

# RESEARCH CIRCLES

*A collection of essays and interviews  
by researchers at Centre for Circular  
Design, University of the Arts London*

Edited by Rebecca Earley  
October 2020



**ual:** centre for  
circular design

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# About

*The Centre for Circular Design at University of the Arts London is a leading voice in academic design research and knowledge exchange. Co-Directed by Professor Rebecca Earley and Dr. Kate Goldsworthy, the team focus on using practice research approaches to steer and support emerging circular economies and communities around the globe.*

By combining academic and industry research the Centre for Circular Design (CCD) brings together UAL research and teaching staff, PhD students, national and international academic researchers, cultural institutions, industry stakeholders and commerce to create new connections. Together they explore design for circular contexts with approaches ranging from emerging technology, systems design, materials, tools, user behaviour and social innovation.

CCD have been involved in the successful delivery of European research projects including MISTRA Future Fashion and Trash-2-Cash, and are currently working on The Business of Fashion, Textiles and Technology (BFTT) project, a five-year industry-led project, which focuses on delivering sustainable innovation within the entire UK fashion and textile supply chain.

In their latest EU H2020 funded research project, Herewear, which began on 1 October 2020, the team are creating design guidelines for new bio fibres extracted from agricultural waste, to be made into circular streetwear and uniforms, through localised manufacturing contexts across Europe. The work includes: the creation of a small digital bio-materials resource; a new framing for lifecycle assessment criteria; analogue and digital guidelines and training tools; and a model for systemic materials innovation methods.

Please keep up to date with all our news via our website.  
<https://www.circulardesign.org.uk>

# Foreword

*Malcolm Quinn*

*Professor Malcolm Quinn is UAL Chair of Cultural and Political History and Associate Dean of Research at Chelsea, Camberwell and Wimbledon Colleges.*

The Centre for Circular Design (CCD) at UAL is now three years old; this publication marks that moment. In that short time, CCD has established itself as a globally connected centre for research on the circular economy, which also retains an art school attitude and ethos. The centre, under the joint direction of Professor Becky Earley and Dr Kate Goldsworthy, has had a long gestation from the Textiles Environment Design (TED) research project established at Chelsea College of Arts more than twenty years ago, through Professor Earley's leadership of the Textiles Futures Research Centre at UAL and on to the establishment of the Centre for Circular Design, in the context of the formation of a new School of Design at Camberwell Chelsea and Wimbledon Colleges of Arts.

When the Centre for Circular Design was launched in 2017, it initiated a step change in circular design thinking within UAL and beyond. The precise nature of this change is defined by Kay Politowicz in an interview with Becky Earley in this collection, when Politowicz refers to the manner in which creative individuals imagine the world as it could be, through introducing material changes into the world as it currently exists.

As an example of this, she cites a conversation with Swedish papermakers, in which she asked them to make paper with the qualities of cashmere. This posed the question "what then do we have to sacrifice and achieve in the papermaking world to get the qualities that we're feeling here?" It is this approach to initiating a dialogue grounded in materiality, making and use, that has enabled CCD to radicalize the role of the designer within circular economies, moving from a position in which the designer is someone who puts an aesthetic gloss on the products of industry, to a position where the designer has a central role in shaping the industries and the economies of the future, using a tripartite model that addresses materials, models and mindsets.

The last of these, 'mindsets', is the most challenging, because it positions design as a critique of ideology, in other words, an attempt to alter the social conditions that make it seem 'natural' for us to make clothes that can't be disassembled for recycling, to burn wool rather than find a way to use it, or assume that repairing is not a creative thing to do. This may seem too large a challenge for a designer to take on, but CCD has shown us that all the things that make our current economies seem normal and a circular economy unfeasible, are rooted in a myriad of concrete decisions and choices by consumers, scientists, politicians and managers that construct this normality as our common everyday reality.

CCD have shown how we can intervene within the warp and weft of all these decisions to build a circular economy through material interventions. In one sense, this project harks back to the design reform approach used by Henry Cole and Richard Redgrave in nineteenth-century Britain, which sought to analyse the intelligible relations of production and consumption through design, and unite the art school, the museum, the factory and the home using a common language. In another sense, however, CCD use design to intervene within the world that these relations of production and consumption have built over the past two hundred years and construct an alternative that will ensure our survival.



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# Introduction

## *Leading with Kindness*

Rebecca Earley

*Professor Rebecca Earley is UAL Chair of Sustainable Fashion Textile Design. She is co-founder and co-director of Centre for Circular Design with Dr. Kate Goldsworthy. From 1996-2017 she was lead researcher at the Textiles Environment Design unit at Chelsea College of Arts. Between 2010-2017 she was director of the UAL's Textile Futures Research Centre, based at Central Saint Martins.*

On 11 March 2020 a group of researchers from CCD made their way across London to my home in Chiswick. We were planning to workshop the ideas for this book, as well as celebrate my 50th birthday with a 'pot luck' lunch. Ripples of concern ran through the group that day – we were beginning to understand that Covid-19 was about to bring our normal working lives to an abrupt halt. (Kay Politowicz, always way ahead of the curve, had traveled across London by tube, already wearing a face mask, gloves and carrying hand sanitiser).

