycle material and it is social inclusive with impact on two social districts in Europe.
Recycling of textiles
In 2008 many countries were investing in a green stimulus package. E.g. in the USA banks and companies invested substantially in the green economy. In 2007 the Bank of America invested about $8.4 billion in energy efficiency. And Goldman Sachs announced a $40 billion program, covering areas as varied as solar and wind power generation, energy storage and green transportation. From the mid-nineties the investments have been tripled. This input from governments and banks will lead to a serious change. The increasing scarcity of natural resources necessitates this change. The effects of scarcity can be seen from the development of the prices of fuel and minerals, but hold true for every natural resource. This means that recycling is needed as well as the investment in renewable energy and minerals.

Remade in Italy
The Sustainable Development Foundation every year publishes a report on recycling in Italy. In the field of textile the separate collection of discarded textiles has been growing continuously and in 2010 it reached the figure of 80,300 tons. And with the agreement signed in March 2012 by CONAU (National consortium of used clothes and accessories) and ANCI (Association of Italian municipalities) to collect textiles in municipal waste, the hope is that volumes will rise threefold by 2020 to reach about 240,000 tons of rejected textile materials for recycling.

So we are ready to move from ‘Made in Italy’ to ‘Remade in Italy’ as far as the fashion industry is concerned.
Green economy and strategies for sustainable fashion
A vision on recycling and the distribution of textile fibres

Peter Bos, Director Frankenhuis Group International and President Texperium, Haaksbergen

Frankenhuis has build-up a reputable name as an industrial textile reprocessing company over the past 130 years. Since a few years also strongly represented in the confidential destruction of textile with a risk profile such as corporate clothing and uniforms.

VAR|Frankenhuis originates out of a joint venture between Frankenhuis & Sons, as an industrial textile waste re-processor, producing for low-end textile applications such as mops, felt and paper industry and VAR- Veluwse Waste Recycling, as an industrial and household waste recycling company in The Netherlands, part of the Attero Group. This Joint Venture represents an important added value for both companies as both are focused on the recovery of raw materials out of waste into new products. VAR|Frankenhuis stands for innovation in the textile recycling. New insights on sustainability in combination with new technology can create a second, high-end lifecycle for old and discarded textile. Because of the strong position of VAR|Frankenhuis in the field of textile recycling and innovative processes in The Netherlands, the Minister of Environment affairs Mrs. Huizinga, Deputy Mrs. Drs. Abbenhuez and CSR Director of Air France-KLM Mr. de Groot where pleased to open our newly built textile recycling company on September 9, 2010.

VAR|Frankenhuis is situated in a new premises at Haaksbergen. It meets the highest level of safety and environmental requirements and is very efficiently set-up for all its purposes. The company features the organisational and production quality management system of ISO 9001 and the environmental quality management system of ISO 14001.

A renewed approach, in cooperation with the various governmental and industrial partners, made it possible for VAR|Frankenhuis to develop a new and unique innovative production process for high-end recycling of old discarded textiles.

Until now discarded textile are mainly used as secondary fuel in the waste incinerating process.

During a pilot case in 2010, VAR|Frankenhuis and Air France-KLM demonstrated in guidance of Texperium, a range of high-quality products, created out of the old KLM cabin crewmembers uniforms. During this pilot the discarded uniforms from KLM- crew members were destructed and fiberized under highly secured conditions. The newly produced regenerated fibres have been reprocessed into new products, as shawls, bags and suitcase belts. The objective of this project was to produce prototype products on market-based prices and to demonstrate the ecological profit (4700 tons CO2) by using the MODINT LCA-Tool. This pilot-case was a great success and published by leading branch journals. This

5 From 1990-2012 Peter Bos, educated at the Vrije Universiteit (Free University) of Amsterdam, has been director at S. Frankenhuis & Zoon bv. In 2012 he became general director at VAR|Frankenhuis (Haaksbergen, the Netherlands). In 2010 he was co-founder, together with Gerard Reimert and Anton Luiken, of Texperium, the Dutch open innovation center for high-value recycling of textiles. Texperium improves the textile research infrastructure in the Netherlands with respect to ecology, technology and economy and focuses on product development involving regained fibre materials. The founders are firmly rooted in the European research infrastructure for the textile industry; they initiated (European) projects like Identitex, Jeans 4 Jeans and Textiles 4 Textiles. Bos serves as President for the foundation. In 2011, Bos was invited speaker at the 2011 ISWA Beacon Conference (Vienna) on ‘Waste Prevention & Recycling’.

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pilot made other companies aware of the eco-footprint of their textiles and gave them thoughts about textiles in the context of sustainability and CSR.

VAR|Frankenhuis has invested in this unique concept, where old and discarded clothing are used as raw materials for reprocessing into various industries. During this process the garments are unraveled and stripped from buttons, zippers and other non-textile parts. After having thus reprocessed old textiles, pure quality fibres remain. These regenerated fibres can be blended together with virgin fibres (e.g. 50/50) into first quality yarn at market price level. This whole process is controllable, transparent and traceable.

This distinguishes VAR|Frankenhuis from the many other traditional textile repressors.

The new developed production line of VAR|Frankenhuis is highly innovative and energy efficient. We have chosen for the next generation operating system which gives up to 60% energy savings compared to the conventional fibre regenerating production lines. This together with the proven positive eco footprint of regenerated fibres makes VAR|Frankenhuis a CO2 recuperating company. This technology is also implemented in the new and innovative artificial grass recycling system at VAR.

Innovation does not stop at developing a new production line only. VAR|Frankenhuis is also one of the initiators, founder and participant at Texperium Foundation.

Texperium is an open innovation center for high-quality recycling of textile materials. As VAR|Frankenhuis is specialized in regaining textile fibres out of old and discarded textiles, Texperium Foundation makes the next step into product and production development. The ultimate aim of Texperium is developing high-end textile related products out of regained textile fibres by chain approach of complementary companies. This can be achieved by intensive cooperation between industrial partners, Government, research, and educational institutions.

A recent example of a Frankenhuis/Texperium development is the re-processing of corporate clothing or textiles with a commercial or safety risk. Companies and organisations regularly change their
professional clothing, such as uniforms and work clothing. This clothing, equipped with logos and identifiers, may not be put in circulation again. Safety aspects require a secured and reliable destruction. In addition, we see more and more unsold or damaged brand clothing, removed out from circulation for commercial considerations. These large quantities of unused textiles are until now usually burned as waste in the incinerators. High-quality recycling of valuable raw materials is now lost. VAR|Frankenhuis provides a sustainable alternative.

Certified confidential destruction and reprocessing of these textile materials ensures that, contrary to the 'regular' incinerated destruction of these clothes, the valuable regenerated fibres are preserved for high-end re-use. These applications are not only for professional clothing with a risk profile or brand clothing, but also for textile materials that for whatever reason are not allowed to be re-used in the current market.

Texperium has, in collaboration with TüV Rheinland, developed for VAR|Frankenhuis a confidential and guarded system of Certified confidential destruction and reprocessing of these textile materials. The total material flow is put insightfully on mass balances and protocols.

In the protected and secured destruction location of VAR|Frankenhuis in Haaksbergen we also calculate the environmental gains of this recuperation process using a life cycle analysis tool, provided by the Dutch textile trade organisation Modint. This LCA tool looks at the environmental profit expressed as CO2 emissions, chemicals, energy consumption, reduced land use for agriculture and water usage. Peter Koppert from Modint will demonstrate this LCA Tool in the afternoon.

By using this tool, we have demonstrated the advantage of destruction and reprocessing the fibres of the old KLM cabin crew uniforms over incinerating them. The shawls shown, are a result of collaboration between VAR|Frankenhuis (regenerating the fibres), GM Filati (Spinner) and le Noir and Cecchi y Cecchi (design knitting/weaving). Texperium has teamed up with Martin Havik in realising this initiative of making these shawls. In this pilot project we achieved the production of high-quality new products against market-based prices as well as an ecological profit of 4700 tons of CO2.

Also for Mr. Havik and REMO, Texperium has developed the REMO key, a track and trace system that gives the consumer a simple, traceable and transparent system that tells the real story of their clothes (at least the part that has to do with recycling). It will tell you the exact environmental savings realised
by producing a garment containing recycled fibre compared to a similar garment made of virgin fibres. The information includes reductions in CO2 emissions, energy use and use of water. The calculation of these environmental savings was enabled by using the life cycle analysis tool, provided by Modint.

On top of this, the key provides access to the production trail of your garment by giving you the detail of used recycled material and used virgin material at every step along the production chain.

