

## Textiles Briefing Paper

1.1 This paper summarises the Textile opportunities in Hampshire required to meet the Vision of the MRS.

This is based upon the best information discussed at the 31st March 2004 workshop and through discussions held in April and May 2004.

The Opportunities outlined below are the results of discussion with industry experts and detailed research into the topic. This research is summarised in the following pages.

The Information contained within this briefing paper will develop following this consultation into one section of the Material Resources Strategy.

This paper also links to the follow other papers:

- **ELVs (although only marginally)**
- **Bio waste**

### 1.2 The main opportunities to meet the MRS Vision

**The most important issue to achieve the MRS vision for textiles is the need and importance of mind set changes of all key players. In order to create opportunities for the MRS vision it is important to be aware that it can only be achieved properly by changes in lifestyle and realising where the problems really lie.**

The MRS vision for textiles has to be seen in a global context and cannot be dealt with in isolation. Global textiles issues have huge impacts on an EU, National, Regional and Local level.

To outline the opportunities for the MRS vision an awareness of the problems before discussing the actions is crucial.

#### 1.2.1 Globally:

##### **Problems:**

- Textile manufacture migration
  - More and more manufacturers are migrating to cheap labour countries.
- Surge of 'value for money'
  - Increasing number of shops offer low quality for low prices.
  - These garments are difficult to reuse as the product does not last. Developing countries want good quality material that will last for a few years otherwise they will have a waste and disposal problem.
- The recycling market for textiles in the UK has gone and it is becoming a global issue.

### **Actions to take for the MRS vision**

- Lobbying on global textile issues

### **Lobbying to get it onto the agenda for the next World Environment Summit in 2012 or earlier at one of the interim meetings**

#### **1.2.2 Europe:**

##### **Problems:**

- New EU legislation brings changes in various areas concerning textiles
- New trends in market development created through the expansion of the EU
- No funding available for R&D and not enough research has been done for secondary use of textiles

##### **Actions:**

- The MRS partners should liaise with other European and International companies to develop an integrated approach especially as a lot of manufacturing is done outside the UK and Europe. The Rt Hon Margaret Beckett, Secretary of State for Environment, Food and Rural Affairs said in a speech at the Environment Forum "I see integration of our environmental goals into other policy areas.... Many of our most important challenges - levels of carbon emission, waste, resource use and biodiversity - cannot be achieved in isolation."
- EU to put in place the acceptance of EU Eco label in all member states
- Same priority for resource use as other environmental issues
- R&D funding needs to be made available by EU and National Programmes. In the same speech at the Forum The Rt Hon Margaret Beckett said "But most importantly, we must improve the synergies between Europe's economic and environmental strategies. That means promoting environmental innovation and technologies."

#### **1.2.3 Nationally:**

##### **Problems:**

- No strategy for textiles in the UK
- No development on secondary use
- No action plans for textile in WRAP's waste programme
- Only industrial textile (technical textiles) use companies left in the UK due to the migration of other textile manufacturers

##### **Actions:**

- The MRS partners should lobby government for changes in policy on managing textile resource.
- The MRS should lobby producers and the textile industry through e.g. British Retail Consortium (BRC) to encourage a more sustainable approach to textiles
- The Government needs to support further research into processing such as the integration of industrial processes to use a mixture of virgin and

secondary resource as well as new markets associated with recycled textiles. They need to address issues of public perception to increase the number of uses for recycled product and to provide more stable markets.

- The MRS partners should work with national organisations to highlight the need for greater textile recovery.
- Trade organisations to establish clarity about resource stream

#### **1.2.4 Regionally:**

##### **Problems:**

- Regional opportunities with national issues

##### **Actions:**

- The MRS partners should support the textile industry to improve technologies and practices to deal with unavoidable textile waste.
- Regional agreement of an action plan regarding processing of textiles
- The MRS partners should keep a close working relationship with SEERA, SEEDA and other relevant organisations in order to maximise the opportunities for infrastructure development within the county and to ensure that the right methods are introduced.

#### **1.2.1 Locally:**

##### **Problems:**

- Lack of awareness regarding textiles from the general public and key players such as councillors

##### **Actions:**

- Communities need to be more aware of issues involving textile resource management and monitoring.
- The MRS partners should work closer with retailers and manufacturers to adopt and publicise the voluntary Eco labels for clothing
- Local Authorities need to understand the problems of textile recycling and should encourage and build new partnerships with relevant organisations for most efficiency and effectiveness
- Invest in local R&D requirements
- Moving the issue across party and remove political issues

**What is the current Textiles resource situation?**

#### **2.1 General**

The term '*Textiles*' relates to a number of items made up of man-made (also called technical textile) and natural fibres, which are used in a variety of functions. Such objects include clothing, curtains, blankets, and household

linen as well as shoes, belts, upholstery and handbags. 'While the textile industry has a long history of being thrifty with its resources, a large proportion of unnecessary waste is still produced each year, much of which is either incinerated or disposed of in landfill' (Waste online, 2004).

Textile wastes take many forms and are often complex in nature due to the range of manufacturing specifications required. There are two main groups of waste textiles

- *pre-consumer waste* which comes from the processing of raw materials and production of finished textiles and garments,
- *post-consumer waste* which include discarded clothing and other textiles.

Under part II of the Environmental Protection Act (1990), textiles are considered as a 'controlled waste'. Details on the collection, disposal and treatment of controlled wastes are specified under the Act.

