



Arts & Humanities  
Research Council



## **PROJECT REPORT**

### **Worn Again: Rethinking Recycled Textiles (2005 – 2009)**

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#### **Introduction**

The *Worn Again* project aimed to investigate textiles recycling, looking to the textile design researcher/practitioner to propose significant change through the creation of high quality artefacts. The project was designed for the TED group at Chelsea, intending to support both individual and collaborative action, and to build the research expertise and culture for textile staff and students at the college.

The project offered the research community in this field a model for practice-based research for the upcycling of textiles. This was an iterative process where by design-led explorations tested existing sustainable design theory, leading to the development and adaptation of appropriate research methods, and creating new models for practice-based research. This in turn led to the creation of new artefacts which embodied the thinking, and further reflection and redesign methods led to the proposal of new sustainable design theory.

When the project began in 2005, design practices in textiles recycling were limited to recutting / reshaping / restitching, often giving a somewhat patch-worked aesthetic to the remade product. At the other end of the scale, commercial and technical approaches tended to break the original textile down and remake it into a new fabric. This project embraced both of these approaches, but also sought to question the design decisions that were inherent in this activity. Through the project the researchers sought to both create new design methods for recycling, and also to give the resulting artefacts a new, 'higher value' aesthetic.

#### **Seeds of Change**

*'We hope that the exhibition will sow the seeds of change for a more ecological and ethical approach to fashion'. (Earley 2006)*

The Craft Council's 2006 *Well Fashioned* exhibition examined the various ways in which 21 UK fashion designers approached eco fashion design and production at the time, from materials and processes to concepts and techniques. Some outfits on show used 'green' materials, whilst other exhibitors considered the ecological value of synthetic fabrics and biodegradable and recycled plastics. Given that the majority of a garment's impact on the environment occurs after the item has left the shop, an important part of the exhibition looks at the role of the consumer. The integrity of what we wear was questioned at every level with examples of fair trade fashion alongside collections that both reinvent and preserve traditional UK making techniques. Many of the designers included political and ethical messages in their work, and run their small companies by adhering to a green or social ethos.

Well Fashioned also included designers who created recycled and customised clothing, and it was through the curation of this section that the ideas for the research project were formed. It became clear

that the quality and finish of work in this ‘end of the lifecycle’ section indicated that there was room for the designers who were reusing textiles to do so with more thought and skill. The idea for the *Worn Again* project effectively drew together the key questions in the exhibition, from all stages of the lifecycle as it was represented there, and asked the design researchers in the project to examine them more thoroughly, and in an interconnected manner. Ultimately the remit was to improve the design process for recycled textile products, whilst also addressing the aesthetic and market appeal of such products.



*Well Fashioned* exhibition poster by Studio Myerscough, for the Crafts Council, London.

## The Research Questions

Twelve designers were asked to create recycled textile products that would have value added to them in the course of recirculation. All the research questions were concerned with exploring new approaches to the recycling of textiles; designing and producing artefacts with strong aesthetic appeal that were contemporary and innovative, and that had improved eco credentials. The project intended to explore both the ‘hard’ and ‘soft’ aspects of eco textile design, with the established principles of material and processes being considered, but also the technical and conceptual ideas. At the outset the project was concerned with the following questions:

1. Ethical Production - How can designers work with ethical production values and systems to create a recycled textile product?
2. Technology - How can emerging technologies be used to create recycled textile products?
3. Long Life / Short Life, or ‘Fast’ and ‘Slow’ Textiles - How can recycled materials help lengthen and shorten the life of a textile product thereby promoting resource efficiency?
4. Design Systems and Services - How can new systems and services around textile recycling and recycled products be designed and implemented?

Stage three of the project also addressed two additional questions:

5. Multifunction and Detachability – How can designers design textiles and textile products that have multiple uses and detachable elements, thereby promoting resource efficiency and product longevity?
6. Design Activism – How can textile designers redefine and extend their role within the design community and consumer society?

### **Design-Led Upcycling**

*"Upcycling stands in contrast to recycling. We upvalue products innovatively, instead of just reusing them."* (Strobel as cited in Goldsmith 2009)

Murray (2002) states that design for upcycling is about 'not merely conserving the resources that went into the production of particular materials, but adding to the value embodied in them by the application of knowledge in the course of their recirculation.' So, if one can add value – economic, intellectual, emotional, material – to a product through the process of reuse, it can be called 'upcycled'. The notion of upcycling was popularised in 2002 through the publication of William McDonough and Michael Braungart's seminal book, *Cradle-to-Cradle*, and was discussed therein by referring to rice husks and paper. These were upcycled in different ways: the paper was remade as a higher-grade product through technical processing, and could be seen as 'material upcycling'; whilst the rice husks were reused in a different context (from non combustible packing material to naturally fire retardant building material) and could therefore be seen as 'design-led upcycling'.