In principle the system does not require any further administrative effort from the user(producer), because all transactions will be carried out on-line and all required checks to ensure the reliability and integrity of the data are build-in. This implies that the user will not have to keep any paper trail and consequently there need to be no additional system audits done of the user related to use of the REMO key system. Henk den Herder as member of the Texperium team will tell you this afternoon more about this track and trace system.

<table>
<thead>
<tr>
<th></th>
<th>Virgin (kg)</th>
<th>Regenerated (kg)</th>
<th>Difference (kg)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2-equivalents</td>
<td>5.000</td>
<td>260</td>
<td>4.740</td>
<td>95%</td>
</tr>
<tr>
<td>Energie (TJ)</td>
<td>38.2</td>
<td>4.4</td>
<td>33.8</td>
<td>88%</td>
</tr>
<tr>
<td>Water (m3)</td>
<td>83.000</td>
<td>945</td>
<td>82.055</td>
<td>99%</td>
</tr>
<tr>
<td>Chemicals (kg)</td>
<td>29.000</td>
<td>8.800</td>
<td>20.200</td>
<td>70%</td>
</tr>
<tr>
<td>Land use (ha)</td>
<td>10.500</td>
<td>0.2</td>
<td>10.500</td>
<td>100%</td>
</tr>
</tbody>
</table>

As Texperium we consider the ‘ladder of Lansink’ a cascade model, as a realistic achievable objective. According this model the highest achievable in textiles, is spinning a yarn out of regained textile blended with virgin fibres, for the time being in a 50/50% mixture.

Recently, the Rework-Workwear project was launched by Mr. Micheal Braungart, demonstrating the ecological and economic profit of reusing 50 % regenerated fibres out of discarded textiles into new work wear . In this project the corporate clothing producer HaVeP, the waste processor Van Gansewinkel and the industrial laundry services Berendsen and Lavans demonstrated in corporation.
with Texperium, VAR Frankhuis and GM Filati, the possibility of producing C2C corporate clothing at market-based prices with a high ecological profit, was demonstrated.

Sensible reuse of raw materials is not only showing us a demonstrable ecological profit but will also contribute to the annual rising demand for raw materials. In the textile industry we are facing an annually increase demand of textile fibres of 4% worldwide. This increasing demand will make the use of regenerated fibres in textiles necessary, new technology will speed up the processing and all this will result in acceleration of the economic added value.

2/3 of all used textiles now disappears in incinerators. Besides the increasing cost for the municipals, a major part of these textiles could have been reused by using a better collection and sorting system. Texperium challenges you in developing a solution, which not only realises proven environmental gains but also safes high cost of incinerating by the municipals and prevents a high loss of valuable raw materials. We need to do this in a broad cooperation between local waste management, industrial partners and authorities.

Now let’s look at Europe:

Europe has about 500 mn. residents, who use and discard approximately 12 to 15 kg textile annually each. This creates approximately 7,5 mn. tons of old discarded textile of which only 1/6 or 1,2 mn. tons is collected by charity or commercial collectors as rewearable 2nd hand clothing. The vast majority of this 6 mn. tons is incinerated as garbage or dumped as landfills.

If we use the estimate of 5 kg carbon footprint per Kg textiles, we are talking about a 30 mn. tons CO2 loss annually.
Carbon credits are approximately € 4.- per ton according to the Verified Carbon Standard, this means an extra financial loss for the textile industry on top of the loss of reworkable fibres of € 120.000.000.-

The Texperium objective is to reduce by 1% every year the amount of textiles that are incinerated or dumped and instead make them suitable for reuse as regenerated fibre. The KLM and Rework Workwear projects mentioned above have proven the possibility of blending 50% re-generated textiles fibres into new high quality products. Now we have to consider the financial comparison of the re-generated fibres to virgin fibres. Just as a comparison. I would like to give you the prices of average virgin cotton at € 2,- to regenerated spinnable cotton at € 0,80 kg.

Innovation is a continuous process in which we seek new developments and products with a commercial market implementation. Your commitment and help is needed to achieve this first step forward. In addition, we have to communicate better with residents, the local and regional authorities to create the wide support, needed to achieve this 1 % increase year by year.

One of the objectives of the LAP2 (National Waste Plan 2) in Netherlands is to collect 12.5 kg per capita of discarded textiles, sort it out in re-usable qualities and regenerate it. This in contrast to the current < 5 kg. per capita. We call it the raw materials roundabout.

<table>
<thead>
<tr>
<th>Per 1000 ton</th>
<th>Fte</th>
<th>Added value</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection &amp; Sorting</td>
<td>7.5</td>
<td>€ 1 300 000</td>
<td>€ 325 000</td>
</tr>
<tr>
<td>Recycling</td>
<td>1</td>
<td>€ 220 000</td>
<td>€ 160 000</td>
</tr>
<tr>
<td>Industrial products</td>
<td>2.5</td>
<td>€ 780 000</td>
<td>€ 660 000</td>
</tr>
<tr>
<td>Consumer products</td>
<td>10</td>
<td>€ 1 875 000</td>
<td>€ 1 400 000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>€ 4 175 000</td>
<td>€ 2 545 000</td>
</tr>
</tbody>
</table>

By using regenerated textile fibres in our industry we will be able to face the annual increasing demand for textile fibres at market based prices. We can bring back the textile industry to Europe, by creating an ecological and economical balanced environment due to innovative and competitive systems. We will able to create about 21 new jobs per 1000 tons along the total system. All this makes the textile industry profitable, sustainable and will distinguish us from the regular and traditional textile industry. It is just a matter of doing it, together.
Green economy and strategies for sustainable fashion

Big brands and the future of sustainable fashion

Alessandro Viganò, ‘Wanderer at Uncommon Places’ / Former brand manager a.o. Armani Jeans, Dolce & Gabbana, Alpinestars, Blue Bell USA and Wrangler

The shirt I am wearing today is 100% recycled and over-dyed and looks very trendy. And my trousers are treated in an ecological way: during the washing process air and laser was used, instead of stone washing and water, which means saving water and avoiding the use of chemical products. In other words: denim is moving from a polluting industry to an eco-friendly industry. I am happy to show you some examples of this development.

In brand management, the creative director, marketing managers and brand managers work together to maintain, to improve and to uphold a brand. Brand management is part of marketing. In order to add ‘green value’ to a brand, it will be necessary for brand management to form a staff dealing with the subject of recycled fibres.

The denim industry is the greener movement of the fashion industry. Already many years ago, Levi’s for instance started to decrease the use of water and chemicals in the production of their denim clothes. We now reach a level of performance where it is necessary to start reusing the fabrics. The next step is to develop more fabrics with recycled fibres and yarn.

At the Munich Fabric Trade Fair (February 2013), there will be a large area, showing the latest developments in the field of sustainable development, using the slogan ‘Turning green visions into great products’. And new green developments will be shown at the Paris Fabric Trade Fair (Spring 2013) as well.

Levi’s

http://www.youtube.com/watch?v=L9iOUea46TU

The first video shows the concern with water usage. Levi’s looked into the complete production circle and discarded the use of water where possible in the process, without having lesser end results. Instead of water for instance ozon has been used. This means saving millions of litres of water and bringing new craftsmanship into the production process. For Levi’s this is just the beginning. In Italy Levi’s added to this the ‘Cala le braghe’-action (‘Drop your pants’) in 2012, paying € 25,- for each denim brought back to Levi’s by the customer, buying a new one. That is a large amount of money, compared to the average price of € 80,- for a jeans.

This is the start of reusing textiles in a better way, also promoted by REMO (Recycle Movement).

Marithé + François Girbaud

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6 Alessandro Viganò is former brand manager of Armani Jeans Men’s collections (Italy). As brand manager, he has been responsible for setting up the Global Men’s collection and brand direction and management of the product range. He also acted as creative director for Wrangler EMEA (Belgium), creating and setting up the EMEA & Far East collections. For Dolce & Gabbana he was responsible for product research and developments ‘abroad’ – setting up a network of suppliers in e.g. China, Indonesia, India, Turkey and many other countries worldwide. He was educated at the Textile Institutes of Como and Castellanza Varese and the School of Art Castello Sforzesco (Milan).

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In the washing process of the denim inventions were made by the label Marithé + François Girbaud, using air and laser during the washing process, instead of stone washing and water. Moreover the label creates effects on the fabric that normally only occur after wearing. Eventually, this will change the treatment of the cotton. For the production of cotton a lot of land and water is used, that according to Marithé + François Girbaud should be used for food production. The label states that it would like to share their technologies with other brands and to spread their knowledge.