## **2.2 Sources and types of textile waste arisings**

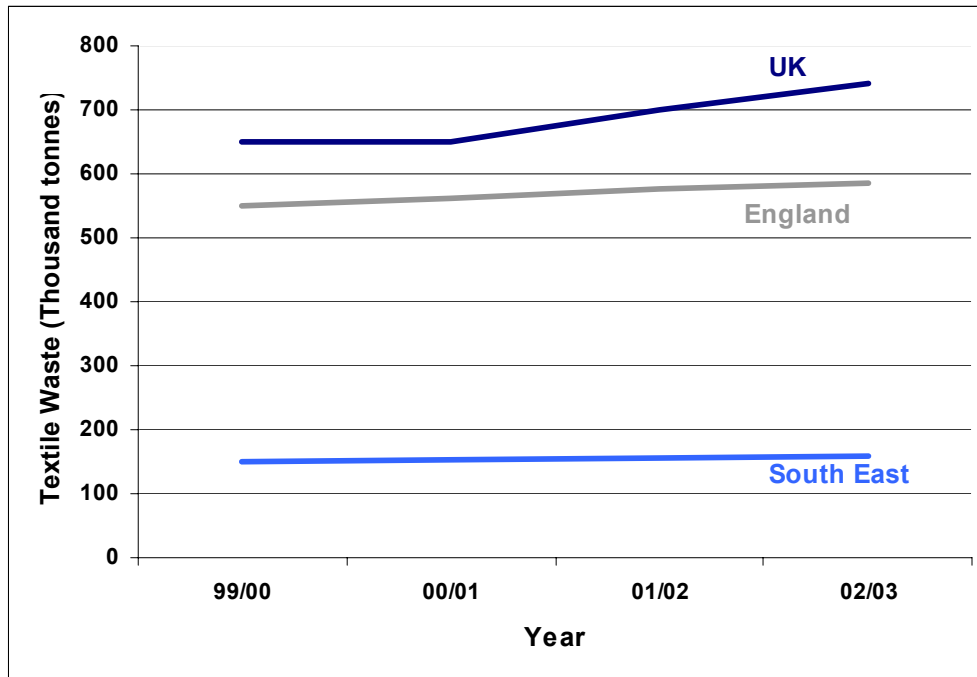
Textile waste arisings originate from both the household (consumer) and the industrial (manufacturing) sectors.

- Consumer waste generally comprises binned waste or that separated for reuse or recycling, such as unwanted clothing, household linens and carpets. The majority of waste textiles generated in the UK arise from household or post-consumer sources
- Manufacturing waste originates from the processing of raw materials and in the fabrication and production of finished textiles and garments, including cuttings and rejected materials. An estimated 10% - 20% of fabric waste is produced during garment production and between 6% - 20% of knitting waste in shaped knitwear or cut and sew manufacture. Other industries such as carpet manufacture produce 1.6 Million tonnes of waste each year in Western Europe.

The level of textile waste is rising in the UK, South East and Hampshire. The level of arisings is dictated by a combination of factors according to the DTI. These include:

- the rate at which consumers buy new clothes (affected by both the season and the health of the economy);
- the quality of new clothes on the market which dictates how soon they will require replacement;
- the rate of change in fashion markets;
- the amount of effort it takes to recycle the clothes.

## Household Textile Waste Growth in the South East, England and the UK 1999-2003



<sup>1</sup> Values for the UK were derived from household waste data provided by DEFRA available at <http://www.defra.gov.uk/environment/statistics/waste/download/pdf/wrtb01.pdf>. Values for textile waste were calculated using an estimated value of 2% textile portion of household waste given by the Environment Agency's National Household Waste Analysis project carried out in 1999.

<sup>2</sup> Values for England and the South East were derived using total household waste data provided by DEFRA available at <http://www.defra.gov.uk/environment/statistics/wastats/bulletin/mwbtb01-200203.pdf>. Textile waste values were calculated using an average value of 3.35% of household waste.

The Commercial and Industrial sectors are also key generators of textile waste. However, the lack of data on these sectors means the proportions of textiles wastes produced in Hampshire is unclear.

### Current Legislation

- Environmental Protection Act (1990)
- Landfill Directive (1991/31/EC),
- Controlled Waste Regulations 1992.
- Supervision and Control of Transfrontier Shipments of Waste 1994
- Landfill Tax Regulations 1996
- Producer Responsibility (Packaging Waste) Regulations 1997
- Waste Minimisation Act 1998
- Pollution Prevention and Control Act (1999),
- EC Solvents Emission Directive (Directive 1999/13/EC)
- Directive 2002/61/EC (amending Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (azocolourants))

## What is being recovered now and what infrastructure is in place

### 3.1 Current Resource Management

Used textiles are classified as a waste. This includes textiles which can be resold, and the movement and transport of waste textiles is covered by waste management legislation in the UK (DTI, 2003). The average lifetime of a garment is about three years (Waste online, 2002)

It is estimated that textiles account for approximately 4.6% of the total household waste stream (Project Integra Waste Analysis 1999). It is estimated that a single tonne of textiles waste fills roughly 200 black bin bags' (NI 2000). Data available on the actual arising of textiles in Hampshire is hard to establish due to the variety of ways it is disposed of

The Commercial and Industrial sectors are also a key generator of textiles waste. However, the lack of data on these sectors means the proportions of textiles wastes produced in Hampshire is unclear.

