Valuing our clothes

The true cost of how we design, use and dispose of clothing in the UK

Valuing our clothes is a summary of the key findings of a major technical report published by WRAP. It presents estimates of the carbon, water and waste footprints of clothing throughout its life-cycle for one year for the UK as a whole, plus evidence from a major new survey of consumer behaviour involving 7,950 UK adults aged 16+. It seeks to highlight opportunities across the clothing value chain to reduce the resource impacts of clothing supply, use and disposal.

1. Key findings

Changes to the way the UK supplies, uses and disposes of clothing could reduce the carbon, water and waste footprints of clothing consumption by 10-20% each. This could cut some £3 billion per year from the cost of resources used in making and cleaning clothes.

New research from WRAP has found that:

- the annual footprints of a household's new and existing clothing are equivalent to the weight of over 100 pairs of jeans, the water needed to fill over 1,000 bathtubs, and the carbon emissions from driving an average modern car for 6,000 miles;

- the average UK household owns around £4,000 worth of clothes – but around 30% of clothing in the average wardrobe has not been worn for at least a year, most commonly because it no longer fits;

- extending the average life of clothes by just three months of active use per item would lead to a 5-10% reduction in each of the carbon, water and waste footprints;

- two-thirds of UK consumers buy or receive pre-owned (or second-hand) clothes, and there is a willingness to wear more, especially if a better range were available; and

- an estimated £140 million worth (350,000 tonnes) of used clothing goes to landfill in the UK every year.

What this means for the clothing sector

WRAP research identified five key areas which offer opportunities for businesses and consumers to save money and resources – as well as delivering other benefits. As Figure 1 shows, these opportunities cover the entire clothing life-cycle.

Figure 1. The core opportunities to save money and resources across the clothing life-cycle

A. Reduce the resource impacts of clothing sold to the consumer

E. Keep clothes out of landfill

Materials & garment supply

Fibre, yarn, fabric and garment production, distribution and retail

In-use

Use and re-use, laundry, storage

End-of-life

Re-use, recycling, incineration, landfill

B. Extend the useful life of clothing

D. Reduce the environmental impacts of laundry

C. Increase supply and demand for pre-owned clothing
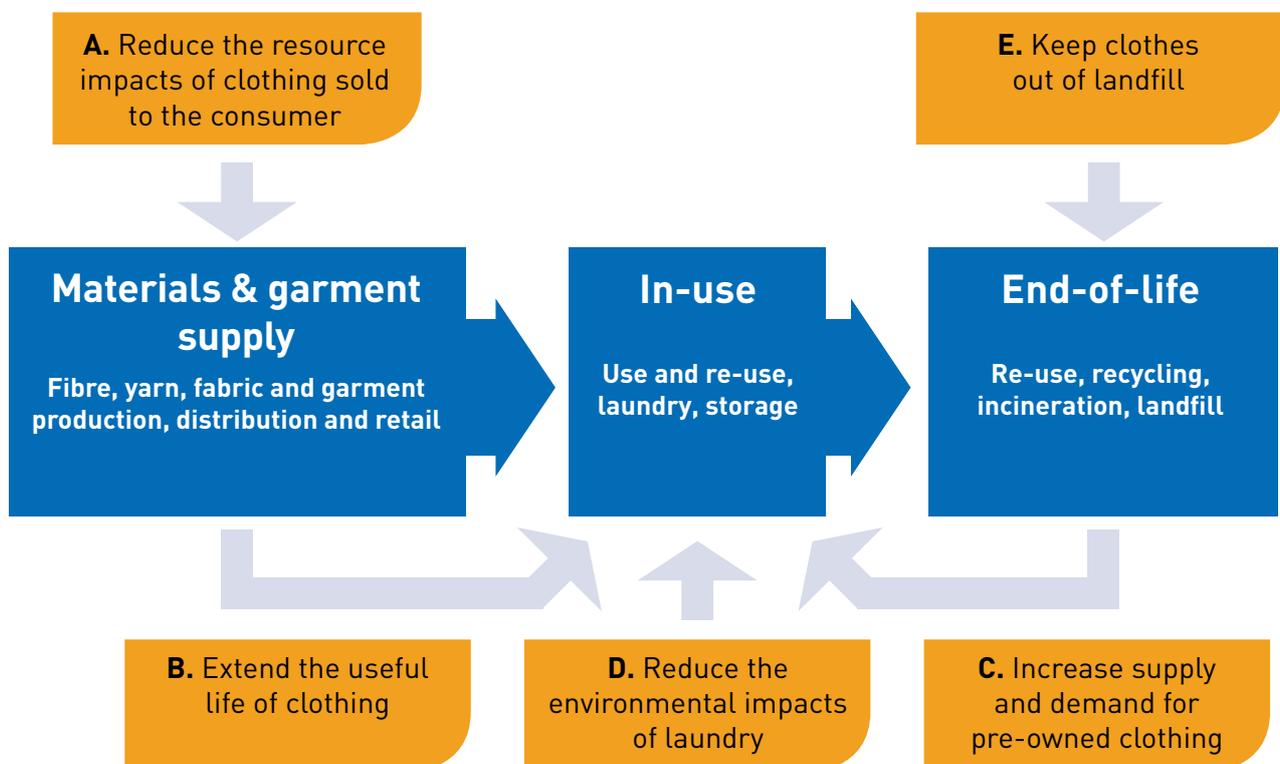
Extending the useful life of clothing

The most significant opportunity for savings is to increase the active life of clothing. Clothing accounts for around 5% of the UK's total annual retail expenditure, with consumers spending £44 billion a year on buying clothes – or around £1,700 per household. If clothes stayed in active use for nine months longer (extending the average garment life to around three years), this could save £5 billion a year from the costs of resources used in clothing supply, laundry and disposal. Given that over 5% of the UK's total annual carbon and water footprints result from clothing consumption, savings of this scale would be hugely significant not only in financial and commercial terms, but also environmentally.

The core opportunities to save money and resources across the clothing lifecycle

A. Reducing the resource impacts of the clothing sold to consumers

The processes from raw material to garment supply contribute around one-third of the waste footprint, three-quarters of the carbon impact and most of the water footprint of clothing. While opportunities to reduce these impacts may be restricted as UK retailers have limited influence over global suppliers, there is some potential to encourage suppliers to adopt more sustainable and efficient processes. This has a range of advantages, but most importantly it can help the retailer gain a reputation for being environmentally aware. Retailers may also be able to reduce resource impacts by specifying improved and alternative fibres with lower impacts.

Capitalising on consumer interest – WRAP research found that consumers think there is too little environmental information about the clothes they buy. Providing that information and demonstrating good practice should strengthen brand values.

E. Keeping clothes out of landfill

Just under one-third of clothing goes to landfill, losing all value. If all this material was given to charities, local authorities or other organisations for re-use or recycling, it would generate over £140 million of additional income at current prices. Nearly half of consumers put at least some clothing in the bin. Making clothing collections easier for householders to use and looking for opportunities to keep clothes out of the bin are key actions here.

Explaining the value of used clothes – WRAP research showed that respondents would be less likely to throw clothes out if they thought the material was of value. This suggests there is an opportunity for the sector to provide clear information to encourage householders to use options for donation and collection such as charity and local authority collection services.