**Nudie Jeans**

http://www.youtube.com/watch?v=fW-rm3Lu3CM

Nudie Jeans is even going further, recycling the cotton, like REMO advocates. And it shows the importance of catching the mind of the creative people to reach the goal. Nudie Jeans also collects your old denim to repair it. This action is communicated by “RE PAIR, RE USE! REDUCE”. This is an innovation in terms of brand management.

**Rimaks**

http://www.youtube.com/watch?v=exfBDPewsO4

The last example of improving the production circle is that of Rimaks, Turkish fabric supplier. In order to contribute to saving the earth and to develop an environmental friendly denim, Rimaks came up with a better, smarter and more sustainable production process for denim. The label started to use organic recycled cotton and reinvented its washing methods. The result is the usage of less energy, water and chemicals. They also produce less waste. The product is called Eco-smart DENIM.

It is frustrating that there are no Italian companies that can be shown as an example for the development of green production processes. Even in China, the last country we would like to talk about when we think of ‘Made in China’, you find excellent examples: a denim factory that for about 20% is running on wind energy, striving to run on just natural energy within a few years.

My message is that it is very important to develop all sorts of denim from recycled and organic material, as I did for instance with Armani Jeans. And I am glad that I can promote this message thanks to Martin Havik of REMO and Casa della Sinergia.

The developments I have shown are very important for brand management and the creative site of it. Big companies like C&A, Peek & Cloppenburg, Lafayette and Selfridges are looking for something new and green. We have to keep in mind that innovation doesn’t always mean developing new technologies or using the latest new products, but can also mean to use recycled material. In the end I believe that REMO can cover the gap between brands and textile companies. Today we need companies that believe in making these recycled fabrics.
Green economy and strategies for sustainable fashion
*Trends in fashion and sustainable design*

Angelique Westerhof, Director Dutch Fashion Foundation, Amsterdam

We all have our images that spring to our minds when we are thinking of recycling. Most often we imagine piles of clothes that are brought to third world countries, either for direct use or for the shoddy industry like in Panipat, India. Panipat is a good example since here lies the centre of the shoddy industry that recycles worn clothing by reclaiming their fibres and spinning them into regenerated yarn. Usually the yarns are that poor in quality that they last only another season – or when lucky - two, and therefore are usually sold to the poor or used as emergency relief blankets worldwide.

In the last couple of years there has been a global awareness that forced people to think about new ways to produce and create. Eco-consciousness has become an important part of the fashion industry worldwide. Although many designers implement ‘green’ into their collections, recycling is still underexposed. For example, in the USA 2.5 billion pounds of post-consumer textiles are wasted every year, an average of 68 pounds per American. Initiatives on the web like Ecouterre are boosting mostly this counteraction on the current excessive production of garments introducing alternatives to the fast fashion chain. The fast chain being mainly driven by getting products out there with power, for low prices in order to gain quick profit and quick growth by production in low wage countries seems to be an unstoppable and hungry monster. And maybe Fashion is the hungriest of all monsters. Nevertheless we see – mostly at the web – slow fashion reactions, companies that root for awareness by wider audiences, making conscious propositions, quality-over-quantity driven fashion brands, up scaled products, re-commerce spaces which in itself do recycling from consumer to consumer or from business to consumer. Highly valuable counter reactions, that steer mostly over the angle of sustainability, and gearing at a cooperation with the consumer for a continuity of everyone’s future, aiming at an open and transparent communication about the whereabouts of the garments they are buying. But above all we

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7 Angelique Westerhof is regarded as a pioneer and one of the key members in the development of the Dutch fashion climate since the 1990s. In 1998 Westerhof was asked by the Arnhem Academy of Art and Design (ArtEZ) to set up the one year fashion master course Fashion Institute Arnhem (FIA) together with fashion illustrator Pieter ’t Hoen, also known as Piet Paris. Westerhof and ’t Hoen both had a large network in the international fashion industry and strived to set up contacts between young, talented designers and the international fashion scene. In 2000 Westerhof observed that fashion designers who had graduated from the Fashion Institute Arnhem had difficulties presenting their collection to a wider audience, set up their own fashion labels and find a connection with the fashion industry on their own. In 2001 she established the Dutch Fashion Foundation to develop the status of Dutch fashion as a collective discipline in the Netherlands and abroad.
see that they are two different worlds that hardly meet nor have the semantic capacities to reach out for each other.

Meanwhile in the Netherlands the Dutch have also been inventive with the term recycling in fashion and there have been many upcoming designers who implemented ‘green’ into their collections. For example, Mattijs van Bergen, winner of the Mercedes-Benz Dutch Fashion Award 2012 created his collection by reusing fabrics of earlier collections. Smaller initiatives also include recycling into their concepts, like ‘Refinity’ removable prints or applications on recycled or recommended fabrics. Or ‘Halona’, a line of cool and fashionable t-shirts made of waste textiles from established Dutch labels like Humanoid. Or the Arnhem based brand ‘Van Markoviec’ that is a true fashion pioneer in the slow fashion movement respecting the 7 R- principles yet remaining a cool brand. Designer Jan Taminiau created a dress made out of old post bags for our Royal Highness Princess Maxima, in which she appeared twice, making the statement that recycling can also be of royal standard.

In the spectrum of eco, green, fair wear, fair trade, and fair luxury recycling seems to be the biggest hurdle to take. And within the entire pre-work that is done by many recycling lobbies and laboratories we see that fashion itself has been absent. Although ideas are in the nature of fashion designers, and experiment is the base of high fashion, an implementation of the creative developers at an early stage within the chain of innovation so far seems to be lacking. Further up in the chain, fashion as a language, as the storyteller – it is equally absent. The implementation of new ideas around recycling are simply not filtered through the mediums of fashion.

We all know why. There is something else that next to all the implementation in the chain, simultaneously needs to be done in order to achieve that a final recycled fashion product can appear in fashion magazines, worn by the right models, introduced to the wider fashion audiences. We need something in our hands – a product – that says ‘recycling’ which is open and transparent to the consumer, but it will have to be made with yarns and become products that breathe a mood, that appeal to an emotion. Fashion is more than anything else a medium for storytelling and in order to achieve those qualities within the recycled yarns we have to cut and paste in the current chain of development and overcome a semantic discussion between technicians and creatives. We should bring them together in laboratories where they can join forces in a small and intimate setting. Invest in those laboratories, bring in the translators, those people who can bridge the semantic discussion. Recycling means the connection between ideas and material at an early stage of the development of the fibres,
rescheduling the traditional linear process chain. The power to surely and finally boost these newly
developed ideas lie in the strength of pioneering collaborations between the fast and slow fashion
chain.

In the beginning it will be over the angle of marketing and communication. Currently only in
communication lies a free space that can be directive or interactive with the consumers. Teaming up
with the right powerful partners within the chain of fashion in order to bring these new ideas to the
consumers – who are actually more ready than we all are aware of – is maybe the toughest big bear hug
that the recycling movement has to gain from the fast fashion cycle industries. So far it seems the only
way to bring the message to a wider spread audience. For recycled fashion many steps still have to be
made. All in all a tough call.

There is hope however. In the past fifteen years some research has been done by singular couture
houses like Paco Rabanne. Recently it is the house of Stella McCartney that opened up her personal
powerhouse and chain for a collaboration with Ethnical Fashion Africa by launching a limited edition
Recycled Faux Python bag. She nailed it. It was true fashion storytelling, it smelled like fashion, it looked
like fashion, it made you eager to have it and buy it. Also, it breathed the awareness of new times. A
small example but a significant one. Fashion may be an old-fashioned industry since it has moved and
shaken deliberately by an exclusion of the mass and a forceful lock embrace of the elite, but fashion is
also the first to acknowledge that a change has to be pursued.

My fashion intuition tells me that fashion has been waiting for the right moment to jump. Once it jumps,
it will steadily and surely rock the boat of recycling. Once more: in order to achieve that we have to cut
and paste in the current chain of development and overcoming the semantic discussion between
technicians and creatives is adamant.

The path of innovation is not an easy path. But the solution for the future lies within the roadmap that is
ours to create. Many green waves of development have paved a path in the turbulent seas of
innovation, but the next wave is around the corner and we better get ready and prepare ourselves to be
able to surf that wave.
Green economy and strategies for sustainable fashion
The Italian Environmental Footprint Program: the experience in textile and fashion industry.

Martina Hauser, Head of the The Task Force “Environmental and Carbon Foot Print” - Ministry for the Environment, Land and Sea

I lead the Task Force “Environmental and Carbon Foot Print”, that has been established by the Italian Minister for Environment in the framework of Europe’s sustainable and low carbon growth strategies Europe 2020-2050. The Task Force is promoting and testing pilot projects on environmental and carbon footprint in different sectors.