### 3.2 Current Disposal Options

In the household waste stream it is estimated that on average only 13% of textiles are recovered for re-use and recycling in Hampshire. This means that there is plenty of potential for recovering greater tonnages of this type of waste. Almost everything collected will have a useful second life, but it has to be graded and sorted many times. There is a network of clothing banks dealing with household wastes situated throughout the county. Household textile waste can be collected for reuse or recycling by using a number of methods including

- House-to-house collections through designated bags delivered by charities or kerbside collection recycling schemes set up by the Waste Collection Authority.
- Taking unwanted items to charity shops
- Taking unwanted items to bring banks
- Taking unwanted items to Civic Amenity Centres (termed Household Waste Recycling Centres in Hampshire)

Textile recycling is one of the longest running forms of recycling. It is estimated that £400 million worth of textiles a year are not recycled or reclaimed in the UK. This costs nearly £1 million a year to dispose of (Project Integra, 2003). All types of textiles can be either recycled or reused in a variety of different ways. It is estimated that one million tonnes of textiles are discarded each year in the UK despite the fact that as much as 95% is reusable or recyclable. The amount of textiles recycled each year has grown dramatically over the last decade. This has been largely due to the increase in the number of textiles banks and the number of charity shops.

The majority of post-consumer textiles are currently collected by charities. Kerbside collections for textiles currently take place through door to door collections by individual charities as there are currently no local authority led kerbside collection services for textile wastes in Hampshire. Collection of textiles from the household has been confined to charities, community groups and private companies. There are existing networks for the collection and onward recycling and re-use of this waste but existing collection systems are not recovering sufficient quantities (especially in the household waste stream) and therefore expansion and development of these systems is required.

Textile banks have encouraged a steady increase in the recycling of textiles within the county to date. In 2002/03, over 2,800 tonnes of textiles and 120 tonnes of shoes were reused or recycled via the '291 bring banks and 81 shoes banks in Hampshire' (Textiles Survey 2002/3). The textiles collected from the banks are reused or recycled by charities which either sell reusable clothes at local charity shops or send unwearable items to a central sorting facility. Specially trained workers are able to grade and sort the donations into around 140 categories, starting by separating the garments from other items that might also have been deposited in banks. Some charity shops sell unsold textiles to textile recycling merchants or often export them overseas. Textiles, which are not suitable for reuse, can be remanufactured into items such as wiper cloths and furniture filling.

Traditionally, landfilling waste textiles was the main method of disposal until recycling became more common place. In the UK it is estimated that '1 million tonnes of textiles still goes to landfill each year' (Elliott Cohen, 2003). In Hampshire it is estimated that approximately 26,000 tonnes of waste textiles is landfilled annually. Material which is of poor quality and does not fit the specifications for recycling or re-use is disposed of by landfill or an energy recovery facility. It is estimated that up to 95% of the textiles that are landfilled each year could be recycled (Recycling Association 1995).

Textiles can also be disposed of directly into the household residue bin. The 1999 Waste Composition Analysis completed in Hampshire indicated that an average of 4.6% of kerbside collected waste consists of textiles. This is then taken to landfill or to an energy recovery facility. The Waste Composition Survey (1999) states that it is 'evidential that significant amounts of textiles could be recycled which are currently being disposed of in residual bins'. There is little information available on the disposal of commercial and industrial textile waste.

Textiles can also be recycled through reprocessing. For example, worn or damaged textiles may be processed into a number of products including industrial wiping cloths. The textiles are sorted and cut into squares to generate the cloths. These are sold in various grades according to the fabric used. Other suitable materials can be graded for fibre reclamation and filling products. Depending on the end use, the textiles can be separated into type and colour. The material is shredded or pulled apart into small fibres, called shoddy. Flocking rags are made from this process and are sold on as industrial filling materials. These are used in such items as mattresses and

upholstery, sound insulation panels and carpet underlay. Today most of the rag pulling and shoddy processing is carried out overseas e.g. India.

The lack of data on commercial and industrial textile waste means that the preferred disposal options for commercial and industrial wastes are unclear. It is likely that landfill forms a large proportion of the disposal options used for commercial and industrial textile wastes.

There are a number of complex environmental, social and economic issues, which need to be addressed at a local, national and international level when dealing with textiles within the waste stream.

### **3.3 Social Issues**

Consumers react to changes in fashion both in clothing and household interior designs. Seasonal changes in fashion mean that clothes can become outdated very quickly, and this encourages the replacement and disposal of outdated, yet good quality garments. Consequently, manufacturers will increasingly develop high quantities of low durability clothing in response to a 'throw away' society. Economic prosperity also influences this trend, as the production of textiles increases with consumer spending, so does waste production from both the manufacturing and household sectors. 4% - 6% of seasonal and fashion clothing in the UK becomes terminal stock (DTI)

The quoted recovery rate for textiles is relatively high in comparison with some of the other household waste streams, possibly reflecting consumers perception that there is more value in used clothes than, for examples, drinks cans or bottles' (DTI, 2003). Although there is a large network of textile banks across the county, a lack of consumer awareness means that these are still not used to their full potential, and clothes are frequently disposed of in the main household waste stream. This awareness of textiles recycling needs to be built on to incorporate a wider collection from the general public as a whole. It is estimated that 55% of charity shop users say that recycling is one of the reasons why they chose to shop in charity shops as they give 1.9 million households every week the opportunity to reuse and recycle unwanted textiles' (Textiles Reuse and Recycling, 2003).