Materials & garment supply
Fibre, yarn, fabric and garment production, distribution and retail

In-use
Use and re-use, laundry, storage

End-of-life
Re-use, recycling, incineration, landfill

B. Extending the useful life of clothes

Extending the life of clothing by an extra nine months of active use would reduce carbon, waste and water footprints by around 20-30% each and cut resource costs by 20% (£5 billion). This is a key opportunity to make a difference, and encompasses changes in design (e.g. to increase durability), getting existing clothes out of the wardrobe more often, repair and greater re-use of clothing by UK consumers.

Around 30% of clothes in the household wardrobe typically have been unused for at least a year – worth over £1,000 per household or £30 billion across the UK. Most often, clothes are unused because they no longer fit. One potential opportunity for retailers and brands could be to sell clothes that offer a more versatile fit. Also, the industry as a whole could respond to consumer interest by increasing access to alteration services and providing more information on how to repair clothes.

Disposable fashion versus long-term value – when buying clothes, consumers rank value for money as their top purchase criterion, and one-third of them would value an indicator of durability. Only 21% of consumers say they consider the latest trends in fashion as influential when buying clothes.

D. Reducing the environmental impacts of laundry

Laundry accounts for around one-quarter of the carbon footprint of clothing. Washing clothes less often, washing at a lower temperature, using larger loads and tumble drying less in summertime could cut the footprint by 7%. This would also save the average household around £10 a year – and in some cases, mean clothes look good (less washed out) for longer.

The impact of washing damage – one in ten people have not worn an item because of washing issues: can't get stains out, misshapen during washing, colours have run, faded or the item has shrunk.

C. Increasing supply and demand for pre-owned clothing

At present, around 50% of clothes are re-used, and over two-thirds of these go overseas. Two-thirds of consumers in the UK buy or receive pre-owned clothes, indicating significant willingness to do so. So, given the large reservoir of unused quality clothing in wardrobes, there may be an opportunity to increase collections and resale.

The potential of a buy-back scheme – WRAP research found that two-thirds of consumers would consider using a retailer scheme to buy back used clothing.

Businesses and other organisations across the clothing sector can gain from working to reduce resource use and waste. For example, retailers, brands, suppliers and manufacturers can benefit from:

- reducing the environmental impacts of clothing and demonstrating corporate responsibility – so strengthening their brand reputation;

- reducing waste in the supply chain as part of an existing programme of supplier engagement (e.g. on worker welfare), which can help drive small but important savings in production costs; and

- protecting against the risks of volatile commodity prices and instability in the supply chain by making more efficient use of resources.

Resource pressures

Resource use is a growing issue following a decade-long price rise in many major commodities. Occasional price shocks, such as the short-term doubling in cotton prices in February 2011, are symptoms of what is happening. As the global population increases, so will demand not only for clothing but also to get better value from the finite resources available (e.g. oil and land for crops). For example, competition for water will increase as it is needed for cultivating food and energy crops: more than half of the water footprint of clothing bought in the UK is in countries and watersheds where there is already water stress and scarcity. So, reviewing production processes today will help prepare for these additional pressures in the future.

In addition, WRAP research indicates that there are a number of ways to open up new or additional revenue streams. These include:

- developing the market for pre-owned clothing;

- helping consumers get greater use from their wardrobe, for example, by increasing access to cost-competitive alteration and repair services; and

- increasing the proportion of end-of-life garments which are collected for re-use and recycling. Selling reusable textiles to merchants increases employment, provides a potential source of revenue for charities, local authorities, retailers and other collectors, and reduces the cost of waste disposal.

OPPORTUNITIES FOR CONSUMERS

WRAP research indicates that consumers could gain significant cost savings by changing the way they use and dispose of their clothes. Each year, the average UK household spends:

- £1,700 on purchasing clothing; and

- £130 on laundry – paying for electricity, water charges and detergent.

So while the average costs of clothing exceed £1,800 per household per year, there is a further often unnoticed cost – the contents of the average household wardrobe are worth £4,000 or more. That's a significant investment, compared to average household expenditure of £24,000 a year. But according to research, 30% of clothing in the wardrobe typically has been unused for at least a year, most commonly because it no longer fits. To get more value out of their clothes, consumers could:

- use existing clothing for longer, passing unwanted clothes on to family and friends, or exchanging or sharing them;

- take advantage of the resale value of unwanted clothes by selling them online or at local nearly new sales;

- satisfy the desire for wearing something different, and at lower cost, by buying more pre-owned clothes; and

- donate unwanted clothing, instead of binning it, using collection services provided by charities, local authorities, retailers and other organisations.

These benefits are all in addition to opportunities to cut the costs of laundry. Simply changing laundry practices could save the average household £10 a year on energy and detergent bills.

The importance of information

A common thread throughout the clothing life-cycle is the opportunity to improve consumer information, to help them make more informed choices about valuing the clothes they buy and wear and the clothes they no longer want. There is evidence of consumer interest in greater use of a range of clothing-related services – from tailoring and repairs, to hire, to retailer buy-back schemes.

2. Measuring the carbon, water and waste impacts of UK clothing

To understand the opportunities for reducing resource use and waste in the clothing industry, it's important first to understand how resources are used across the three major life-cycle stages of a garment: materials and garment supply, in-use and end-of-life.

The carbon emissions generated by the clothing of the average household is equivalent to driving an average modern car 6,000 miles

Each stage of the clothing life-cycle has a significant impact (see Figure 2): in fact, on average, the annual carbon footprint of a household's new and existing clothing is 1.5 tonnes of CO_2e (carbon dioxide equivalent, an indicator of global warming potential). Put another way, the total amount of CO_2e emissions a year generated by the clothing of the average household – calculated as the amount of emissions resulting from processes over the whole life of clothing, from fibre production to final disposal of a worn-out garment – is equivalent to the carbon emissions from driving an average modern car 6,000 miles.

Figure 2. The major stages of the clothing life-cycle

Materials & garment supply	In-use	End-of-life
Fibre, yarn, fabric and garment production, distribution and retail	Use and re-use, laundry, storage	Re-use, recycling, incineration, landfill
Over 90% of the water footprint of UK clothing is overseas, often in countries which have water stress or scarcity	The CO_2e emissions from energy use in washing and drying clothes are equivalent to around 10% of the total CO_2e emissions from cars across the UK	Over 30% of clothing goes to landfill at end-of-life

Data limitations

This report seeks to identify overall patterns of environmental impact, based on estimates of the quantities and impacts of clothing at each stage of the life-cycle. Due to the complexity of the supply chain, consumer use and disposal routes, and limited availability of data specific to the UK, values are approximate. The full technical report 'Valuing our clothes: the evidence base' identifies the major uncertainties and provides sensitivity analysis for variables such as fibre choice.

Table 1 shows the estimates of 'global' carbon, water and waste footprints of the clothing purchased, used and disposed of in the UK each year. The global footprint refers to the total impact worldwide from UK clothing – reflecting the fact that much clothing production takes place overseas.

Overall, clothing contributes around:

- 5% of the global carbon footprint of UK goods and services; and
- 6-8% of the global water footprint of UK products and household use.

