



UniformReuse.co.uk Resource Report

Design for End-of-Life Guide for Corporatewear Garments

Introduction

Until now, designers of corporatewear have been driven by the main requirements of the primary users (the providers and wearers of the garments): Image, functionality and cost. However, the corporatewear sector is becoming affected by issues of sustainability, and needs to consider environmental, social and economic objectives such as resource efficiency and waste management. This document outlines a *Design for End-of-Life Tool*¹ which can be used by design and product development teams - and other corporatewear stakeholders - to improve sustainability across the sector.

Designing Corporatewear Garments for Different EoL Paths
Consider the following three questions:

- 1) What are the primary user's most important specifications?
- 2) For what reasons will the garment be discarded?
- 3) For how long is the garment expected to be usable?

As well as informing the garment designer about what the primary user really needs, answering these questions will help to determine the fabrics to be used, and the likely condition of garments at EoL. This information affects the design decisions which will help either lengthen the life of the garment 'as is' (reuse) or make it easier to use as resource in other products (recycling) or in energy production. The Design for EoL Tool (see landscape page 2) ranks these different EoL 'paths' and describes the design choices that can affect which EoL path is chosen for a particular garment.

Path 1 Could the garment be designed to require fewer resources?

From the outset, design the garments to maximise fabric utilisation and minimise waste. Optimise the pattern cutting process, and avoid any unnecessary trims and/or embellishment.

Path 2 Could the garment be reused 'as is'?

The best strategy for garments at EoL is to maximise the ability to reuse them in their original state. There are several design choices which can support reuse 'as is', such as:

Material choice

Use materials that are durable or easy-care. Using blended fabrics or coated materials can improve reusability but make it very difficult to recycle at EoL. Design garments in materials that are easy to repair or refurbish to improve reusability.

Garment construction

Improve durability by using construction and joining methods which withstand wearing and washing. Also, consider ways to enable repair, refurbish or modifying operations.

- Which parts are likely to wear out first, and could these be replaced easily?
- Could the garment be modified to meet the needs of a secondary user?
- Can used garments be returned to their original quality?

Conforming to corporate identity regulations

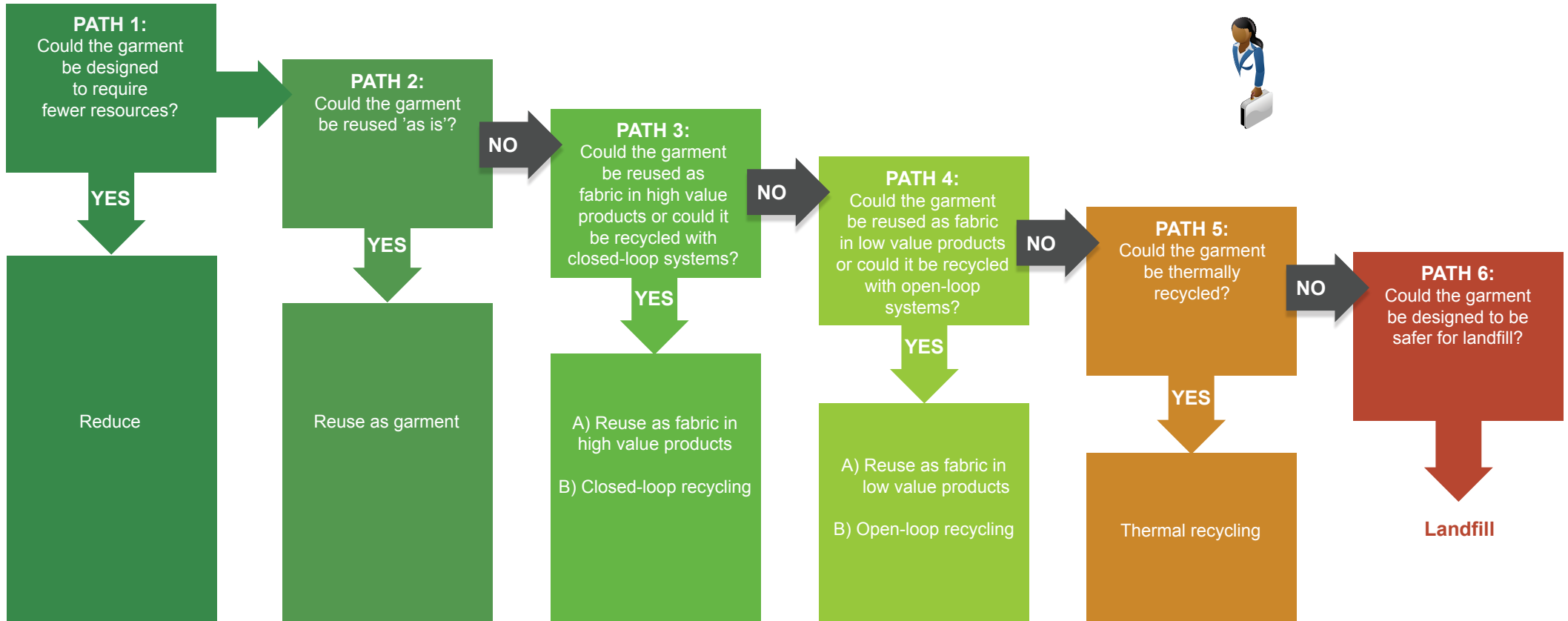
To avoid additional taxation in the UK, corporatewear garments must carry a 'tax-tab': a permanent and clearly visible corporate logo. To enable reuse outside the primary company, design garments with²:

- Easy-to-detach logos and subtle branding that can be removed or hidden at EoL.
- Tax-tabs or sewn labels that can be cut off, or logos on detachable pockets that are simpler to remove at EoL.