During the early stages of this project the aim became to upcycle rather than recycle textiles, thus exploring the potential to create an economic argument for a practice that could also benefit the environment and our current landfill burden. As we were primarily a group of designer/makers - as opposed to materials scientists - who had limited access to technical knowledge and resources, our approach would therefore take the form of design-led upcycling.

### **The Project Stages and Outputs**

The particular knowledge that only a design researcher can bring to the process of design-led upcycling can be seen as instrumental in this practice, and was demonstrated throughout the project's three stages.

In stage one the core team worked together to generate the content for workshops for the design research team. The themes for the workshops addressed recycling through the research questions, as above, and provided a structure in which to explore the past, present and future of the appropriate ecodesign theories. The final workshop was called 'synergies' and for this session a game was developed – in the form of a digitally printed table cloth - which helped the design researchers take their ideas for recycled textile products on a reflective 'journey' through the thinking to date. The game was also tested with design professionals at an event at London Fashion Week, February 2007.

The Synergies game introduced the design researchers to the stage two sessions, which took the form of individual action and group reflection. New work was created by all of the project's design researchers and exhibited in the stage two exhibition. The exhibition also included the work of professional designers and Chelsea graduates, and intended to show range of highly creative approaches from both research and commercial practice. *Ever & Again: Experimental Recycled Textiles* (Earley 2007) focussed on showcasing new recycled textile artefacts that had been created using technologies such as digital printing, laser etching, electro-luminescence and silver electroplating. The exhibits also proposed concepts for ethical production, resurfacing / laminating, and systems and service design. A range of methods were used to gather feedback at this point: questionnaires, guided tours with question and answer sessions, discussion groups, and an invited VIP feedback day.

During stage three of the project the designers reflected on the feedback from the exhibition, and reworked their concepts using adapted co-design techniques in a further series of workshops. A theory for upcycling textiles began to be developed and disseminated, which centred on interconnected design thinking for upcycled textile design, explored through workshop scenarios with a range of external participants. Both the symposium (Earley 2008) and the final collection of (soon to be published) essays have the title *Upcycling Textiles: Adding Value Through Design*, (Earley 2010).

To date, the many artefacts produced through the project - garments, accessories, samples, and written design concepts – have been: exhibited in over 28 international exhibitions, in the UK, USA, Japan, and China; acquired for permanent collection by The Museum at the Rhode Island School of Design (RISD), and the Museum at the Fashion Institute of Technology (MFIT), New York; presented in papers at over 50 international conferences, symposia, and similar events; featured in several new books about Eco Fashion; and influential in the development of new research and enterprise projects

### **Design Contributions and Principles**

The designers used sustainable design principles combined with the reuse of materials to inspire and support textile innovation. The project gave rise to many new textiles and textile products and these - shown in an innovative exhibition context during stage two – embody a host of creative contributions. They range from the aesthetic, technical, ethical, systemic, to textiles and textile concepts that contain interconnected thinking and approaches. They represent new thinking in a whole host of ways – most notably through the application of new technologies and the reuse and elevation of low-grade materials – and include:

- Digital printing onto reclaimed fabrics
- Using recycled non PVC laminate coatings onto vintage and damaged textiles
- Using sonic equipment to slit / mark polyester shirts to reshape and embellish them
- Fusing digital dye sublimation printing with heat photogram printing and hand painting onto charity shop garments
- Reusing and relocating interior products through the use of magnets
- Using electro-luminescent paste to overprint and give new function to second-hand substrates
- Using silver electro-plating techniques to add value to co-axial cable, creating jewellery and accessories
- Offering services to the consumer for relining coats
- Offering a styling service to consumers to help them preserve and prolong the life of items in their wardrobe
- Creating a dress / service that has 4 future lives predestined
- Using plastic packaging to create coatings for second-hand textiles, creating a water / weatherproof surface for use as exterior textiles
- Using laser technology to create new surface / decoration effects, where glue, printing inks, etc would previously have been used
- In Summer 2007 the project was also the first in the UK to have ‘eco’ base cloths – organic cotton, hemp and wild silk – specially coated to make it suitable for digital printing.