Project Integra has run a successful textile waste awareness programme over the past few years. The 'Worn it? Recycle it' campaign seeks to highlight the benefits of recycling textiles within the county.

There is a network of clothing banks throughout the county and this campaign aimed to increase awareness of items that can be recycled in these banks. The campaign was supported by the Salvation Army, who hope to introduce more clothing recycling banks in Hampshire.

There are safety implications involved in all stages of the process chain for textiles. Strict health and safety regulations exist when dealing with the

hazardous elements of textile productions, i.e. there are high risks to human health when using chemicals to dye fabrics.

### **3.4 Environmental Issues**

#### **3.4.1 Benefits**

Many environmental benefits are associated with the recycling or re-use of textiles. Textiles recycling and recovery reduces the demand for virgin resources. Evergreen claims that 'If everyone in the UK bought one reclaimed woollen garment each year, it would save an average of 371 million gallons of water (the average UK reservoir holds about 300 million gallons) and 480 tonnes of chemical dyestuffs'. The recycling and re-use of textiles also potentially causes less pollution compared to the production of textiles from virgin resources. For example, recovery means that there is less effluent produced and reduces the demand for dyes, fixing agents and other chemicals.

Recycling and reuse of textiles also reduces the need for landfill space.

A study by ERM of Salvation Army textile recycling operations found that processing and distribution of post consumer clothing consumes 1.7 kWh of extracted energy per kg of second hand clothing recycled. There is, therefore significant benefit to be achieved through recycling as the energy burden of recycling is insignificant in comparison with the savings made through off-setting new production. The clothes recycling study concluded:

- For every kg of new cotton clothing displaced by second hand clothing approximately 65 kWh is saved
- For every kg of new polyester clothing displaced by second hand clothing approximately 90 kWh is saved (Streamlined Life Cycle Assessment of Two Marks & Spencer plc Apparel Products, 2002)

#### **3.4.2 Environmental Hazards**

Textiles present particular problems in landfill as synthetic (man-made fibres) products will not decompose, while woollen garments do decompose and produce methane, which contributes to global warming. Textile waste in landfill in particular can be environmentally damaging. It contributes to the formation of leachate as it decomposes, which has the potential to contaminate both surface and groundwater sources. Another product of decomposition in landfill is methane gas, which is a major greenhouse gas and a significant contributor to global warming. The decomposition of organic fibres and yarn such as wool produces large amounts of ammonia as well as methane. Ammonia is highly toxic in both terrestrial and aquatic environments, and can be toxic in gaseous form. It has the potential to increase nitrogen in drinking water, which can have adverse effect on humans (Cupit 1996). Cellulose-based synthetics decay at a faster rate than chemical-based synthetics. Synthetic chemical fibres can prolong the adverse effects of both leachate and gas production due to the length of time it takes for them to decay.

Textile and leather articles can also contain certain chemicals which have the capacity to release products that are harmful to human health and the environment.

Another environmental impact is created by the extensive use of cotton in the textile industry. The most popular textile fibre in the world is cotton, which accounts for 33% of global textile production (WWF International, 1999). Cotton is seen to be more environmentally friendly than fossil oil based synthetics, a non-renewable product. However, a life cycle assessment by clothing company Patagonia found that cotton causes the greatest environmental damage of all textiles (Gill, 2000). The trouble arises because although cotton is a very desirable textile fibre, it is a difficult crop to grow. Cultivated on just 2.4% of the world's agricultural land, it accounts for 14% of the world's pesticides use and 7.5% of the world's use of artificial fertilisers (Dinham, Pesticides Trust). Cotton is also the world's most water intensive crop (WWF International, 1999).

Hemp Fibre on the other hand can have environmental benefits. A study carried out by the University of Melbourne found that hemp production for textiles, as an alternative to cotton textiles, would increase economic efficiency whilst reducing the ecological footprint of production by up to 50%. Fabrics made from hemp are very comfortable to wear, they "breathe" and so keep the wearer cool in hot weather. They are also soft and yet hardwearing. (Bioregional)

### **3.5 Economic Issues**

Commercially, textile waste generation is influenced by the production of textile goods: the higher the production, the greater the amount of waste. This is in turn a function of consumer demand, which is influenced by the state of the economy.

Complex mixtures of fibres make separation more difficult and more costly, and this has implications for the profitability of textile recycling.

The economic market for recycled textiles is currently buoyant. Despite currency and demand fluctuations in overseas markets, demand for used clothing from the UK has remained generally good over the past few years. The top 10% of textiles can be resold as nearly new garments in charity and second-hand shops. This stream represents the most profitable option for textile recovery, with values as high as £10 000 per tonne for the best articles (DTI, 2003). Garments sold for reuse generate the best income as reprocessing requirements are either zero or minimal and the costs are low despite the need for manual sorting. However, the typical retail price of second-hand clothes is only a small percentage of that of new clothes in the UK. Recycling and reuse of textiles also help to aid the balance of payments for textile goods as we import fewer materials for our needs.