The first pilot project we worked at is called ‘Traces’. It involved the Italian Ministry for the Environment and the clothing company Osklen, a Brazilian fashion brand and also a cultural institution, in the context of the Italian-Brazilian cooperation which is in progress since 2004. This project is an example of ‘best practice’ of public-private cooperation between the public institution of a developed country and a private company based on an emerging economy.

The project aimed at giving an account of the social and environmental impacts in textile production, a sector which currently employs more than 30 million people in developing countries and contributes significantly to land, water and energy consumption, with one of the most important carbon and social footprint in the manufacture industry.

Working together, the Italian and Brazilian experts are addressing the complex linkages in the poorest areas to enable economic growth by protecting the environment and improving workplace conditions. Protection of the environment and social development should jointly guide the economic growth in the developing world.

This symbolic and innovative project between Italy and Brazil traced the carbon footprint and the social and environmental impacts of six Osklen products made of e-fabric sustainable materials: pirarucu leather, organic cotton, eco-jute canvas, recycled fabric, organic silk and recycled cotton and PET.

Experts from both countries crossed Brazil from North to South for months to study the supply chain of each of these six products from raw materials source to the end-of-life of the products. The purpose was to provide sustainable models, improve social initiatives and to evaluate greenhouse gases emissions, as well as to identify possible mitigation measures to minimize environmental impact.

The result is an innovative label that traces the whole production chain, from the raw material to the end of life of the product, together with the social aspects of the production. Tens of thousands of workers can benefit from these sustainable processes improving their quality of life.

‘Traces’ is a case study we are committed to replicate in Italy in the context of the national program for the environmental footprint that involves several economic sectors including some Italian companies in the textile and fashion industry.

One of the priorities of the national program is the promotion of voluntary actions within the private sector and public institutions in order to fulfill the mandatory commitments on the emission reduction: the voluntary actions applied by companies according to the agreements with the Ministry, combine the

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8 Martina Hauser dedicated her last 20 years to the development of hundreds of environmental protection projects, constructing ecological buildings, evaluating the impacts of private and public companies, as well as mapping the CO2 emissions from various productive chains with the Carbon Foot Print Calculator. In 1996 the Italian government sent her to Bosnia to assess the environmental and humanitarian effects of large-scale bombing during the war. Since her mission to Bosnia, Hauser has continued to work for the Italian government and now runs a range of projects in 48 countries. Within the Ministry, her Task Force offers companies around the world tools and advice on how to implement more sustainable production techniques.
carbon emissions reduction with the increase of competitiveness on the market. The Ministry launched several pilot projects in collaboration with the Italian productive sector in order to test and to promote different methodologies on the environmental impact of production and consumption patterns. Moreover, to increase the investments for sustainability in the Small and Medium Enterprises sector, the Ministry co-financed 22 companies through an open competition. On 25 January 2013 a new call for food companies has been launched.

In detail, methodologies and sustainability indicators applied in our analysis are: Life Cycle Assessment, Carbon footprint and Water footprint.

The LCA approach allows the evaluation of the industrial/productive systems life cycle ‘from-cradle-to-grave’. The analysis starts from the soil (collection of raw materials to make the product) and ends when all the materials return to the soil (End of Life).

Carbon Footprint is a tool able to provide the data of the exact amount of greenhouse gas emitted during all the steps of the production process of goods or services. The carbon footprint expresses in CO₂ equivalent the total amount of greenhouse gas emissions directly or indirectly associated to a product, an organisation or a service.

Water footprint is an indicator of the water usage that looks at both direct and indirect use of a consumer or producer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business. The global amount of water footprint results from the wide-ranging of blue, green and grey water.

According to the outcomes of the pilot projects already implemented by the Task Force in many sectors: agriculture and agro-industry, chemicals, food, ICT, retails, services (universities, motorways, transportation of goods), manufacturing (cars, coffee, fashion, mineral water), the Italian Ministry for the Environment is developing original and innovative methodologies and introducing best practices, based on the international UNI/ISO procedures. The Italian Ministry wants to share methodologies and best practices with the Member States and the European Commission, in order to contribute to the policy making process of the Union by adopting harmonised European procedures for environmental and carbon footprinting.

To give some figures of our work, we have so far involved as our partners more than 70 companies, 3 universities and 4 municipalities. Among them are brands as San Benedetto, Pirelli, Eataly, Lamborghini, L’Oreal and Carlsberg.

In the fashion and textile industry, we signed an agreement with four Italian brands: Gucci, Benetton, Brunello Cucinelli and Cruciani. Brunello Cucinelli goes annually to Mongolia and China to select the best quality cashmere. The further manufacturing process takes place in the workshop of Solomeo. These four companies selected the cashmere pullover as their main item for the environmental and social assessment analysis. Gucci selected several other products to be traced as well. Benetton chose the carbon footprint of two ‘kids’ products (t-shirts and polo shirts) and is developing a project to improve the energy efficiency of its Monastir plant in Tunisia. Benetton’s production in Tunisia is about 35 million items per year (about 30% of the total production per year). Cruciani will cooperate with the Ministry for the Environment through the creation of the Cruciani Green Innovation bracelet that will give the possibility to reach many consumers and to make them aware of environmental issues. These are pilot projects in the textile and fashion industry that represent a starting point in developing guidelines and best practices to foster sustainable patterns of production and consumption.
REMO: a transparent label for textile recycling

What is REMO?

Martin Havik, creator, owner and founder of REMO

I’m not going to talk to you about technical matters, about what REMO is, what we have done and what we are planning to do, as those after me will speak about that. I would like to focus a little bit on the philosophy of REMO, a philosophy that has fully involved me and my co-workers, and which I hope will involve you too.

Before working in the textile trade – which I have a good knowledge of, having spent many years in its different sectors, from sales and marketing to the industrial and production side – I used to be a professional cyclist, competing in many giri d’Italia and winning the team title in 1984 alongside the great Francesco Moser, who is also involved in the REMO project.

Although it is an individual sport, cycling has taught me that in order to win even the best riders must count on their team to pave the way, support them on the way up the hill and at the sprint finish.

Well, REMO seeks to be a united team, it wants to win by fully exploiting the skills and qualities of each team member. But to be a part of this team, you have to be well prepared and have specific traits. That is why we have created strict rules, allowing only those who meet certain requirements to join our team.

Naturally the number one goal in all this is to make the business a success, but that is not the only thing that matters to me, it is not the only reason why I have invested my time, energy and money in getting this project off the ground.

I am Dutch, but I fell in love with Italy and with the work of Italians. I know that in the textile industry Italian production is often almost a work of art, and that here in Italy there are firms capable of creating and doing what REMO is proposing.

This is why I have insisted on focusing on the textile district of Prato as a starting point. I thank the industrialists that have joined the project as well as the town authorities, first and foremost mayor Roberto Cenni.

Prato has always been accustomed to recycling wool and processing it to obtain yarns and fabrics that are then sold all over the world, proudly flying the Italian flag. What we intend to do is to begin the virtuous recovery and total recycling of not only wool but also cotton and other materials that will be made available to the textile industry. With the rules it has drafted, REMO will ensure the traceability of these materials all along the chain. I believe it is not hard to imagine that this process will be a strong impulse for many firms that are feeling the dramatic effects of a deep crisis.

For this reason, namely the economic crisis, which affects all of us, I would like to thank in particular the town of Almere, its mayor Annemarie Jorritsma and the town’s institutions who at such a difficult time

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9 After Martin Havik’s sport career ended (Havik was a famous cyclist who won the Tour of Italy with Moser in 1984), he started working in the textile industry in the Province of Prato. After years of experience in the fabric and fashion industry (for example for Scotch & Soda), Havik managed with his professional team to unite knowledge, innovation and passion in the company REMO (Recycle Movement). REMO promotes the recycling of fabrics and creation and sustainable production of recycled goods. The REMO label gives both the consumer and the reseller reliable and transparent information about the use of recycled fibres in the product.
have believed in what REMO is trying to do and have made an active contribution to the start-up of our project.

I must also thank the Dutch embassy in Rome and ambassador Michiel den Hond, who with his presence here today offers proof that we are on the right path, and despite many difficulties we are going down the road, full of confidence, towards the sustainable, “green” economy that has been spoken of so much.

A few weeks ago, visiting the Pitti Uomo trade fair, environment secretary Corrado Cini said that Italy’s textile industry (and we might add that of all countries) must try to grow by developing eco-sustainability, adding that he was monitoring the sector and seeking to bring together firms working towards that goal.

This is exactly what REMO is trying to be and to do. A certification system and a quality label for firms that espouse our philosophy.