Table 1. Carbon, water and waste footprints of clothing in the UK each year

	Global footprint of UK consumption of clothing	Global footprint per household	Household footprint equivalent to
Carbon	38 million tonnes CO_2e	1.5 tonnes of CO_2e emissions each year	Driving a car 6,000 miles
Water	6,300 million m^3 of water	More than 200,000 litres each year	Filling over 1,000 bathtubs to capacity
Waste	1.8 million tonnes of material	70 kg each year	Weight of over 100 pairs of jeans

Over 90% of the water footprint of clothing bought in the UK is overseas, often in countries and regions where there is water stress and scarcity. As the global population grows, so will competition for water to support agriculture and day-to-day usage. Over the last decade, consumers have bought more and cheaper garments as clothing prices have fallen. Our growing consumption means we are increasing our carbon emissions, at a time when the UK is committed to reducing its contribution to global climate change.

On average, the global water footprint of a UK household's clothing exceeds 200,000 litres a year – enough to fill over 1,000 bathtubs to capacity.

Which parts of the clothing life-cycle have the most impact?

All three major stages in the clothing life-cycle have big impacts. Much of the carbon footprint derives from fibre, yarn, fabric and garment production, and the water footprint is dominated by production of natural fibres such as cotton. While end-of-life clothing unsurprisingly accounts for the majority of waste, over a third of the total waste footprint comes during the supply stage.

Distribution and retail operations within the production stage contribute least to the overall impacts. Figure 3 shows the impacts of specific aspects of the life-cycle in more detail.

Figure 3. Estimated contribution (%) of each stage of the garment life-cycle to the carbon, water and waste footprints

Materials & garment supply			In-use	End-of-life
Fibre, yarn, fabric and garment production, distribution and retail			**Use and re-use, laundry, storage**	**Re-use, recycling, incineration, landfill**
Most of the water footprint, three-quarters of the carbon and a third of waste			**One-quarter of the carbon footprint**	**Two-thirds of the waste footprint**
Fibre production	Yarn, fabric and garment production	Distribution and retail	In-use (clothes cleaning)	End-of-life
15	60	6	26	-7*
87	13	~0	<1	~0
3	32	<1	<1	64

■ Carbon ■ Water ■ Waste

* Re-use and recycling of clothes at end-of-life reduce the carbon footprint by reducing the need for new materials: hence the negative figure.

How much raw material does the clothing sector consume and how much ends up as waste?

An estimated 1.14 million tonnes of clothes are supplied onto the UK market each year (see Figure 5).

■ To produce these clothes, some 1.76 million tonnes of raw materials are used. Around one-third of this figure becomes waste in the supply chain – a significant proportion of which is unavoidable.

■ An estimated 10,000 tonnes of waste is generated at the in-use stage. This occurs when clothes are damaged while being cleaned – rather than becoming worn out – and then go to recycling, incineration or landfill.

■ An estimated 1.13 million tonnes of end-of-life clothing are no longer wanted by UK consumers and are either re-used (540,000 tonnes, around 70% of which goes overseas), recycled (160,000 tonnes), incinerated (80,000 tonnes) or go to landfill (350,000 tonnes) (see Figure 4).

Figure 4. Destinations of end-of-life clothing

Legend:
- UK re-use
- Overseas re-use
- Recycling
- Incineration
- Landfill

Values shown: 14%, 31%, 34%, 14%, 7%
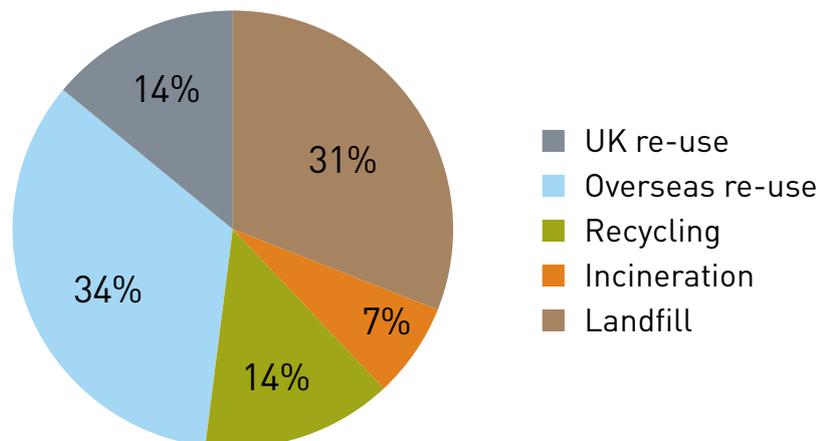
Around 350,000 tonnes of clothes go to landfill at the end of their usable life – despite the materials having commercial value, either as re-used garments, or when recycled into wiping cloths, felts and other non-clothing uses. These values are estimates based on WRAP's previous research on clothing re-use (WRAP, 2011).

Calculating the water and waste footprints

The water footprint of clothes cleaning measures the net 'consumption' of water lost to the system (e.g. water evaporated during drying), and excludes water returned via the drain to the water catchment area. However, the actual volume of water required for washing is considerably higher, equivalent to around 10% of the global footprint: this has particular significance for parts of the UK when facing drought. The waste footprint has been measured from the point of delivery of the raw commodity to the fibre producer. It excludes co-products and wastes associated with agricultural, oil and chemical production.

Figure 5. Estimated material flows and waste in the clothing life-cycle each year