The project has also made a significant conceptual contribution to the development of the design theory for upcycling textiles. The guiding principles for designers that can be derived from the outcomes of the project include:

1. The consideration for the hierarchy of recycling
2. Aesthetics and the design of upcycled textiles that are ‘better’ than the original
3. The generation of alternative and supporting actions
4. Making enlightened material choices
5. Understanding the different implications of using pre consumer and post consumer waste
6. The design for future recyclability, and if possible, future upcycling

7. The consideration of monomateriality, detachability, and the incorporation of the aging process
8. The design of textiles with zero waste
9. The design of textiles to maximise the benefits of the product
10. The consideration for scale - small is beautiful, and start local - but think global

The project has made a significant contribution to the definition, knowledge and understanding of this emerging field and practice, helping to establish 'upcycling textiles' as a new and valid field of enquiry. Before the *Worn Again* project began in late 2005, no references to 'upcycled textiles' could be found. A handful of references began to appear on the search engine [www.google.com](http://www.google.com) at the time of the project's symposium (July 2008), and referred only to that event and the *Worn Again* project. In February 2010 there were 36,900 results, and in March 2011 the search returns 62,800 results. This project, its design researchers, and the graduates of the BA / MA textile course at Chelsea, represent the majority of these hits.

### **Methodologies**

The methodologies the project employed, and later adapted and developed, were based on the need to create a framework for researchers who were by and large extremely busy course directors and senior lecturers: we scheduled one-day workshops across the year in advance; introduced a knowledge sharing system for reporting back on conferences and events attended by individuals, and archived this information, sending it out as a bundle at the year end; developed design games to play that explored the more complex ideas and theories; and used a Dictaphone and transcription service to aid the documentation and reflection process.

The stage one workshops and the 'synergies' game that was developed for the project, evolved into a workshop programme 'The TEN: Interconnected Design Thinking for Textiles' for various external and international institutions. This activity has most recently been developed for commercial consultancy work for the team.

### **Further Research**

The project recorded a significant advancement in the competence development for the design researchers involved. The end of project interviews conducted by Dr Emma Neuberg, which were written up into her 2010 essay, titled *Reflections, Insights and Collaborations*, show what a transformative project this has been for the participants: as professional designers, as researchers, and as tutors.

This has led to new research being conducted by individuals in new collaborative partnerships. For example Neuberg herself established the 'Slow Textiles Group' in 2009, and collaborated recently on the award-winning *Slow Fast* digital textile workshops at the V&A with another of the project's design researchers, Melanie Bowles. In October 2009, The Science Museum in London commissioned new work from the project team, which went on show in June 2010, *Trash Fashion: Designing Out Waste*. It is a significant achievement, as this is the only work in the entire exhibition to represent the concept of upcycling, and showcases work by more internal collaborations: Earley and Geesin; and Bowles and Round, as well as new work by the project's PhD student Kate Goldsworthy, who has formed an external collaboration with The Welding Institute (TWI) in Cambridge.

Since then more upcycled work has been created and exhibited for *ReTHINK!*, at the Audax Textile Museum in Tilberg, Holland, (September 25, 2010 until January 30, 2011). On show was project work by Vuletich and Page, and new upcycling work by Earley, Goldsworthy, and Bowles.

Other projects include:

- *Gap UK KTP Project* – (Earley, Harris and Heeley for TFRG, AHRC approved 2008). This project aimed to develop a new design and manufacturing template for Gap UK, which exploits sustainable design, recycling and localised manufacturing capabilities.
- *The SIFO Project* - From Waste to Material Resources in a Grave to Cradle Perspective: a stakeholder approach within the textile value chain. (Goldsworthy for TED, 2009 - 2011). This project aims to explore how a multi-disciplinary approach to waste reduction – including natural sciences, social sciences and cultural studies – can contribute to reducing the material flow of textiles and turn textile waste into a material resource. A project with The Swedish School of Textiles, National Academy of Arts, Oslo and the Nordic Initiative for Clean and Ethical Fashion (NICE). Funded by The Research Council of Norway / National Institute for Consumer Research.
- *Cultural Collage Project* – (O’Mahony and Politowicz, TED 2008 - 2009). This was a cross-cultural design project exploring the themes of recycling, mutli-disciplinary practice and cultural collaboration, with designers and students from the University of Technology (UTS) in Sydney, Australia, Universidad Diego Portales in Santiago, Chile and from Chelsea.