You will probably know that for every kilo of recycled cotton the planet saves more than 3,500 litres of water and a large amount of pesticides and herbicides that would otherwise be harming the atmosphere. But that is not all. Thanks to REMO’s traceability system it will also be possible to reduce the discharge of CO2 into the atmosphere, as the recycling of fabrics could be a so called zero-mile technology, and if it is, thanks to the REMO track and tracing system, it will be certified and GUARANTEED. Thus both an ecological and economic advantage.

These are considerations that we need to reflect on. Through the traceability record, REMO seeks to connect firms that understand this, and that care not only about the business but also about our philosophy, which is alert to environmental issues.

Possessing the REMO label means saving resources which in the future can be reinvested in development projects.

This is another cornerstone of REMO’s philosophy: a portion of the revenue that will come in from rights and royalties as established by our rules will be reinvested in work projects, especially if young entrepreneurs are involved, that are consistent with the REMO project.

Just to sum up, and going back to our initial considerations, REMO is building an operational mosaic that seeks to optimise all steps in the chain, just as a cycling team is formed, in a bid for final victory.

Except here it is not one cyclist that will win, it is the environment, the sustainability of the economy, a new entrepreneurial culture in the textile industry, capable of doing the business, creating new jobs and trying not to deplete the resources of our planet, recycling and bringing back to life what is already in our possession.

**Recycle-Movement (REMO)**

REMO has developed an ICT solution, which makes it possible to track recycled fibres during the production process from unraveling to the end production of garments. This way REMO can calculate the percentage of recycled content in garments. This can be traced back by scanning a QR code on the hangtag of a garment made from REMO fabric. This transparent way of working also enables REMO to make calculations on the environmental savings (water, energy and Co2) when choosing recycled versus virgin material.
Track & trace
REMO approached Texperium (open innovation centre for textile recycling) for a solution which would increase consumer awareness regarding textile recycling. The paper of Henk den Herder (Texperium) shows the technical workings of the thought out system which is about to go live half of April, 2013. Summarized, members of REMO will need to record the input and output of their production process in a prescribed way so that all production lots are separately identified and the information is recorded in the REMO database. This process starts at the unraveller and the workflow continues to a spinner, a weaver and a confectioner.
At this last step a REMO garment is created. All information, necessary to trace back the recycled content in the garment and to show the environmental savings, is available and only needs to be unlocked. This can be done by scanning the QR code on the hangtag of the garment or inputting the code on the Internet on the REMO portal.
At this point it is clear that only the garments that have followed a workflow of including only REMO participants, can be traced. This will be covered further on in this paper.
A last important remark on the track & trace: our database solution is built by Zetes, a multinational, with over 30 offices in Europe, Middle East and Africa. Zetes also built the track & trace for DHL and is therefore a solid partner.

Future
At this moment REMO starts recording information at the unraveller. However, we are studying the possibility to already start recording in the collecting phase. The advantage of this will be that brands with own shops can offer garments which are made from collected clothing in their shops. This would mean that these brands would ‘close the loop’ and this is traceable in a transparent way. These brands have to purchase and use less virgin material, which results in a better environment.
Recording the sorted goods (after the collection phase) will have benefits for the whole chain as sorted lots will have a more uniform composition on type of material and colour, resulting in more valuable raw materials.

Added value according to REMO
It all started with the track & trace solution. However, REMO wants to add value to the chain and not only focus on customer awareness. As working with post-consumer recycled fibres is fairly new, REMO has worked together with a number of producers in the chain. REMO encountered two important bottlenecks in processing post-consumer fibres. The spinner can reach the best results making yarn if he knows what the composition is of the fibres delivered by the unraveller. Of course, the unraveller will give him an estimate of what is included when possible (e.g. collected workwear), but the composition is always difficult to estimate. Furthermore at the end of the chain the garments will be tested on toxic materials. With recycled fibres included in a garment there is a small chance that collected materials contain hazardous materials, as the exact origin cannot be traced. REMO wants to anticipate on potential problems further on in the chain and will test materials at the start of the process on composition and on hazardous materials (more on this later). This way the recycled content is save and the quality of the yarn will be high, as the spinner knows the composition. REMO believes that this will empower the chain.

Environmental savings
All input material, recycled and virgin, and output material are recorded in the different steps of the workflow. Based on this information two calculations are made on emission data. One for the garment containing recycled content and one for the garment containing only virgin content. For the latter
calculation, the spinner needs to specify reference material. The calculation itself is based on a life cycle analysis tool developed by MODINT, the Dutch trade organisation for textile and the CE Delft. The tool uses information from the Swiss Ecoinvent database.

**Participation**

With reference to the presentation of Francesca Rulli of Process Factory it is important to know that REMO will not, in any case, take over responsibilities of the manufacturers. REMO is not part of the chain but delivers an ICT solution, connection all REMO members in the chain. Potential REMO members are subject to a client acceptance procedure. This is a customer intake, which will give REMO information on the quality of the processes already in place to safeguard potential risks. Where possible REMO will rely on existing certification (e.g. ISO). The intake focuses on legislative requirements:

- People, Health and Safety Protection
- Environmental Protection
- Consumers and Quality of Products
- General requirements of Products
- Identification and Traceability
- Organisational Conduct

If there are areas where potential members have insufficient third party certification and documentation handed over is not robust enough, REMO will need to further investigate these areas, which is done by means of an on-site inspection. This is to verify the presence of necessary requirements.

REMO believes that with this client acceptance we will build a strong chain and therefore we all will benefit. It will be clear what REMO stands for and what REMO participants stand for, whether they have their activities in Europe or in another part of the world.

**Testing of recycled fibers**

With reference to the presentation of Primo Brachi of Laboratorio di Analisi Prove e Ricerche Tessili, the average consumer may perceive recycled materials as ‘hazardous’. The main reason for this is that the origin of the recycled material is unknown. This is also a risk for REMO. To mitigate this risk each batch of raw material will be analysed, by means of laboratory tests, to determine the fibre composition and potentially hazardous chemical parameters.

The results of the test performed are shared within the chain. This adds value for the spinner, as it will be easier for him to reach a high quality yarn: now he knows the composition and will need less effort to come to a good quality. Furthermore the rest of the chain is safeguarded from potential hazardous material in the recycled fibres. The test number is recorded in the database and will follow the relating batches throughout the workflow. The tests can be retrieved at the laboratory when needed.

**There is more**

Besides all matters mentioned above REMO wants to be broadly involved in stimulating to work with recycled materials. So its goal is not solely creating awareness and thus less waste and more environmental savings. REMO also wants focus on cultural exchanges between districts with high competences in recycling. REMO wants to be involved in education with respect to recycling and has already sponsored several activities. REMO will start a foundation in order to support activities in less developed countries, all in relation to recycling.
REMO: a transparent label for textile recycling

Modint EcoTool: life cycle analysis of products on CO2, water and chemicals
(MODINT vision on “Closing the Textile Loop” and the MODINT EcoTool)

Peter Koppel: Dutch Branch Organisation Modint, Zeist

MODINT is the Dutch trade association for manufacturers, importers, agents and wholesalers of clothing, including sports clothing, fashion accessories, carpets and textiles for interiors. MODINT has approximately 750 business members. These businesses are involved in the production and/or trading of clothes, fashion accessories, carpets and textiles for interiors. The businesses have a combined annual turnover of €9 billion in the Netherlands, of which roughly 45% is exported.

Corporate Social Responsibility and Sustainability

There is a difference between looking and seeing, between hearing and listening, between talking and saying. The question that becomes more important with every turn of the earth is how long we can continue to look, hear and talk without saying, listening and seeing. That the way in which a large part of the human species is dealing with the earth it lives on is not sustainable. That our way of life disrupts and offsets the balance which is needed if one wants to provide a future for next generations. The evidence is abundant; to a large extent because of rapid developments in telecommunication technology. Internet makes the world transparent, although we may not like what we see. Often, looking so carefully in the mirror that is being upheld in front of us that we actually see what is going on hurts. It hurts when you realise which patterns of behavior we must change in order to make the change towards corporate social responsibility and sustainability. It is not easy to cope with the fact that the way in which we have defined economic prosperity is no longer adequate to manage our future, because it becomes clearer and clearer that vital elements are not taken into account in the equations we use when calculating our wealth or growth.