Material input
1.76 Mt

New clothing
1.14 Mt

Supply chain waste
0.62 Mt

Clothing already owned from previous year

Clothing in-use
2.5 Mt

Clothing retained to next year

Re-use in the UK
0.16 Mt

Clothing damaged during laundry
0.01 Mt

Incineration
0.08 Mt

Re-use overseas
0.38 Mt

Recycling
0.16 Mt

Landfill
0.35 Mt
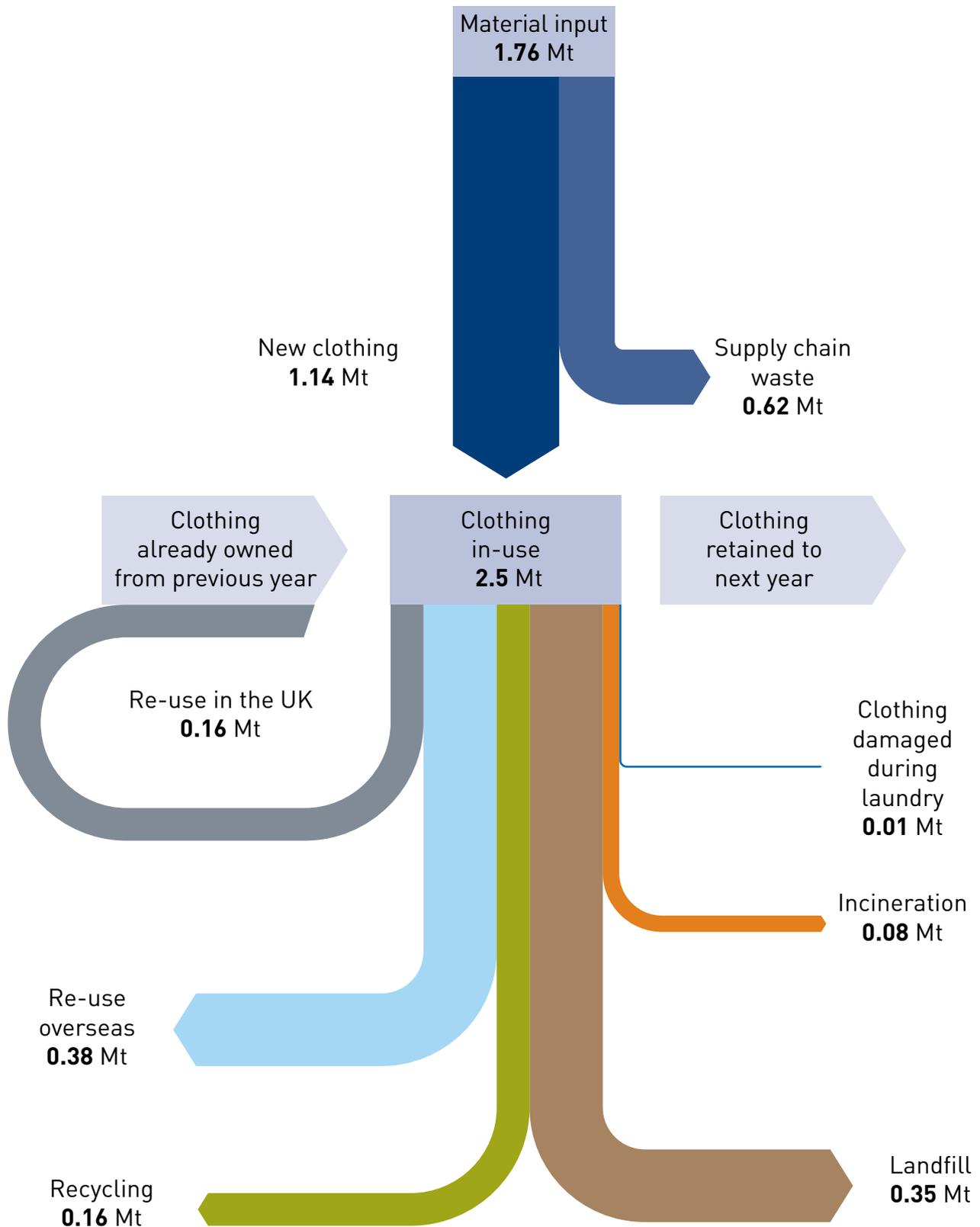
3. What is the potential to cut the footprint of UK clothing?

Our research indicates that a credible set of modest changes across the clothing life-cycle could reduce each of the carbon, water and waste footprints by as much as 10-20%. More ambitious changes could help reduce the cost of resources used to clothe the UK population by one-third, with greater savings still in the carbon and water footprints.

Extending the average life of clothes by nine months would save £5 billion in resources used to supply, launder and dispose of clothing.

The majority of savings would result from actions which are consumer-led or involve both the consumer and businesses. For example, as Figure 6 shows, changing laundry habits is a significant area for carbon savings, while extending the active life of clothing offers the greatest savings overall: if existing clothes last longer, fewer new garments are needed.

Table 2 provides a greater insight into how these reductions were calculated – setting out the actions that could be taken and their potential impact.

Achieving these reductions would not just deliver an environmental benefit. Together, the actions listed would cut the costs of resources consumed by clothing – materials, energy and water – by around 13% a year, or £3 billion at current prices. This excludes any investment costs to achieve some of these savings.

Figure 6. Projected reductions in carbon, water and waste footprints based on implementing good practice
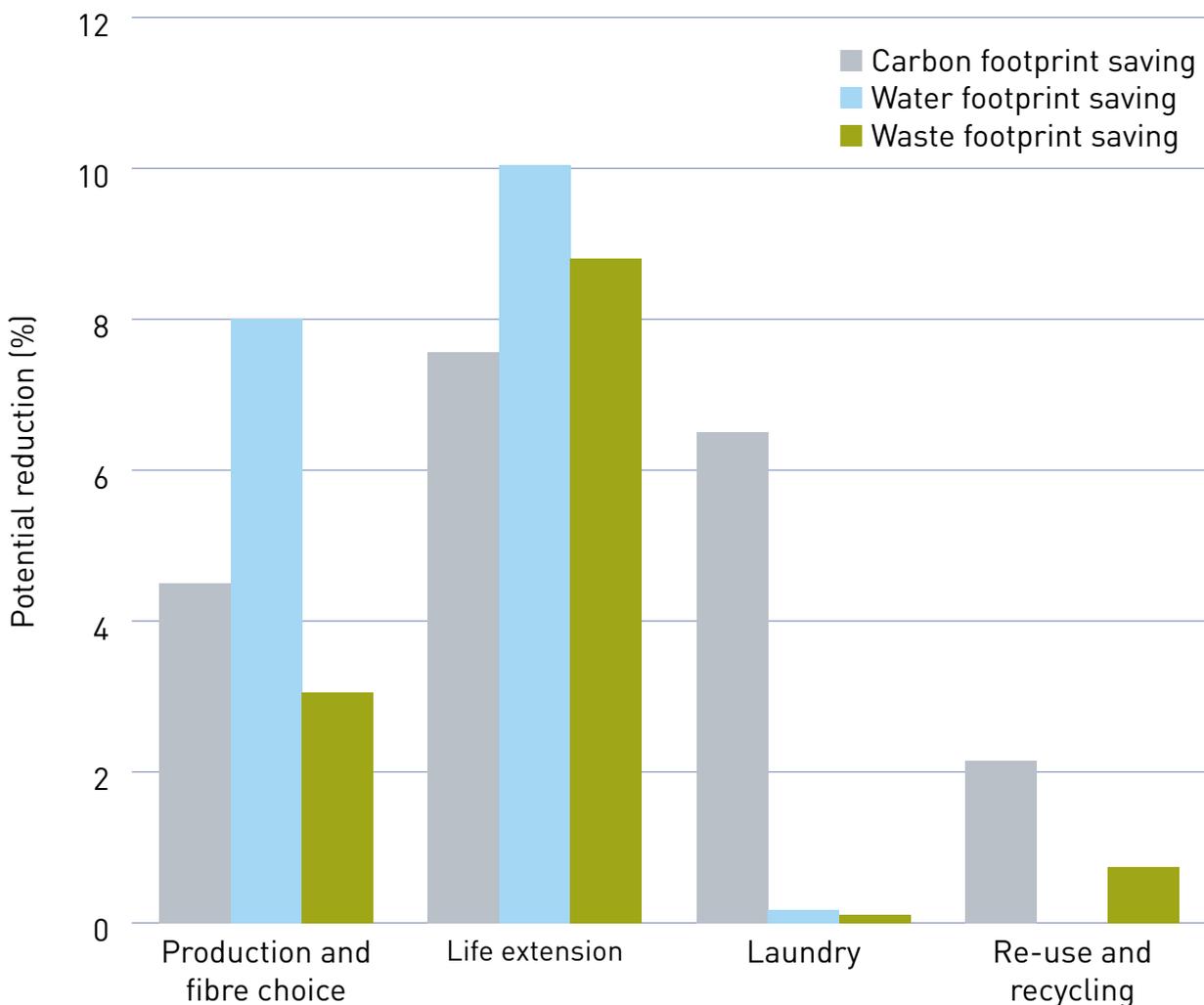
Table 2. Projected reductions in global footprints based on modest changes in consumer habits and business practice