New markets for recycled or re-used products should also be explored. For example, the market for textiles needs to be developed so it does not rely on sale of second-hand clothing overseas and the commercial and industrial textiles sectors may also offer opportunities for further recovery but it is not currently known to what extent. It is important not to overlook that the market is very cyclical in nature and so this will affect the costs associated with collection and the amounts of materials collected. For example, garments suitable for reuse are graded, such as separating light summer clothes from heavy winter clothes. Seasonal changes in fashion mean that clothes can become outdated very quickly, and this encourages the replacement and disposal of outdated, yet good quality garments. Consequently, manufacturers will increasingly develop high quantities of low durability clothing in response to a 'throw away society'. Economic prosperity also influences this trend, as the production of textiles increases with consumer spending, so does waste production from both the manufacturing and household sectors. Since seasonal clothes tend to be donated at the end of that season, items for reuse are typically stored for a period of time before they can be sold most profitably. The costs of storage facilities therefore must be considered. The markets for waste and sorted textiles has seen a down-turn in prices in the past due to the strength of the sterling pound, import duties, competition from retailers, who sell new items at the same or lower prices, and the growth of markets in Africa for clothes manufactured in the Far East. For example, the continued high value of sterling makes it more difficult for UK reuse clothing to compete with its American equivalent in the export market. In addition, a more serious source of competition is the import of cheap clothing from abroad. The growth in the grey goods market (i.e. counterfeit designer wear at much reduced prices) both undermines the charity business and presents poorer quality clothing for resale.

There are a number of associated costs with textiles and recycling. For example, the UK textile industry estimates an annual spending of £182 million on water, £193 million on chemicals, and £81 million on energy used for the production and manufacturing of textiles. Also, the average textile bank price paid to a local authority by a collector or charity for material collected from bring banks is £20 – 30 per tonne. The price for well-presented material delivered from charities to factories of a larger textile collecting business is between £130 and £165 per tonne (including transport costs). Labour costs are also an issue. Although several charities and companies operate textile recycling programmes, the labour-intensive nature of collection and sorting are barriers to new market entrants (DTI, 2003). Larger activities result in significant savings due to economies of scale. Transportation costs could potentially be an expense. For example, shipping is often used to transport textiles abroad. This is regulated under the EC Council Regulation (EEC/259/93) on Supervision and Control of Transfrontier Shipments of Waste.

There is an incentive to reduce the amount of textiles going to landfill as this has financial implications including the landfill tax. Hampshire County Council through its waste management group gives third parties, such as charities, financial awards through recycling credits for quantities of textiles collected

recycled. At the moment textiles reused in Hampshire are not awarded credits, although by avoiding the disposal of textiles via landfill, it can help reduce costs. More reuse and recycling of textiles would reduce the demand for raw materials and a reduction in transportation costs. Reclamation of textiles could also help to create new jobs.

Although the technology exists to do some of this grading automatically, UK facilities favour manual selection.

### Codes of Practice

A range of industry codes of practice and best practice literature are available to ensure that all processes and systems are managed effectively to minimise waste and prevent pollution.

#### **4.1 EU eco-labelling system (Commission Decision 1999/178/EC):**

This label sets the main environmental performance indicators of textile printing and dyeing by imposing:

- demands on heavy metal impurities
- stability and process demands when Cu, Ni and Cr metal based complex dyes are used
- ban on a azo-dyes
- ban on a shortlist of carcinogenic, mutagenic and toxic to reproduction dyestuffs
- stability (colour fastness) demands on potential sensitising dyes (skin allergy reactions)
- use of VOC below 5% in the printing paste
- limits of the amount of free formaldehyde in the final fabrics
- bans a number of fabric softener and complexing agents, such as EDTA (ethylene diamine tetra acetate) (Sondergard, 2002)

#### **4.2 OEKO-TEX 100:**

The OEKO-TEX label is an internationally registered mark. Textile and clothing producers are working successfully to design products with no harmful substances present in any significant amounts and to achieve this, a significant technological effort is required by the industry. Manufacturers can work towards this goal by adopting recognised standards. Textiles with this mark:

- do not contain allergenic dye-stuffs and dye stuffs that form carcinogenic arylamines of the MAK-groups III A1 and III A2.
- have been tested for pesticides and chlorinated phenols.
- have been tested for the release of heavy metals under artificial perspiration conditions.
- are free from formaldehyde or containing trace amounts significantly lower than the required legal limits.
- have a skin friendly pH
- are free from chloro-organic carriers
- are free from biologically active finishes

A 12 month licence is granted after successfully meeting the criteria and revalidated through an on-going independent auditing and continuous improvement testing process.

#### **4.3 Dye Standards**

The EU restricts the marketing and use of certain dangerous substances. The concerned Directive (2002/61/EC) of July 19, 2002 refers specifically to the use of certain azodyes in the manufacturing of textile and leather articles.

<b>Current Key Players</b>
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**5.1 The Textiles Recycling Association** is a national organisation whose role is to act as a voice to represent the interests of its members at a local, national and international level with the aim of creating a favourable climate for textiles recycling. Textile Recyclers Association seeks to promote textile recycling. It is a membership organisation.

**5.2 Project Integra** was set up in 1993, helping to introduce an integrated waste management strategy for Hampshire. The green waste recycling infrastructure in Hampshire has been set up through Project Integra and currently provides high recycling rates of household generated green waste.

**5.3 The Waste and Resources Action Programme (WRAP)** is a not-for-profit company supported by Defra, the DTI, and the devolved administrations of Scotland, Wales and Northern Ireland. It is working to promote sustainable waste management by creating stable and efficient markets for recycled materials and products.