¹ End of Life (EoL): The stage at which a garment is discarded from its primary use, but is still capable of being diverted into reuse, recycling or incineration rather than being disposed of to landfill.

² Design decisions regarding logos need to be approved by Tax Authorities.





SAVED RESOURCES

RECOVERED RESOURCES

LOST RESOURCES



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Path 3

Could the garment be reused as fabric in high value products or could it be recycled with closed-loop systems?

Corporatewear garments are often made from high value fabrics because of quality or performance requirements. Thinking about EoL issues will inform decisions made at the design and selection stage:

Reuse of garment fabric

Select garment styles and materials that can easily be modified to change their look, feel or performance. This can make reuse of the fabric more viable. If materials were easily identifiable at EoL through labelling, their characteristics could be utilised in new products in the most appropriate way.

Closed-loop recycling

Recycling breaks fabrics down into fibres which are used as feedstock for new materials. 100% polyester materials can undergo closed-loop recycling, in which a chemical recycling system is used to turn the original garment into recycled materials that can be used in garments similar the original ones. (Zips, buttons and other non-textile components are separated out before the melt down process.) For this EoL system, design garments out of pure polyester fabrics (some polyester-rich materials can also be processed).

Path 4

Could the garment be reused as fabric in low value products or could it be recycled with open-loop systems?

Designing garments for fabric reuse in low value products (e.g. industrial wipes) is essentially the same as designing for high value reuse, except that properties of durability or easy-care are less important. With open-loop recycling, the quality of the materials will change:

Mechanical recycling

Textiles are shredded, pulled and carded to be made up into 'new', lower quality fibres that can be used in non-woven products (e.g. mattress fillings) or spun into new yarns. Use loosely knitted or woven fabrics, which are easily shredded, and longer fibres can be recovered. Fine, high twist yarns, tightly woven fabrics and blends containing elastic materials are the hardest to recycle mechanically.

Plastics reprocessing

This recycling process results in fabric made up from recycled PET plastic (polyethyleneterephthalate) from sources such as drinks bottles. The quality of final material depends on the exact process used.

Composting

In principle, composting could be an environmentally-friendly EoL option for biodegradable textile fibres but, at present, UK composting facilities don't allow normal fabrics to biodegrade quickly enough. Things may change, so start using only cleanly biodegradable materials (or make non-biodegradable components easy to remove before composting).

Path 5

Could the garment be thermally recycled?

Garments are incinerated to extract and use the energy they contain. Thermal recycling 'ranks' lower than reuse or recycling because of the modest levels of energy recovered and the possibility of emissions. However, if the materials in a garment can't be reused or recycled, thermal recycling is the next best EoL option.

Thermal recycling

Aim to maximise the energy potential of the garments and to minimise the negative impacts of incineration. Choose materials which are easy to incinerate and which have a good calorific value (i.e. mainly synthetic fibres), and use fabrics which are free from chemicals that will release toxic gases.





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Path 6

Could the garment be designed to be safer for landfill?

If all else fails, disposal to landfill is the final EoL option. Landfilling garments should be avoided if at all possible: not only is it a loss of resources, it can cause significant environmental harm. These are the aspects to consider:

Disposal to landfill

Choose materials which will have minimal negative impacts if landfilled:

- Biodegradable materials release greenhouse gases (e.g. methane) on degradation in landfill.
- Avoid fabrics containing chemicals which might release toxins as they degrade.
- Synthetic materials that will not degrade, or do so only very slowly, are the safest ones to landfill (although their longevity causes other issues).
- Remember: design for landfill IS A LAST RESORT

Achievable Benefits

General principles when designing corporatewear for different EoL paths:

- Avoid waste! Make maximum efficient use of resources
- Avoid materials containing hazardous chemicals
- Develop a labelling system which enables accurate identification of the materials at EoL.

The easiest and 'best' EoL strategy for corporatewear garments is reuse 'as is', but garments can also be reused as fabric. To improve reusability:

- Consider the durability and ease of care of garments
- Use subtle branding and logos that are easy to detach at EoL
- Design garments that are easy to repair, refurbish and modify.

The most suitable recycling options for corporatewear garments are chemical and mechanical recycling:

- To improve recyclability with chemical systems, choose materials approved by existing chemical recycling systems
- To improve recyclability with mechanical systems, choose fabrics that are easy to shred.

In an ideal world, used corporatewear garments would be reused and reused again, and finally recycled efficiently back into their original materials, or composted safely.

Keep this as a long term goal!