		Materials & garment supply Fibre, yarn, fabric and garment production, distribution and retail			**In-use** Use and re-use, laundry, storage				**End-of-life** Re-use, recycling, incineration, landfill			**Cumulative % saving † (rounded)**
	Actions	Increase efficiency in production processes – reducing carbon and water use by 5% and cutting waste in fibre and yarn production, dyeing and finishing by 50%	Use more synthetic fibres – replacing 10% of cotton used with a 50:50 polycotton blend	Extend the useful life of clothes in the UK through design, use and re-use by 10% – equivalent to 3 months longer use	Wash clothes 10% less frequently	Wash clothes at a slightly lower temperature – reducing the weighted average from its current level (46°C) to 39°C	Use tumble dryer 30% less frequently in summer time	Increase average size of washing and drying loads by 0.3kg (9%) requiring 7% fewer loads	Re-use 5% more clothing at the end of its first life – increasing the proportion of clothes re-used from 48% to 53%	Recycle more fibres back into fibres for use in clothing by introducing 5% closed-loop recycling	Recycle 5% more clothing (to non-clothing uses such as wiping cloths and felts) – increasing the total amount of discarded clothing recycled from 15% to 20%	
Reductions in global footprint (%)	**Carbon**	4.1	0.4	7.7	2.6	1.4	1.1	1.4	0.7	0.9	0.5	**21**
	Water	5*	3	10	0.06	0.03	0	0.04	0	0	0	**18**
	Waste	1.3	1.7	8.8	0.1			0	0.7	0.06		**13**
	Drivers for change	These changes would all help make production more cost-efficient	Retailers and suppliers would be less vulnerable to changes in the market price of natural commodities. Reducing the impact of conventional fibre mixes would be an alternative approach	Consumers get more value out of the clothing they buy – and companies that produce clothes that last and look good for longer gain a positive reputation	Less electricity is required – so laundry costs and emissions are lower				Depending on how the clothing is re-used, this could produce a valuable income stream for charities, merchants and local authorities or new revenue opportunities for retailers	Increased recycling responds to national policy targets		

* This figure is based on EITHER delivering 5% saving by making production processes more efficient in their use of water, OR achieving 6% saving from two specific interventions:
- improved irrigation in cotton production (e.g. increased use of drip feed irrigation) - which could save 1% of the global water footprint for UK clothing; and
- increased treatment of grey water or use of non-toxic textile dyes to reduce the grey water footprint in fabric production by 50%.

† It may not be possible to achieve all savings, as one action could displace the benefits of another to some extent.

Opportunities for businesses and consumers
A. Reducing the resource impact of the clothing sold to consumers

WHY TAKE ACTION?

- Fibre, fabric and garment supply contribute one-third of the waste, half of the carbon impact and over 90% of the water footprint of clothing used in the UK.
- With finite resources such as oil and agricultural land and a growing global population, the global supply chain must get more value from the resources available to meet future demand.
- Four in ten consumers think there is too little environmental information available on the clothes they buy.
- By using improved and alternative fibres, manufacturers could achieve important reductions in footprint.
- 80% of consumers would willingly accept alternative lower-impact fibres that look, feel and cost the same as conventional options.

OPPORTUNITIES FOR BUSINESS

- Retailers, clothing brands and their suppliers can demonstrate corporate responsibility and support their brand values by measuring and reducing the environmental impact of the clothing they sell. This could help gain new customers or increase loyalty.
- By working with suppliers to make small but important changes in production processes such as dyeing, and encouraging good practice through vendor vetting, retailers and brands can reduce the resource impacts of raw material and clothing supply and potentially identify cost savings.
- By specifying the type of fabric used in clothing manufacture, retailers and brands can encourage the take-up of alternative fibres that have a lower environmental impact.

There is opportunity for retailers to win new customers or increase loyalty, if they can gain a reputation for providing clothing that is made responsibly and has lower impact on the environment.

There are three potential areas where retailers can take action around clothing design and materials/product sourcing to try and gain such a reputation – each of which has associated benefits and challenges. These are:

- working with fibre, yarn, fabric and garment suppliers (mostly located overseas) to encourage increased process efficiency and lower impact;

- specifying products which inherently have lower impact, e.g. using alternative types of fibre or lower-impact versions of existing fibres (where cost-effective); and

- providing customers with more information about the environmental impact of clothes so that they are able to make an informed choice of garment or brand.

Encouraging lower impact in the supply chain

Given that materials and garment supply accounts for such a significant proportion of the carbon, water and waste footprints of UK clothing, it would seem only logical that this stage would offer the greatest opportunities to reduce resource use and waste. But in reality, production processes are already often highly efficient and so offer limited scope to cut resource use. What's more, in a truly global clothing industry where 90% of supply is from overseas, UK retailers have limited influence over suppliers. In fact, in multi-tier supply chains, the retailer often has no direct working relations with many of the suppliers lower down the chain, such as fibre producers.

Nonetheless, opportunities can be grasped around new supplier selection (via selection criteria, accreditation requirements and inspection visits), and by including resource use within assessment processes for existing suppliers, such as:

- audits for technical production processes (e.g. checking the discharge of toxic chemicals into water supplies);

- audits of social and ethical practice; and

- supplier guidelines, code of conduct or code of practice documents.

Incentives here can be difficult to establish: initiatives such as product traceability and vendor vetting may take some years to put in place and even longer to deliver savings. While production practices that require less carbon and water and generate less waste may be able to reduce resource costs by a small percentage, retailers and brands are unlikely to make much financial gain. Therefore, a primary driver for retailers to support such change is the potential reputational gain from selecting less resource-intensive production routes, while reducing their exposure to longer-term business risks around raw materials supply.

Reducing resource consumption by using lower impact fibres

Another way to reduce resource use is by using different fibres or lower impact versions of conventional fibres. Research suggests that some man-made fibres such as polyester and polyamide tend to have lower carbon footprints than natural fibres. Natural fibres also typically create slightly more waste in the production process than man-made fibres, as Table 3 indicates.

Table 3. Variations in footprint by fibre type – modelling estimates

Fibre type	Average footprint per tonne of fibre in clothing		
	Carbon (tCO$_2$e)	Water (m^3)	Waste (t)
Cotton	28	3,100	1.6
Polyester	21	80	1.4
Viscose	30	3,800	1.6
Acrylic	38	130	1.4
Wool	46	2,200	1.6
Polyamide (nylon)	24	80	1.4

The footprint data do not take account of differences in durability and water retention between fibres. There are little data on water use in the production of synthetic fibres.