**5.4 Charities in Hampshire who collect waste textiles include SCOPE, St Michaels Hospice, British Heart Foundation, Oxfam, TR Aid and The Salvation Army.**

**5.5 Hopkins Recycling** runs many of the textile recycling bins situated throughout the county.

#### **5.6 European Shoe Recycling**

**5.7 Defra** is the Government department with prime responsibility for waste and resource management, as well as other forms of environmental protection and the promotion of Sustainable development.

**5.8 DTI** is the Government department responsible for encouraging growth and development of trade and industry in the UK. It aims to promote constructive co-operation between the regulated, the regulators and the UK's environmental technology suppliers who serve them.

**5.9** The **Environment Agency** regulates waste management through a system of licences. The Agency registers and monitors the transportation of waste and advice on waste management methods.

**5.10** The **Association of Charity Shops** is dedicated to supporting charities which run shops as part of their fundraising activities. By pooling expertise and joining forces promote to common interests, we help members to operate their shops as effectively as possible. One of the main objectives of the organisation is to improve contacts with local councils, businesses and suppliers. They have agreed a joint Memorandum of Understanding with the Local Government Association and have been working with other organisations to promote good practice initiatives on recycling and waste disposal for charity shops and local authorities.

**5.11** **Community Recycling Network** is the national umbrella organisation for community-based, not-for-profit and co-operative waste management groups which work in reduction, re-use and recycling

**5.12** The **Textiles and Clothing Strategy Group (TCSG)** is an industry led group, including manufacturers, retailers, trade associations, trade unions, academia and government. It was set up to identify and examine the major issues affecting the future of the UK clothing and textile industry and has produced the 'National Strategy for the UK Textile and Clothing Industry'.

### Current Examples of Best Practice

**6.1** A number of Waste Collection Authorities have set up a kerbside collection system for textiles. Some authorities use a kerbside sorting collection for their textiles and other mixed dry-recyclables.

**6.2** **Kettering Textiles Ltd:** In 1991, Northamptonshire-based textile merchant Kettering Textiles Ltd formed a partnership with the Salvation Army to produce their own textile recycling facility. This facility is very similar to a Materials Recovery Facility in that it contains a weigh bridge, various conveyor belts and sorting stations. The company employs 250 people of which 80 are required to sort 140 grades of material. The project has a turnover of £9 million and collects approximately 22,000 tonnes of material a year. Between 10-20% of clothing could be sold in the Salvation Army's 42 shops and the remainder is exported to Africa the Indian sub-continent, the Eastern Bloc and Russia. The Salvation Army originally established 1,000 collection banks in the first year of operation but this figure has now risen to over 2,300. In 1998 the partnership decided to design its own materials recycling facility to cope with the increased volume of textile materials donated.

**6.3** **IDEA Ambiente**, an Italian social economy network, has attempted to tackle the issue of ethical exports of recycled textiles. They have set up a joint venture with the 7 saving and credit rural banks in Senegal to help provide a

transparent system in the management and marketing of second hand clothing whereby all profits are reinvested into the system, with the general objective of sustaining local businesses and improving quality of life.

## 6.4 Changes to the Manufacturing Process:

### 6.4.1 Reducing Dye Waste

-Chemical substitution: changes that textile industries can make to reduce BOD and improve effluent quality:

• Application	• Current Material	• Substitute Material
• Sizing	• Starch	• PVA/Acrylates
• Acid desizing	• Enzymatic	• Mineral acids
• Washing	• Soaps (140% BOD)	• Synthetic detergents (0 - 2.2% BOD)
• Neutralising scoured goods	• Soda ash	• Sodium acetate
• pH adjustment in disperse dyeing and pigment printing	• Acetic acid	• Ammonium sulphate
• Textile printing	• Gum- thickening	• Emulsion thickening
• Oxidation of vat dyestuffs	• Acetic acid	• Sodium bicarbonate with peroxide or perborate
• Finishing	• Temporary starch-based finishes	• Durable resin finishes
• Dyeing of blended varieties in pale shades	• Two-stage dyeing using two different classes	• Single class dyestuffs like Indigosol, pigments
• Polyester dyeing	• Other carriers	• Monochlorobenzene
• Dye bath acid	• Acetic acid (0.64 kg BOD/kg)	• Formic acid (0.12 kg BOD/kg)
•	• Carding oils and anti-static lubricants	• Non-ionic emulsifiers

6.4.2 **Sodahl Design (SD)** and **Danish Colour Design (DCD)** produces household textiles. DCD is a subcontractor to Novotex which produces clothes and linen within a green concept ("Green Cotton"™). Novotex and SD are ISO 14001 and EMAS certified, DCD is ISO 14000 certified and Novotex and DCD have achieved the standard for the EU eco-label and the Nordic Swan on part of their products.

DCD reduced water consumption by introducing re-circulation schemes (and developing re-circulation technologies). Both at DCD and SD water saving was integrated in plant operation, and substantial reductions in consumption of water (and wastewater discharge) were achieved. SD raised eco-efficiency on water by a factor of four. The drawback of this 'water saving trajectory' was the amount of chemical discharged was not reduced accordingly.