One final question emerged at the end of the project that has now become the focus for future research. It is ‘How can designers be sure they are upcycling and not just recycling?’ The suggestions for this are to be presented this spring at a conference in Copenhagen, (Earley 2011).

Further research has also been developed through iterations between research and teaching. The TED project already had a portfolio of research projects which individually explored many aspects of sustainable textiles, but *Worn Again* further developed the framework for research activity which feeds directly into the teaching programmes, giving real depth and breadth to the dissemination. It is the integration of this research practice and thinking into the curriculum for BA and MA Textiles that gives the project potential to develop models to benefit the wider research and academic communities of the future. The recent student project with Burberry illustrates this as it explored many strands of sustainable design in an interconnected, holistic, yet commercially viable context, (<http://chelseatextilestudents.blogspot.com>).

## Impact

The importance of the research outside of the university environment is a key concern for all design researchers today, and the project’s record of design and dissemination outcomes indicates that the work is already being recognised and valued outside of academia. Through the museum collections and exhibitions alone we can see that the upcycled textile work is beginning to make a cultural contribution to the dialogue around eco fashion and sustainable textiles.

This report shows that there is already some evidence that this potential has begun to be realised. For example, a team of designers from a trend prediction company (WGSN) who are at the front end of the textile production chain, attended the project’s exhibition and symposium:

*“Reflecting on the impact of the event [Symposium 2008], educator and trend prediction journalist Philippa Wagner noted the “enriched thinking at WGSN behind what upcycling can be”. She observed this as having “a direct impact on fabrics coming out from mills showcasing at the last two seasons [at the trade show] Premiere Vision”. Wagner also highlighted the “emotional aspect of sustainability” as “a key message that came from that symposium which is central to the way that we teach/forecast sustainability/responsible design now.” (Hemmings 2010)*

The project can offer initiatives like Defra - the government department for the environment, farming, and rural affairs – an input in terms of how a designer can be instrumental in projects and practices

that aim to reduce levels of material waste. Defra made the project stakeholders in its roadmap initiative ([www.defra.gov.uk](http://www.defra.gov.uk)).

Not-for-profit organisations like the Jerwood Foundation, the Fashioning an Ethical Industry project (FEI) and the Ethical Fashion Forum (EFF), all have an interest in the project outcomes, in the desire and need to better understand how designer / makers can play a key role in producing upcycled and more sustainable products. The project's theories for upcycling textiles and interconnected design thinking will be used by organisations like these to help encourage and mentor new designers and design projects that wish to reuse materials and consider sustainable design. (<http://www.ethicalfashionforum.com/excel/consultants-pool>).

In terms of mentoring new design businesses and entrepreneurs, UK organisations like Nesta and Cockpit Arts work with the next generation of designers, and the project has been used to inform sessions with two businesses. The European funded Nottingham Trent University based project, *Future Factory*, aims to offer a similar kind of support to local SME's in their area, and the outcomes from the project have already formed the basis of mentoring advice offered to such enterprises. This has most recently been extended through the work with companies connected to the Sustainable Fashion Academy in Stockholm. ([www.textileenvironmentdesign.blogspot.com](http://www.textileenvironmentdesign.blogspot.com)).

## Conclusion

*“Rather than bringing designers closer to business, bring business people closer to the radical and visionary possibilities of design.”* (Verganti 2010)

The project proposes new design theory for the practice of upcycling textiles. It also recorded a real change and progression in the thinking of the project's various design researchers. Together these factors potentially give the textile designers and the TED group range and currency of thought for the future, both within and without the textiles discipline. 'The TEN' design strategies are now being used to curate exhibitions, and structure and inform training sessions for professional designers, through consultancy projects with the Textile Futures Research Centre - one of the UAL's six research centres – with clients like the Gucci Group, VF Corporation and H&M.



Becky Earley delivering a lecture to H & M, Stockholm, 2011

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## Project Credits

*Worn Again* design research team: Rebecca Earley (PI), Professor Kay Politowicz, Lorna Bircham, Caryn Simonson, Melanie Bowles, Kathy Round, Dr Frances Geesin, Dr Emma Neuberg, Clara Vuletich, Gary Page, Kate Goldsworthy (AHRC funded PhD student), Jen Ballie (TFRC funded PhD student), Dr Kate Fletcher (stage 1) and Lucy Batchelor (research assistant, stages 1 and 2).