While these figures do not tell the whole story – the footprint of a garment made of a certain fibre will vary widely depending on factors such as production processes and how consumers wash and dry their clothes (e.g. cotton clothes are more likely to be tumble dried than wool or silk) – they do indicate an opportunity for UK retailers and suppliers to reduce resource use by specifying the use of alternative fibres or lower impact versions of conventional fibres. For example, by switching 10% of cotton fabric to a 50:50 polycotton blended fabric manufacturers might achieve a 2% saving in waste produced, reduce water footprint by 3% and cut carbon emissions by 0.4%.

Lower-impact production opportunities – there are now a number of lower impact and more sustainable versions of conventional fibres available, such as recycled polyester, or cotton meeting the standards of schemes such as the Better Cotton Initiative, the Global Organic Textile Standard, or Cotton Made in Africa. Production capacity is currently limited, but these are areas that offer potential for retailers and brands to reduce resource use.

Demonstrating corporate responsibility with improved environmental information

According to WRAP research, the environmental impact of a garment is one of the least important criteria for consumers when deciding on a purchase. Yet nearly four in ten consumers think there is currently too little environmental information available about the clothes they buy. What's more, there was a clear indication that – providing other purchase criteria were met – customers would be willing to buy clothing that is better for the environment.

Clearly, no retailer would want to change to a different fibre if this would reduce the appeal of clothes to the market. To test consumer views on fibre choice, WRAP's survey asked respondents whether they considered cotton or polycotton to be better for the environment. 55% thought cotton, 6% thought polycotton, and three in ten adults said they didn't know – where in actual fact cotton typically has a relatively high water footprint. However, 79% of respondents said they would consider an alternative which looked, felt and cost the same and offered a lower impact. There are no simple answers when assessing the overall environmental and social impact of an individual fibre or garment – and valid considerations include whether the fibre derives from a renewable resource and the importance of agriculture to developing economies. Moreover, the data to inform fibre choice are incomplete, and WRAP research shows that the environmental impact of a garment is not an important factor for consumers at point of sale.

Therefore, perhaps more relevant is information about the overall environmental performance and policies of a retailer. This can help establish their reputation as a responsible, sustainable provider and means that, instead of needing to check every garment, consumers can make informed choices to support retailers that have such a reputation.

Key purchase criteria – when consumers buy clothing, the most important criteria are deemed to be value for money, the look and feel of the material, the right fit, providing room to grow and something they would wear frequently.

The Sustainable Apparel Coalition is developing an index that will include the environmental impact of fibre choice, to increase operational efficiency and inspire better product design. (www. apparelcoalition.org)

Opportunities for businesses and consumers
B. Extending the useful life of clothes

? WHY TAKE ACTION?

- Extending the life of clothing by an extra nine months of active use would reduce carbon, waste and water footprints by around 20-30% each and cut resource costs by around 20% (£5 billion); this is the single most significant intervention.

- Value for money is the most important purchase criterion for consumers: over a third would like to do more to buy clothes that are made to last.

- In the average household, some 30% of clothes, costing over £1,000 to purchase, have not been worn for at least a year, most often because they no longer fit – four in five adults own some items which they no longer wear due to fit or need for alteration.

£ OPPORTUNITIES FOR BUSINESS

- Retailers and brands could focus on a quality positioning by offering customers more durable garments – consumers would seek longer lasting clothes, particularly if they have confidence in the brand, if a guarantee is offered or a durability indicator on the garment label.

- There may be an opportunity to win customers or increase loyalty by designing clothes which offer a versatile fit and adapt to changes in body shape.

- A range of new business opportunities and revenue streams could be opened up by offering customers more ways to make better use of existing clothes – a quarter of consumers would be likely to wear clothes they haven't worn if they were able to update their appearance or had easier access to tailoring services. There is also significant interest in learning about repair.

OPPORTUNITIES FOR CONSUMERS

- To obtain better value for money by looking for garments and brands which offer increased durability and a versatile fit.

- To make better use of existing clothes by looking for new ways to wear them (different combinations, accessories etc.).

In the UK, the estimated average lifetime for a garment of clothing is 2.2 years, or just under two years and three months. Extending the active life of clothing by nine months can make a substantial difference to its resource impact. In fact, increasing the lifetime for which clothing is actively used and re-used is one of the most effective actions to reduce footprints for carbon, water and waste – as well as offering valuable savings on resource costs, as Table 4 shows.

Table 4. Potential footprint reductions and resource cost savings from using clothes for longer

Scenario	Carbon saving*	Water saving	Waste saving	Resource cost saving
10% longer lifetime (i.e. 3 months longer)	8% (3 $MtCO_2e$)	10% (600 million m³)	9% (150,000 tonnes)	9% (£2 billion)
33% longer lifetime. (i.e. 9 months longer)	27% (10 $MtCO_2e$)	33% (2,000 million m³)	22% (400,000 tonnes)	22% (£5 billion)

* The saving would be reduced if life extension increased the manufacturing burden, e.g. through the use of heavier fabric

But as well as offering environmental benefits, extending the life of clothing is also something that consumers want. In WRAP's survey, consumers said that one of the top criteria they use in buying clothing is finding items that are 'made to last and look good for longer'. 57% of respondents said that they regard buying good quality clothes as a 'sound investment', and only 21% of consumers said they consider the latest trends in fashion as influential when buying clothes.

Consumers value quality, but don't know how to measure it – WRAP's survey found that most consumers are interested in buying good quality clothes, while only a third 'usually' examine seams and stitching before purchasing.

What makes a garment last longer?

A number of factors can impact on whether a garment looks good and is used for longer. These include:

- how owners look after their clothes, e.g. whether they follow washing instructions and care information;

- willingness to wear the same item repeatedly, e.g. as part of different outfits, or to buy pre-owned clothing;

- design features such as classic cut and fit, and cutting or built-in adjustability (e.g. hidden elastic, stretch fabrics) to promote comfort and a flattering versatile fit;

- technical aspects such as resilient fabrics, dyes and colours – the fact that man-made fibres are a popular choice for uniforms suggests they are associated with increased durability; and

- consumer ability to repair or alter clothes.

WRAP's survey found high levels of consumer interest not only in buying clothes that last longer but also in extending the life of clothes by repairing them or updating them. However, consumer interest in clothing longevity is affected by a lack of recognised ways of measuring and communicating the quality and value for money of a garment (e.g. 'lasts 50 washes'). Over a third of respondents indicated they could do more to buy clothes that are 'made to last' – and would like to do so. Apart from higher income, the factors most likely to increase this buying behaviour (each cited by around one-third of respondents) would be:

- associating particular brands with providing longer-lasting products;

- having a lengthy guarantee against faults; and

- a 'durability index' on the garment label.

For retailers, the value of this is as yet unclear: there is a lack of robust evidence around whether increasing durability of clothing will increase production cost significantly – while retailers and consumers alike know that some low-cost garments wear well over a long time and frequent washing. However, there is significant potential in being recognised as a brand whose clothes look good for longer.

Getting more use out of existing clothes

WRAP's survey found that the average person estimates that they own £1,800 worth of clothing. Based on the UK average of 2.3 people per household, this works out at around £4,000 of clothing per household. However, some 30% of these clothes had not been worn during the past year:

- 57% said they hadn't worn clothes because they no longer fit;
- 46% cited wear and tear;
- 44% said they had clothes in their wardrobe 'for formal occasions only'; and
- 41% said they had kept clothes simply because they 'haven't got round to throwing them out'.