Novotex passed demands on DCD regarding dyes to meet the "Green Concept"™ (Sondergard, 2002)

#### **6.4.3 Reducing Process Waste:**

Interface Fabrics Ltd in October 1998 set an objective to reduce solid process waste by 25%. To help meet this objective, selvage savers costing £1 800 each were fitted to the weaving machines in a phased programme. With the selvage saver no fabric has to be cut off and wasted. The average amount of textile waste has already fallen by 729 kg/week from 2 766 kg/week in 1998 to 2 037 kg/week in 1999. For 45 weeks' production, this represents a saving of 32 805 kg/year of textile waste. This initiative is ongoing. The Company is also evaluating other waste saving opportunities identified during a survey of where bulk process waste is generated. Textile waste is sent to a local company to be processed into low-grade yarn and fabrics. Other solid waste is segregated into three categories to increase the potential for recycling (Envirowise, 2000).

#### **6.4.4 Ayrshire Textiles Waste Minimisation Club:**

One of the first sector-specific regional clubs in the UK and is dedicated to meeting the needs of the textiles industry. The Club is organised by Enterprise Ayrshire with technical assistance from the Environmental Technology Best Practice Programme, and currently has 11 members that specialise in the manufacture and finishing of a wide range of textiles. Through participation in specially-designed workshops and training, Club members learn how to reduce waste systematically, increase efficiency and save money. Within the textiles industry there are considerable opportunities for saving money by reducing waste. The average cost of waste in the industry is around 3% of the turnover. Most companies could reduce their waste costs by at least 25% with savings going straight to bottom line. Despite it being a difficult period for the textiles industry, Club members saved, on average, 1% of annual turnover through implementation of mainly no and low-cost measures. The benefits of the Club include:

- Total annual savings of £538 200, with further potential savings identified
- Almost 50% of projects with immediate payback
- Reductions in solid waste and effluent production, plus energy, water and raw materials use
- A framework to support longer-term sector-specific activity in Ayrshire

#### **6.4.5 Ulster Carpet Mills:**

Latex is used to coat the back of carpets to retain the turf. Instead of dumping the left over latex at the end of each day, it was reused. The latex recycling system has eliminated the disposal to waste of final latex mix and reduced

most of the wash water disposal. Recycling has generated the following benefits:

- reduced the total load of waste solids and wastewater for disposal by an estimated 45%,
- Cost savings in the first year of over £13 000
- Latex use reduced by 5%

(Envirowise, 1996)

#### **6.4.6 Reduction of the formaldehyde emissions released during the application of a flame retardant finish to fabrics.**

Applying a flame retardant finish to cotton fabrics can release the volatile organic compounds, formaldehyde and methanol. Alternative formulations to find an optimum recipe that gives the least emissions of these compounds for a satisfactory fabric finish were identified which:

- Reduce formaldehyde emissions by up to 75%
- Reduce phosphorus levels in effluent
- Reduce costs by improving application to fabric

#### **6.4.7 Wastechange.net**

An internet system to exchange commercial waste for free. It enables European trade and industry to locate cost effective recycling, waste management and waste exchange solutions for all categories of commercial waste, post consumer waste and by-products previously destined for landfill. There are links for available textiles and leather and wanted textiles and leather.

### **How is this likely to change by 2020**

#### **7.1 Future Data Required**

- Arisings of textiles waste in Hampshire
- Disposal of commercial and industrial textile waste
- Main recyclers in Hampshire
- Main disposers of textiles waste in Hampshire – sources
- More statistics to help make decisions/estimates to decide on best environmental solution for textiles. Identify what we are achieving and what we could potentially achieve then identify where new facilities/partnerships can be made.
- Determine how much new clothing is sold
- Develop a mass balance on textiles
- technology for reuse of secondary textiles, innovation for new ideas for products
- Commercial and Industrial generators of textiles waste

## **7.2 Future legislation**

Under the Landfill Directive (1991/31/EC), a number of future targets have been set to reduce the amount of biodegradable waste going to landfill by set time periods. This will have an impact of the disposal of textiles as there are elements of textiles waste, estimated at 50%, which are organic (e.g. cotton and wool).

Legislation on door-to-door collection should be introduced classifying whether it is a waste or a donation.

### **Producer Responsibility**

The European textile recycling industry continues to face a bleak outlook for many of the reasons outlined in the preceding text. The costs of collection are escalating whilst incomes are falling. There has been a call by the BIR for "producer responsibility" levies on the clothing manufacturers. The concept of "producer responsibility" seems to be becoming a useful "instrument" in the EU's armoury. It is conceivable, therefore, to conclude that with pressure from the Recycling Industry this could become a reality in the not too distant future.

## **7.3 Future Options for Resource Management**

The MRS should look into the viability of Waste Collection Authorities setting up kerbside collection schemes in partnership with other organisations such as charities. There are existing networks for the collection and onward recycling and re-use of this waste but existing collection systems are not recovering sufficient quantities (especially in the household waste stream) and therefore expansion and development of these systems is required. This could be through co-ordinated kerbside collection of textiles, in partnership with others. Eastleigh Borough Council are said to be keen in setting up a trial collection. However, there are a number of concerns over how much impact such collection schemes may have on take up of such schemes and on the surrounding charity collections which usually take place through informal house to house collections.

Ideally, the consumption of textiles should decrease to help minimise the amount of textile waste produced. Alternatively, all textile waste should be recovered for reuse and recycling to decrease the amount disposed at landfill. More interaction between research and development, academia and trade and industry is needed.

Local Authorities should also encourage the increased recovery of textiles from commercial and industrial sectors.