CSR a necessity

Especially the decline of the value of the natural resources of our planet and all ecosystems present has been neglected. Our economy has been based on linear processes rather than circular ones. Mistakenly assuming that we could endlessly ‘take’ from the earth, we have – albeit: unintentionally! – created an unsustainable atmosphere. An atmosphere in which the necessary balance between ‘it’ (meaning: whatever we do), ‘I’ and ‘us’ is destroyed – or being so shortly. An atmosphere in which short term interests have become so predominant that sight on a longer time horizon is being blocked. An economic structure in which too much energy is being put in privatising profit, leading to costs being put to society. For MODINT it is clear that change towards corporate social responsibility and sustainability is becoming less and less an option – and more and more a necessity.

10 Since 2008 Peter Koppel is active as manager sustainability and innovation at Modint, the Dutch trade association for fashion, interior design, carpets and textiles. From 1999 – 2008 he worked as senior consultant Cleaner Production and CSR for IVAM, an independent research and consultancy organisation for sustainable development of the University of Amsterdam. From 1988-1995 he was active as researcher and consultant within the Erasmus Centre of Sustainability and Management of the Erasmus University (Rotterdam, the Netherlands). In 2012 Modint organised in cooperation with the Dutch Embassy in Rome the presentation of a market research study ‘Opportunities for Dutch fashion labels in Italy’, as well as a trade mission to Prato, focusing on innovation, recycling and outsourcing. Koppel represented the Dutch trade association during these events.
Questions to be answered
To realise change is a necessity is, in fact, only one part of the solution. It may even be the easiest part. For how do you define ‘social responsibility’ or ‘sustainability’? Where does it start and where does it end – if it ends at all? How to differentiate between what is ‘good’, or ‘true’ in this respect, and what is ‘wrong’ or ‘false’? How to make the change – or even start it? What does it encompass, what does it costs, what are the risks involved and how to avert those risks and transform them into profitable business – but now in a way that lasts longer?

For many people who bear responsibility for, or within, companies associated with MODINT, the above is not new. They have not only looked into the mirror, but seen what is there to see. And they have taken action. They started analysing their way of doing business, looking for options to change. They discovered that it is not only possible to effectuate change in the way they run their business, but that responsibility and sustainability can very well be matched with economic profit, still very much needed for any company to survive.

Making the change
Think about a linear economy in which there is no reuse nor recycling of metals, paper, glass. How many millions of tons of waste should be dumped, stored or incinerated. What a waste of useful materials that would be! Actually that is largely the situation for garments. Basically a linear textile life cycle without the real recycling block is practice. In the Netherlands only, yearly more than 200.000.000 kilo (200 kiloton) would be wasted if the life-span of garment textile would not be prolonged. About 70 kton of garments are separately collected and either worn again (2nd-hand, 60%), cut into cleaning rags (20%) or thorn into coarse fibres and yarns for felt, filling and isolation material (13%). A left-over of 7% too dirty but for waste incineration. But that’s also the fate after secondhand use, cleaning rag and felt-use. In a critical – or even cynical way - you could say that the existing reuse is merely a ‘postponement of execution’. After all the textile material will end-up in a waste incinerator or land-fill, and with the secondhand charity business very often in Eastern Europe and Central Africa where the waste management practices are way below the (North-West) European standards.

Taking a close look at the life cycle the essence of ‘closing the loop’ is ‘minimizing virgin input’! In such a way that the base material, textile fibres, can be used for textile products at a highest possible level again and again, or as it is stated in the MODINT Recycled Fibers factsheet: from virgin to eternity.

This is the big challenge for the textiles industry, to join the metals, glass and paper industry in closing the loop, like the plastics industry is also working on. These materials are all commodities that are widely used in construction, transport, packaging, business and consumer products. All with its very own specific characteristics for the products and their duration of use, for the way they are disposed of after use and for the technical possibilities to be recycled. In a way you could say ‘metals are metals, easy to separate’, ‘glass is glass’, ‘paper is paper’. Of course it’s not as simple and easy as that, but by no means as complicated as with plastics and textiles. Speaking for textiles there is a wide variety in fibers, from the big naturals, cotton and wool, via the half-synthetic viscose (if to be invented today it would be framed ‘bio-based’ on wood!), to the full synthetics like polyester, nylon and acryl. And that is only the fiber variety. Fibers can be blended either on fiber, yarn, cloth and garment level, and of course all these blends are mixed-up in the waste collection bin after use.

But the good news is that there is a garment sorting industry existing in function of the secondhand loop. And this industry is performing increasingly innovative with the largest automatic sorting machine
(on fiber type and colors) installed in the Netherlands. Also the most advanced unraveling equipment is
developed and operating in the Netherlands. With a sophisticated fine unraveling process, high grade
and well defined fine fibres can be generated and used for (re)spinning again. This counts for general
consumer garments and even more for workwear garments. The latter type can be collected very
specific on type of garment and composition and can be pre-treated carefully (f.e. sewn-in labels
removed to prevent white spots) in order to get a well-defined input in the unraveling and an even
better homogenously mixed output of regenerated fibres for spinning.

At the spinning stage it is very important to make smart choices for the right mix of regenerated fibres
with virgin fibres above going for 100% recycled. For textiles, the 100% recycled aim is largely limited to
the synthetic ones which can be recycled in a chemical way and thus made into a qualitatively virgin
fibre again, this is already done for nylon (fishing nets and carpet yarns) and is a perspective for
polyester and eventually viscose (and even cotton, being a cellulose fibre too). But in the mechanical
unraveling, fibres will always lose some fibre strength and length quality. So a virgin quality input will
always be needed. That needs not to be a problem because closing the loop for 50 to 80% will reduce
the virgin input of fibres with the same percentage. And that generates already a tremendous
environmental benefit.

This environmental benefit can be calculated with the MODINT EcoTool . The EcoTool calculates five
environmental impact categories throughout the whole lifecycle of a textile product: (1) energy
consumption, (2) climate effect, (3) water use, (4) chemical use and (5) land use. In the recycling
calculations for the REMO recycling system, at the moment the carbon and water footprint are the ones
calculated and energy-use.

The MODINT EcoTool is a LCA-based spreadsheet. One could say that it executes a screening LCA,
making use of generic fiber, process and manufacturing, transport, washing and maintenance and final
disposal data. For a full-product-specific-LCA very detailed and specific information is needed about all
life cycle stages. In the MODINT EcoTool most of the calculation is done with generic, validated data.
And there is no final overall score due to the incomparability of the environmental impacts. Besides,
there are a few disputed issues on LCA methodology in the field of textiles, largely related to the land,
water and carbon footprint of the natural fibres.

The natural material wool shows a very bad LCA performance largely due to land use and climate
impact. Land use everyone knows, but what is the ecological damage of grazing flocks of sheep on
wastelands of New Zealand, the hills of Wales or the dikes and polders of Texel and the Netherlands?
It’s a hard talk to tell the farmers and nature lovers that that’s not sustainable! To understand the
climate impact you’ve got to know that these sheep bleat and fart methane – a digestion gas from their
stomachs (same as with cows) – which is 25 times more harmful greenhouse gas than carbon dioxide
(CO₂). Also cotton scores very poorly, mainly on water and land use. It’s indeed hardly disputable that
cotton cultivation takes huge areas of land just as big volumes of irrigation water (the natural disasters
that can occur have been demonstrated by the vast cotton fields near Aral lake in the former Soviet
Union). With organic cotton these parameters can even be worse, certainly for the land occupation due
to the lower crop yields per hectare. For water use it fully depends on the balance between water use
and supply. In rain-fed cultivation the irrigation demand is fully met by the amount of rainfall. But in
most cotton growing regions the water availability is (much) less than the water demand of the crop,
leading to a water depletion of local sources.
But the big issue for cotton is the high dependence on crop protection chemicals (pesticides) in the intensive cultivation (leaving apart the GMO – genetic modification – issue). Whether or not cotton still counts for 25% or in the meantime 15% of the yearly world-wide agricultural pesticides use, it anyhow counts for a vast chemical footprint with direct ecological impact (other than process chemicals which basically can be well controlled in state-of-art equipped and managed textile mills). With mentioning the chemicals we touch a flaw of the MODINT EcoTool to be improved: a more toxicological and ecological weighing of the different chemicals (from pesticides to caustic soda) in the textile chain.

Nevertheless LCA-based evaluations with the MODINT EcoTool undisputedly points to the environmental benefit of recycling, making closing-the-loop to a ‘no-regret’ approach, not to say a ‘conditio-sine-qua-non’ for a sustainable textile circular economy!
REMO: a transparent label for textile recycling

REMO-key: tracking and tracing of recycled material

Henk den Herder, Texperium Open Innovation Center for the textile industry, Haaksbergen

Why Recycling matters

In the past consumer buying decisions were mainly based on fashion trends and price, nowadays we see a growing interest in ‘honest’ clothing. Consumer awareness is growing. Questions are asked about environmental impact, the working conditions in factories, competition for scarce resources, etc. Consumers say they take these issues into consideration when buying.