Changing styles, the generation gap – some 58% of people aged 16-24 said they own unworn items that are 'no longer my style/taste' – compared to 36% overall.

A quarter of consumers would be likely to wear clothes they have not worn if they were able to update their appearance e.g. using new accessories, or if more high street shops offered tailoring services (e.g. to make them fit). Also, while nearly three-quarters of people are able to sew a button on and nearly half can darn or patch a hole, or take a hem up or down, over half of women and nearly a quarter of men expressed an interest in learning more about how to repair clothes.

This suggests a business opportunity – for large retailers and a range of smaller businesses across the clothing sector – to help consumers make better use of their existing wardrobe, e.g. by increasing the availability of services such as styling, repair and alterations and equally importantly, increasing consumer awareness of such services where they already exist.

Around 1.7 billion items of clothing in UK wardrobes have not been worn for at least a year.

Opportunities for businesses and consumers
C. Increasing supply and demand for pre-owned clothing

WHY TAKE ACTION?

- Around half of clothing is re-used at present, and over two-thirds of this goes overseas. Increasing the re-use rate in the UK and for export would reduce the total waste each year.
- There is significant willingness to buy or receive pre-owned clothes – more than two-thirds of adults have done so in the past year.
- Some 30% of clothing has not been worn for the last year and four in five people own at least some clothes that have not been worn because they no longer fit or need altering. This indicates there may be a substantial volume of good quality clothing suitable for re-use.

OPPORTUNITIES FOR BUSINESS

- There appears to be a significant commercial opportunity to sell more quality pre-owned clothing in the UK. WRAP survey results show considerable consumer interest in the opportunity to buy quality 'pre-owned' clothes.
- Retailers may be able to incentivise consumers to release the value in unwanted quality clothing. Research indicated that many people would be interested in the opportunity to sell clothes back to retailers.
- There may be a market opportunity to make more high-end clothing readily available for hire on the high street.
- Organisations which collect clothing for re-use have the potential to increase their revenue.

OPPORTUNITIES FOR CONSUMERS

- To get better value from household expenditure, help the environment, experience the buzz of going shopping and wear clothes that are 'new to me' – by buying pre-owned clothes.
- To realise the value of unwanted clothing by selling it or by donating it to charities or other organisations for re-use or recycling.
- To access a wider choice of fashionable clothes for social occasions – through hiring, exchanging clothes with other people or by purchasing quality pre-owned clothes through charity shops, online sellers, vintage shops and other retail outlets.

Routes to clothing re-use in the UK are well established. As well as being sold by charities, clothing is sold online and passed on to friends and family or through informal networks and community groups, such as mother and toddler groups. WRAP's survey found that:

- over half of adults in the UK have bought pre-owned clothes in the last year to wear for daytime leisure or going out and socialising;

- nearly seven in ten respondents with children have purchased pre-owned children's clothing; and

- the most common sources of pre-owned clothes are charity shops (over a third of respondents) and online sites such as eBay and Gumtree (over a quarter of respondents).

However, despite this readiness to buy pre-owned clothing, WRAP estimates that currently just under half of clothing in the UK is re-used at the end of its 'first life', as opposed to being thrown away. An estimated 14% of the clothing which first owners no longer want is re-used in the UK: the majority of re-use takes place overseas. WRAP's survey suggests an opportunity to increase re-use in the UK if more quality clothing can be collected. Almost a quarter of respondents indicated they would be more likely to wear more pre-owned clothes if there was a better choice (23%), and around a sixth said they would wear more pre-owned clothes if more fashionable items or a wider range of sizes were available. In short, the potential UK market for pre-owned clothes could be considerable.

For retailers, addressing this may seem counter-intuitive; after all, any increase in the sale and use of pre-owned garments might reduce the number of new garments sold. Previous WRAP research has estimated that two purchases of pre-owned garments may displace one new purchase (see WRAP, 2011). Yet opportunities may exist in other ways to increase sales value – such as by growing sales of higher quality garments (i.e. clothes which are more durable and easier to repair and alter or update), and by promoting services such as repairs and alterations, hiring/leasing and retailer 'buy-back' schemes. Such activities could bring jobs that stimulate the UK economy.

The environmental importance of clothing re-use

Clothing re-use is far better for the environment than recycling: for every tonne of cotton t-shirts re-used, 12 tonnes of CO_2e are saved – compared to less than 1 tonne of CO_2e saved by recycling the same quantity. Therefore, an increase in collection services for quality clothing provides a business opportunity with significant environmental benefit.

A buzz from buying clothes – nearly half of adults in WRAP's survey said they 'get a buzz' when buying new clothes. It is possible that the same buzz could be gained by buying pre-owned clothes that are 'new to me' – reducing the cost to customers and increasing the environmental benefit.

Hiring and leasing

Relatively few people currently hire or lease clothes. During the past year, the only types of clothes that more than one in ten people hired were formal wear (13%) and fancy dress (11%). For leasing (i.e. for a longer period, as opposed to a single occasion), the proportion for all clothing types is 2% or less. Around half of respondents say they would consider hiring clothes more frequently if it was easier to do so – for example, through major high street retailers.

A major opportunity: hiring designer dresses – around one-quarter of people aged 16-24 and one-quarter of women would be interested in the opportunity to hire celebrity or designer dresses – enabling them to wear something they normally could not afford.

23% of respondents indicated they would be more likely to wear more pre-owned clothes if there was a better choice.

Looking at new business models for clothing re-use

WRAP commissioned modelling work to assess the commercial viability of five alternative business models which would facilitate re-use of clothing:

1. retailers or manufacturers providing repair and upgrading services for their own garments;

2. retailers providing radical new large-scale leasing services (e.g. for baby clothes, similar to a service available in Germany);

3. retailers providing radical new large-scale services for one-off hire;

4. retailers offering a re-use section for own-brand garments within their store; and

5. peer-to-peer exchange.

A full report on the results of these models will be published in 2012, and each has clear potential.

The model with the shortest payback period for retailers would be model 4 – where a retailer offers an incentive for customers to return their used garments to a store for subsequent re-sale. Not only is this commercially viable over the short and long term, it is also one of the most effective at generating waste savings over the long term.

Most importantly of all, WRAP's research indicated a strong consumer interest in such schemes: two-thirds of respondents would consider using a retailer 'buy-back' scheme; women and people aged 16-34 are especially interested. The types of clothes people most want to be able to sell back are formal wear, clothes for going out and socialising, designer clothing and winter or summer clothes. Crucially, there is also interest in buying returned clothes, particularly formal wear, designer clothing and clothes for going out; more than a third of respondents would consider buying clothes in these categories.

Opportunities for businesses and consumers
D. Reducing the impacts of laundry

WHY TAKE ACTION?

- Laundry creates around one-quarter of the carbon footprint of clothing or 3 tonnes of CO_2e per tonne of clothing as a result of energy use.

- A combination of good practice – lower wash frequency, lower wash temperature, less tumble dryer usage in summer time and larger loads – could cut the footprint by 7%.

- This would potentially save the average household £10 on their annual energy and detergent bills.