## 7.4 Social Issues



Worn it, recycle  
it scheme,  
Project Interga

A further communication strategy for the people at Hampshire regarding textiles could be developed to raise awareness of textile waste issues. This could be used to improve messages of textiles reuse and highlight public messages/awareness of textiles reuse/recycling. Education is a key tool in raising public awareness (particularly at schools) on textiles and could help to emphasise repair and re-use of textiles. In addition, there needs to be a better understanding of what is classed as 'reusable' and what is 'recyclable textiles' and awareness and participation in textile recovery needs to be increased amongst the general public.

## 7.5 Environmental Issues

The re-use of items should also be included in BVPI's as re-use is a valuable way to divert items that would otherwise end up being disposed of through landfills. Household collection weights could be given to Councils to help increase recycling targets for textiles. This also has links to the county's PSA target agreement to reduce the amount of waste going to landfill. Future targets for the reduction in biodegradable waste going to landfill should help to reduce the production of ammonia and methane caused by the breakdown of organic waste.

## 7.6 Economic Issues



Collection systems for the collection of recyclable textiles need to be at a low cost. There should be an effort to introduce more bring bank facilities in Hampshire for quality material and introduce kerbside collections county wide. The sites should be accessible, well publicised and attractive to the community to encourage use. Recycling facilities across the county should incorporate a sorting facility for textile waste if applicable for charities to collect from. This would not only be more economically viable but would also help to reduce transportation costs.

The costs of advertising recycling facilities must be considered. When advertising for kerbside collection, it should be suggested that charity shops are first disposal route; have better publicity for collection services to households by charities.

Textiles are not one of the products currently considered by WRAP. However, a similar programme of market development for novel re-use and recycling is

required to build capacity for re-processing in the UK (especially for clothing and other textiles that are of not sufficient quality for re-sale).

To aid development of markets it would be useful to encourage the joint working of users and producers within local markets together to look at ways in which recycled products which are currently too expensive to put back into manufacturing can be incorporated into the recycled waste streams. For example this could be through co-ordinated kerbside collection of textiles, in partnership. In addition awareness and participation in textile recovery needs to be increased amongst the public. Charities will collect recyclable textiles as long as the ratio of reusable to recyclable textiles stays the same or increases. There is also a need to find the balance between organisations that need to reuse textiles and make money and Councils that need to reduce waste and related costs.

It could be beneficial to give retailers incentives by credits and increased recognition to aide in the development of increased recycling targets for textiles.

Innovation in design of clothing e.g. have a longer life, have less need of cleaning, drying and pressing, are biodegradable. This will not only reduce costs, it will also be less economically damaging and sustainable. It would also be beneficial to the markets if the manufacturers are lobbied to try to redress the difficulties currently faced in purchasing 'environmentally – friendly' or 'fair trade' clothing / recycled products.

Reducing waste textiles at the source should also be tackled as a priority in any waste management strategy as it ultimately costs more to deal with the waste downstream. The adoption of a more efficient product design, the implementation of more efficient practices and procedures and the introduction of more efficient machinery will all lead to benefits. Getting the most out of existing products can also reduce waste. Companies need to maximise the life of clothing and uniforms by considering running repairs instead of buying replacement garments.

## **Scenarios to Achieve the MRS Vision**

### **10.1 BUSINESS AS USUAL SCENARIO**

- Hampshire authorities will continue to collect textiles through a comprehensive bring bank system.
- The authorities will look into kerbside collection for textiles
- The authorities will continue to work closely with textile reuse/recycling organisations.

There will be some publicity and awareness raising

- As there is not sufficient information on retailers within Hampshire in terms of garments that haven't been sold or got damaged it is difficult to discuss it.

### **With the Business as Usual Scenario**

- the amount of textiles going to landfill will proportionally go up as more fashionable low price textiles are being purchased.
- there will be a fall in the textile reuse market due to increase in low quality textiles.
- the Landfill Directive will have an impact on the way we are dealing with textiles
- Legislative changes will have an impact on collections.

### **10.2 INTERIM SCENARIO**

- Some Hampshire Authorities will introduce kerbside collection for textiles.
- Some R&D will be done
- Some secondary use for textiles will be in place.
- More sustained publicity and awareness raising

### **With the Interim Scenario:**

- The amount of textiles recovered will increase due to better awareness of textiles
- More textiles can be recycled as the market for secondary use has been improved

### **10.3 STRETCHED SCENARIO**

- All Hampshire authorities will have kerbside collection for textiles plus a comprehensive bring bank systems for textiles.
- A sustained and well developed publicity and awareness raising campaign has been developed
- Thinking has to come at the design stage for secondary use
- Lobby nationally for:
  - an integrated textile strategy
  - more funding for R&D
- Retailers and manufacturers will voluntarily adopt the Eco label
- Retailers will have schemes for recycling and reuse of unused garments in place
- The environmental impact of garments such as dye, etc. will be reduced or substituted by more environmentally friendly products.

### **With the stretched scenario**

- The maximum possible tonnage will be recovered from householders and retailers
- There will be a high awareness amongst the public and key players
- A national and EU strategy will be in place
- Comprehensive research has been done into secondary use and industry will have been set up
- The chemicals and toxins in textiles will have been reduced to a minimum

## Further Information

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Assistance in developing this paper and the industry expert on the day will be:

- Garth Ward of Salvation Army Trading Co. Ltd.

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