The textile industry has responded by making these issues part of their procurement decisions, which shows in the quantity of ECO labels that are appearing on clothes in the shops. However, the multitude of labels (a few minutes of google search turns up more than 100 different ones, some useful some nonsensical) do not really provide any useful product information to consumers.

Practice shows that this product awareness has not really been translated into consumer behaviour. The average lifetime of a garment is 3 years, after which more than 80% is dumped in landfills or disappears in the incinerator (In The Netherlands alone we produce > 200.000 ton of post consumer textile waste annually). Also fast fashion is an important market force that may indirectly lead to a further reduction in garment life time.

... So much for sustainability.

Development in recycling techniques makes it possible to use recycled fibres in quality garments. Our estimate is that this will in due time at least double the life time of the textile fibres in (multiple)garments.

The conclusion that industry push (fast fashion) and market awareness (and the current economic situation) are conflicting forces seems obvious. In our opinion recycling can to some extent resolve this conflict.

REMO aims

REMO approached Texperium (the open innovation centre for recycling of textiles) to help reaching their aim of promoting textile recycling and the development of their business.

After ample discussions we arrived at the conclusion that an important step would be the promotion of consumer awareness. This should be done through the provision of relevant, transparent and reliable information about garments. Current ‘Eco-labels’ normally lead you to extensive websites providing lots of information about the certification systems that provide the basis for the label. Whereas this is of interest to the Textile industry, it does not provide the consumer with any relevant information. The reason is that it does not quantify in any way how his purchase decision improves the Planet, or what the relative advantages of one label over the next are.

Based upon these considerations we decided to develop a simple system that would tell the consumer the real story of their clothes (at least the part that has to do with recycling). A further aim was that this system must be simple in concept and simple in use in the textile industry.

11 Henk den Herder is an independent interim manager and consultant. As owner of Den Herder I&O he provided his services to several companies and educational institutions, mainly in the East of the Netherlands, ever since 1999. In the period 1974-1999 he held various international positions with Shell and NAM (Dutch Petroleum Company). Starting from 2010 Henk den Herder acts as consultant and project leader to the Foundation Texperium, the Dutch open innovation center for high-value recycling of textiles. Henk den Herder graduated from Twente University.
The key
Based upon these aims and requirements Texperium developed the REMO-key and the REMO-key system.
The REMO-key is a unique label attached to the garment that provides access to all relevant information about the recycled fibres used. It will tell you the exact environmental savings realised by producing a garment containing recycled fibre compared to a similar garment made of virgin fibre. The information includes reductions in CO2 emissions, energy use and use of water. On top of this, the key provides access to the production trail of your garment by giving you the detail of used recycled material and used virgin material at every step along the production chain. Access to this information is through scanning a QR code on the label that instantly shows you the information on your smartphone. Alternatively you can access the information via the internet using the unique numerical code given on the key.
In principle this system will allow the consumer to compare various garments on offer at the retailer and select the one that has the highest environmental savings.

### Your contribution to a better environment

<table>
<thead>
<tr>
<th>Environmental Saving</th>
<th>CO₂ (kg)</th>
<th>Energy (Mjoule)</th>
<th>Water (liters)</th>
<th>Reference Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>per kg product</td>
<td>23</td>
<td>158</td>
<td>219</td>
<td>40-40-20 Viscose-.Polyester-Wool (undyed)</td>
</tr>
</tbody>
</table>

### Production history of your garment

<table>
<thead>
<tr>
<th>Production step</th>
<th>Produced by</th>
<th>Production date</th>
<th>Quality ¹</th>
<th>Fibre composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garment tailored</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garment knitted</td>
<td>Le Noir</td>
<td>jan-2012</td>
<td>REMO-40</td>
<td>40% viscose, 20% rec wool, 20% rec. polyester, 20% PET</td>
</tr>
<tr>
<td>Cloth Woven</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yarn Spun</td>
<td>GM Filati</td>
<td>nov-2011</td>
<td>REMO-50</td>
<td>25% rec. polyester, 25% rec wool, 25% viscose, 25% PET</td>
</tr>
<tr>
<td>Fibers unravelled</td>
<td>VAR-Frankenhuis</td>
<td>Sept-2011</td>
<td>REMO-100</td>
<td>50% rec. wool 50% rec. Polyester</td>
</tr>
</tbody>
</table>

¹ Quality is defined as percentage recycled fibre in product. e.g. REMO-50 contains 50% recycled fibre

### Environmental Savings
As indicated before, the environmental savings can provide important and relevant information for consumers. REMO-key calculates these savings through a comparison with a reference material.
Therefore 2 sets of emission data are calculated; one for the material containing recycled fibre and one for the reference material containing all virgin fibres. This is done at the spinning stage, because at this stage the most relevant comparison can be made. In the process the spinner is asked to provide the REMO-key system with a reference product. Possible additional savings caused by leaving out bleaching and dying steps further on in the production chain are not taken into account. Therefore the calculated savings are a realistic minimum. Actual data are calculated using a life cycle analysis tool, provided by the Dutch textile trade organisation Modint. The tool was constructed by CE Delft and uses data from the database provided by the Swiss Ecoinvent organisation.

Environmental savings

- based on ‘Ecoinvent’ data
- savings related to the fibers only (source material for spinning)
- additional advantages (bleaching, dying, etc.) not incorporated
- Energy / Water / CO₂ / fertilizer-chemicals
How the REMO-key system works
REMO-key takes into account every step in the production chain from unraveling until manufacturing (tailoring/knitting) of the final garment.

In every step of the production chain we monitor the mass balance and we provide data about the type of materials added. All products throughout the production chain are individually tagged and the data centrally stored. In this way we can ensure complete reliability of the end product; the product information and production trail, which is accessible through the REMO-key. What activity is required from producers in the chain?

There are 3 transactions that must be performed by every producer.
- a PC based transaction at the moment of production preparation
- 2 transactions, on the shop floor, using a handheld terminal or scanner, one at the start of the production run and another at completion of the production run.
All transactions are carried out through a set of very simple data-entry screens. In general, all data required for REMO-key are already available in the normal planning or work preparation processes that are in place in every company.

To give an idea, some of them are presented below.

**Planning:**

The producer starts with the identification of a batch (normally an existing production batch number) and subsequently inputs the product to be made, the product type, the product quantity and the individual components that make up the product. In the case of the Spinner, also reference product data are entered. As an example the screen for inputting the source material is given below.
Production start:

The producer selects the appropriate batch number and scans the REMO input material. Checks are made to ensure quantities are in line with the previously made batch plan. Scans of the REMO material are taken with a handheld scanner that can fast and accurately read he RFID tags that are used by REMO-key. The scan results will be shown on the handheld-screen.

Production completion:
At completion of production the producer will attach a REMO-tag per packing unit or a REMO-key per garment, scan the unit and confirm or modify the weight. All REMO-tags are provided by REMO B.V. and are preregistered in the REMO key system. Only preregistered tags can be used in the system.

The example shows the result of the scanned packing units. The weights are calculated on the basis of the pre-entered plan, but can be modified if so required (e.g. in case of production losses) In the example this is done for the one but last item in the list.
As mentioned before, the tags used are in principle RFID-tags that allow easy scanning, also in large quantities. When circumstances so require, a cheaper 1-D barcode system can also be used.

**Technical Requirements**

Technical requirements to operate the REMO-key system are:

- Access to the internet, because the transactions require online verification with the REMO-database
- WIFI coverage in the production facilities is needed because handheld terminals will be used on the shop floor
- Handheld terminal/tag reader, brand Nordic, to be purchased through Zetes
- Limited staff training, user guide and instruction to be provided by REMO B.V.

In principle the REMO-key system does not require any further administrative effort from the user(producer), because all transactions will be carried out online and all required checks to ensure the reliability and integrity of the data are build-in. This implies that the user will not have to keep any paper trail and consequently there is no need for audits related to the use of the REMO-key system.

**Cost and Support**

Except for the cost of the handheld terminal there will be no capital outlay required. System support, maintenance and operating costs will be recovered through the charge for the REMO-key. An access fee, covering system implementation and initial training will also be charged. Initial training will be taken care of by REMO staff. All system support will be taken care of by Zetes, who have representatives in most European countries and also provide a help desk if so required.