- Many people already follow laundry practices which lower the carbon footprint, and are willing to adopt further good practice.

OPPORTUNITIES FOR BUSINESS

- Retailers, brands and detergent manufacturers can build their reputation for service and reflect brand values by offering customers consistent, authoritative advice on how they can save money, take care of clothing and reduce their impacts when doing laundry.

- New opportunities may exist in selling clothes which are easier to wash and dry – more than a third of people would use a tumble dryer less if more clothing was made of fabrics that dry quickly.

OPPORTUNITIES FOR CONSUMERS

- To reduce damage to clothes in the wash by checking on garment labels: one in ten people have not worn clothes because of fading, stains and garments losing their shape in the laundry.

- To reduce the costs of laundry.

WRAP's research underlines that many people already adopt laundry practices which reduce environmental impacts:

- Nine in ten respondents wait for a full load either 'always' or 'more often than not'.

- Around three in five wash clothing at 30°C or less at least 'half the time', or sort their washing according to temperature at least 'half the time' – 75% 'mostly' wash clothes at 40°C or less.

- Over 40% of people who own a tumble drier don't use it in the summer.

- Nearly all adults will wear at least some clothes more than once before putting them in the laundry, notably jeans, trousers, knitwear and fleeces.

Research found that there is a clear willingness amongst consumers to take further action in these areas. For example:

- More than a third of those who use a tumble dryer would use it less if more clothing was made of fabrics that dry quickly (35%).

- Four in ten would 'seriously consider' wearing more clothes a second time before washing, especially young people. The greatest influence is odour – nearly half would do so 'if my clothes smelt fresher for longer'.

- Around a third would seriously consider washing their clothes at 30°C more often, the key factor being cleanliness – six in ten would do so 'if I felt my clothes would be clean'.

There is an opportunity for retailers and brands to show leadership, providing clear and consistent advice on laundry practice, clarifying hygiene issues (e.g. for washing sportswear) around topics such as washing temperature, and providing information on fabric choice (e.g. which fabrics dry fastest).

Water and waste impacts of laundry

Laundry accounts for less than 1% of the global water footprint of UK clothing (i.e. the net consumption of water). Changing laundry habits would deliver a small saving. However, reducing the amount of water used in washing could be important in times of drought.

Laundry is also estimated to create relatively little clothing waste – with fabric damage during washing and drying accounting for less than 1% of the overall footprint. However, this figure may underplay the link between laundry and clothing longevity.

Opportunities for businesses and consumers
E. Keeping clothes out of landfill

WHY TAKE ACTION?

- More than 30% of clothing is estimated to go to landfill.
- If all this material was donated for re-use or recycling, it would provide £140 million or more at current prices.
- Nearly half of adults put at least some clothing in the bin – usually because they think it couldn't be used again for any purpose, or it's too personal to get rid of in another way. They would do this less if they knew that the textiles themselves – in any state – were valuable to charities and recyclers.

OPPORTUNITIES FOR BUSINESS

- Charities, retailers, local authorities and others can gain an income from textile resale – either as pre-owned clothing in the UK, or by selling it to textile merchants for export.

OPPORTUNITIES FOR CONSUMERS

- To keep clothes out of the bin by using local authority, charity or other services – and not just the good quality garments, as even heavily worn or damaged clothing can be collected by some services and recycled for a range of uses.

Every year, an estimated 31% of end-of-life clothing – some 350,000 tonnes – goes to landfill. That's despite mixed rags having a resale value of £410 per tonne, and wearable garments an even higher value. If all this material was donated for re-use or recycling, it would provide £140 million or more at current prices*. Yet this high level of disposal is in contrast to the fact that a majority of consumers already do seek to send the clothing they no longer want for recycling or re-use.

According to WRAP's survey:

- almost three-quarters of people have donated some items to charity during the past year (73%);

- 42% have used doorstep collections organised by a charity;

- 37% have placed clothes in a textile recycling bank;

- 35% have donated clothing to friends or relatives;

- 33% have taken clothes to a household waste recycling centre; and

- 21% have sold clothes online.

When people sell clothes – the most important determinant of whether people would try selling unwanted clothes (30%), is the likelihood that they get a 'reasonable amount' of money, although around a quarter would do so if they had more spare time.

Nearly half have put at least some clothing 'in the bin', and a few have discarded most of their unwanted clothing in this way (7%). Most commonly, this was because they believed the item had no further possible use – and a quarter of respondents felt the items they put in the bin had no monetary value. Some 35% of survey respondents confirmed that they would donate unwanted clothes more often to an organisation which would re-use or recycle them if they thought that damaged or heavily worn clothing was valuable to such organisations.

This is indicative of a lack of understanding that such clothes – even if not suitable for re-use – can often be recycled, and that organisations can gain revenue from selling 'bulk' textiles for recycling. The key opportunity therefore lies in making it clear to consumers that various organisations do welcome such clothing, and have a use for it. This needs to be supported by providing convenient collection methods, which keep clothing in good condition wherever possible.

By overcoming this perception barrier, charities, local authorities and other organisations can increase the volume of clothing available to them for recycling – and so gain more revenue from textiles in addition to any income from clothing that is resold.

*Materials prices as at June 2012

4. What happens next

This report has set out a number of opportunities for the clothing sector to reduce carbon emissions, resource use and waste – and gain business benefit from doing so. While many of the opportunities are up to businesses themselves to evaluate and take forward, one action that organisations across the sector can take is to sign up to the forthcoming Sustainable Clothing Action Plan 2020 Commitment.

'This report shows how we can all value clothing more, saving money and reducing environmental impact. The clothing sector is already working to reduce the impact of clothing, and together we will take forward more ideas which deliver real benefits to us all.'

Liz Goodwin, CEO, WRAP

The 2020 Commitment is being developed by WRAP along with organisations from across the clothing sector under the Sustainable Clothing Roadmap. Coordinated by WRAP on behalf of the UK Governments (England, Scotland, Wales and Northern Ireland), the Roadmap brings together clothing retailers, brands, suppliers, local authority representatives, recyclers, charities, trade bodies and the public sector to look at how to reduce the impacts of clothing while meeting consumer expectations.

To date, these organisations have reviewed the evidence for taking action and collated their own good practice. The 2020 Commitment is the next step – an agreed set of voluntary actions and collective targets based on the opportunities outlined in this report, including:

- choice of fibres and fabrics;

- designing clothes to increase their useful life and reduce laundry impacts;

- working with supply chain partners to increase efficiency and reduce footprint;

- providing consumer information on garment longevity and re-use, laundry practice and choosing clothes with lower impact;

- increasing clothing collections, re-use and recycling rates; and

- measuring and pursuing footprint reductions as part of mainstream corporate processes.

The 2020 Commitment will sit alongside other sector initiatives, such as the Ethical Trading Initiative, the Greenpeace 'Detox' commitment and the work of the Sustainable Apparel Coalition on supply chain monitoring, and will support the UK Governments' policy objectives on carbon emissions, waste prevention, zero waste and reduction in ecological footprint. It will be underpinned by the evidence in this report, and the associated technical data report, to help prioritise actions and support provision of consistent information by the industry to consumers.

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