**Advantages**

To summarize, the advantages for the Textile Brands (and the consumer) are:

- added value to the product through the provision of relevant, transparent and reliable product information to consumers
- a unique trail for every garment. For the textile producers in the chain the REMO-key system will remain very simple to operate meaning;
- no additional paperwork
- no consequential audit requirements, follow from the use of REMO-key
- no capital investment, only operational cost for the REMO-tags

**Availability & Planning**

Current development:

- The REMO-key system is under development by Texperium and Zetes (1 in The Netherlands)
- Acceptance test in February/March
- Implementation at launching customers from mid-April
- REMO-key available to consumers mid-2013

Possible future development, depending on user requirements:

- extension of the chain (collection)
- data-mining
- product authentication & signaling of possible counterfeiting
REMO: a transparent label for textile recycling
Advantages and shortcomings of recycling of textiles, quality control of REMO products

Primo Brachi, Laboratorio di Analisi Prove e Ricerche Tessili, Prato

Recycled products are perceived by the average consumer as ‘hazardous’; REMO must not and does not want to take the place of the producers in guaranteeing respect of the regulations, but it is fundamental for it to safeguard its image and the values it stands for, preventing as much as possible the arrival on the market of non-conforming products bearing its trademark.

This type of approach meets the needs of the manufacturers, in any case, as they will view REMO as an active partner for the safeguard of their interests and those of the consumers.

It will also be a safeguard for REMO with regard to its competitors.

Laboratorio di Analisi Prove e Ricerche Tessili
The work of Laboratory becomes part of the factory process, in that it implements, within the sphere of the trademark regulations, the sector of ‘tests and controls’.
In particular, therefore, the trademark regulation includes a section, entitled ‘Annex A’ devoted to tests and controls, summarized in the Operating procedure relative to tests and controls of products bearing the REMO trademark; this procedure serves to limit, as much as possible, any product non-conformity.

Product conformity
Product conformity is represented by respect of the cogent regulations referring to:
- standards of information for the consumer,
- standards for the safeguard of consumer health and safety referring, in particular, to the chemical risk.

Cogent regulations
Consumer information:
- Regulation UE1007/2011 relative to the names and labeling rules for textile products,
- Legislative Decree no. 206 of 6/09/2005 known as the Consumer Code, which provides the ‘instructions necessary for proper use of the product’.

Health and safety:
- Regulation UE 1907/2006 concerning the registration, evaluation, authorization and restriction of chemical substances, commonly known as REACH,
- Directive 2001/95/CE relative to the general safety of the products.

12 Primo Brachi graduated as industrial textile expert, he is the owner and director of Laboratorio di Analisi Prove e Ricerche tessili, established in 1977. The laboratory is one of the most famous textile laboratories in Italy. It is accredited ISO 17025 from Accredia since 1998 and it carries out textile tests for the major fashion brands. The laboratory is partner of Bureau Veritas. Recently a new site was openend in China. Primo Brachi is part of CCCI for cashmere analysis (The Cashmere & Camel Hair Manufacturers Institute is the leading authority on domestic and international issues concerning these luxury fibers and advises on labeling, international standards, supply and market trends.) Primo Brachi is also member of numerous textile research committees organized by UNI (Italian organisation for standards).
Knowledge of the fiber composition of the raw material and of the processing methods undergone by it will make it possible to assess the chemical risks and at the same time give the manufacturer information for correct labeling. It will be necessary to ascertain the fiber composition of every lot of raw material used.

This will also be essential in order to:

- Ensure correct composition labeling,
- Perform the calculation of energy savings.

**The manufacturing process and chemical risk management**

It has become essential to examine all the manufacturing processes, in every stage, in order to identify those operations that could represent a risk for the conservation of the quality of the finished product. The result of this work is the production of all the flow diagrams of processing stages, obtained using the computerized process modeling software ARIS, indicating the proper control methods for each «hazardous» stage.

Knowledge of the fiber composition of raw materials and the risks connected to the processing methods that they will undergo, enables us to assess the chemical risk relative to the products. This will be done taking account of the Table for chemical risk assessment.

**Tests, control and traceability**

As a general principle:

- Every lot of raw materials will be tested in the laboratory to determine the fiber composition and potentially hazardous chemical parameters.
- During audits, every company that contributes to the processing of the products bearing the REMO trademark shall provide documentary evidence that the dyes and processing aids used comply with the cogent regulations.
- REMO retains the right to take samples of dyes and processing aids from the manufacturers’ premises to verify their conformity using laboratory tests.

All test results and the results of audits will be recorded in data banks that will ensure the transparency of REMO’s operations.
REMO: a transparent label for textile recycling
Sustainable guidelines for participating in REMO

Francesca Rulli, Process Factory, Florence

REMO is a guarantee system for the recycled product, based on:
- a tracking system (REMO-key) with environmental saving calculation,
- a Protocol for companies that enter in REMO.

The Protocol aims to ensure the use of IT system for tracking and calculating the environmental savings, complying to REMO requirements of the company and its products.

The principles which moves REMO (declared in the ‘Specifications’), are:
- Ensure the Consumer,
- Work for the SUSTAINABILITY thought a clear project focused on social, environmental and economic values, ensuring transparency and traceability,
- Protect the planet, reducing waste,
- Create a cultural exchange between countries and districts with similar skills for joint growth.

REMO requirements are:
- entry requirements in REMO for companies operating in the textile sector,
- product requirements and processes,
- methodologies to verify the above requirements,
- product tracking and environmental saving methodologies.

These requirements are applied to organisations or companies that produce and commercialize recycled products, starting from secondhand dresses, ‘post-consumer’, consumer waste, leftover store or unsold products and provisions for public or private sector (uniforms, blankets, etc.).

The organisation or company will declare to comply with national laws, national collective labor contracts or agreements, international conventions and all the other applicable laws.

The organisation or company is committed to protect the people and safeguard health and safety through adherence to the principles characteristic of social responsibility such as the prohibition of child labour, the prohibition of forced and compulsory labour and providing a safe and healthy workplace.

The organisation is committed to be in compliance with the provisions of the mandatory rules relating to the environment, particularly in relation to:
- use of water,
- emissions into the atmosphere,
- industrial waste management,
- logistics and transportation.

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13 Francesca Rulli graduated as business economist from the University of Florence (Università degli studi di Firenze) in 1998. Between 1998–2006 she was active as quality manager and as consultant for several companies among which Engineering Ingegneria Informatica SpA, the leading group in Italy in software and information technology services. Rulli is co-owner and project manager at the company Process Factory, based in Florence, Italy. The company is focusing on management consultancy, change and process management, project management, compliance and sustainability development processes for clients in various sectors. As from September 2012, Francesca Rulli acts as Sustainability Manager for REMO.
The use of the REMO system is allowed for products whose content is at least 25% recycled. According to initial evaluation, REMO defines laboratory tests required to establish the content of the recycled material. And in accordance to risk analysis on production processes (regarding quality and safety of the recycled product), REMO has defined all the laboratory tests that the producer must provide for product conformity.

The organisation or company is committed to comply with fair practices in the conduct of business, and to ensure the safety and quality of the goods provided. In particular it will make sure that the products comply with all mandatory and voluntary standards laid down in respect of health and safety of consumers. The organisation or company will provide correct information concerning the composition, origin, treatment and control of the product, in order to enable consumers to make responsible decisions.

The organisation or company is committed to comply with the requirements of the product in accordance with regulations, and to identify the main production processes, managing and monitoring them to guarantee the quality of the product. In particular it will:

- ensure the effective functioning and adequate monitoring of production processes,
- support the operation and monitoring of the processes ensuring adequate availability of resources and information,
- ensure control over any outsourced processes.

The following main processes are taken into account: collecting, sorting, unraveling, spinning, weaving, dying and finishing, confectioning and retailing.

Any product that uses the brand name REMO ensures:

- controlling at the start of the process,
- homogenous lots of recycled material,
- sample tests,
- proper management of production batches,
- encoding at all stages of production up to the finished product.

The organisation or company must commit to conduct ethic business and shall make a reasonable effort to ensure that the requirements of the ‘Specification’ are being met by suppliers and subcontractors within their sphere of control and influence. Moreover it must commit itself to create a climate of collaboration and growth of the community of which it is part.
Investigating and promoting synergy between Italy and the Netherlands

Foundation Casa della Sinergia - House of Synergy - unites the best of Italy and the Netherlands.

Casa della Sinergia promotes and facilitates the collaboration between Dutch and Italian companies, institutions and professionals. The Foundation focuses on sustainable innovation in the fields of textiles & fashion, design, food production & food quality, and cultural heritage.

When people work together toward a joint goal, they can accomplish something larger, greater, and with more impact than something done in isolation. Casa della Sinergia is committed to promote collaborations that offer added value for companies and individuals as well as for society at large.