It was the last time I saw anyone from the centre face-to-face. Today, 11 October 2020, exactly seven months later, the pandemic has claimed too many lives, and our design, research and teaching practices have changed almost beyond recognition.

This book was originally about celebrating the people and projects that have been active at the centre since it was officially founded in October 2017. In the end, it became much more than this; it became a way for us to stay connected and to support each other through lockdown and the strange, enforced distance of only seeing each other on a screen.

**“Making a commitment to kindness within an organisation ensures that it is people-centred. Attention and resources are given to ensuring that each member of the team is supported, challenged and encouraged in order to reach their full potential.” (Turner 2018)**

During my time leading research projects and directing research centres at UAL, I have developed an approach which has kindness at its core. When working with a range of creative researchers one has to appreciate that ideas are precious, and creators feel vulnerable. Academia can be hard for many designers, as review processes can sometimes be unsupportive and occasionally seem overly-critical. Budding shoots can easily be shot down.

I have written about research centre leadership and 'wholeness' for circular design (Earley 2018) but I have also found a recent report by the Carnegie UK Trust about the Kindness Innovation Network which really resonates with my approach (Ferguson & Thurman, 2019). It outlines how leading with kindness can work in practice:

- Protecting time and creating spaces for people to come together
- Listening to people's needs and finding solutions in the round, not just addressing our bit of the picture
- Creating opportunities to recognise and celebrate kindness
- Challenging unkindness... radically rethinking our future systems to be more holistic / people centred and inclusive

### **SUDDENLY, REMOTE WORKING**

I like to physically work shoulder-to-shoulder with people. My interests and approach as a designer have changed in recent years, as it has become increasingly clear that sustainable and circular design needs collaboration and communication on a scale never executed before. This is hard to do on MS Teams.\* (\*insert your most relevant, reliable alternatives here - Zoom, Google Hangout, Skype, etc...)



*Circular Transitions Conference, Tate Britain (November 2016) – bringing together a community of researchers around circular design research, in partnership with Mistra Future Fashion and co-facilitated by Phil Hadridge.*

We are lucky to have these digital communication platforms, (would we have been able to offer teaching by telephone if this pandemic had happened 10 years ago?!), but my experience of working on design research challenges for circular economies of the future is that it is a complex, systemically-driven activity at the best of times. In pandemic times, it has become crucial to maintain and support our activities in new ways; on top of nurturing the connections to our existing team, we have also had to build new relationships with research funding application partners too.

I took this on as a specific focus in May and June 2020. Drawing on my leadership experience, tools and methods I set about creating an online space for the researchers to come together and bring our ideas alive. The natural progression was to find new ways of reaching out to ever more diverse audiences; I set up a makeshift film studio in my garden studio to create YouTube tutorials for the back-catalogue of CCD circular design tools; we researched and experimented with online platforms, and developed new methods of online workshop delivery. The CCD team rallied behind this idea with creativity and enthusiasm

to adapt and innovate. We have been supported in working this way for a long time by the brilliant Phil Hadridge and I was really pleased when he agreed to be interviewed for this book (Zoom Circles, p.108).

### **EVOLVING COLLABORATIONS AND PARTNERSHIPS**

The centre was founded to enable a group of researchers to focus on a new direction together; circular design. In co-directing the centre, the ambition had always been to curate a group that explored the widest interpretation of the theme. Previous research – like the AHRC-funded projects 5ways; Worn Again: Rethinking Recycled Textiles; and FIRE Up – had explored sustainable design, recycling and industry contexts and had concluded with insights that pointed towards the important role of design and materials in creating systemic, circular change. Kay, Kate and I could see that The TEN could be reshuffled so that design for cyclability became our main approach, with the other nine sustainable design strategies being built into and around these new circular contexts (Earley *et al.* 2016).



TED's The TEN, strategy number 2, Design for Cyclability became the 'lead card' in CCD's design research approach, with the other nine sustainable design strategies still being key.



CCD researchers developing new project ideas, shoulder-to-shoulder, at the summer away day, Richmond (July 2019).



Laetitia Forst's PhD Textile Design for Disassembly samples being used in a session with students at TABA, Chelsea (2018).

It was the Mistra Future Fashion programme that gave us the opportunity to test these ideas further, over a considerable time period (2011–2019). Clara Vuletich's work was one of a few PhD projects to come from this innovative research programme (TED to TEDx, p.104). More recently, the industry research project at Filippa K with Elin Larsson (Circular Design Speeds, p.114) enabled us to test ideas right through to the market place (and even the V&A Museums in London and Dundee (Jen Balllie, Sewing Box for the Future, p.118)). Kay Kate and I, aided by CCD research assistants, worked with material and social science partners through processes that were centred on prototyping products and hands-on making (Rebecca Earley, Service Shirt, p.14; Kay, Politowicz, Prototypes for Collaboration, p.24; Helen Paine, Joining the Dots, p.38).

The EU H2020 Trash-2-Cash project was very much about making this approach into a formal methodology – called 'Design-Driven Material Innovation'. Understanding more about the way we make, work and communicate with circular materials is a key strength of ours at the centre, supported and articulated by researchers who aren't designers themselves, but instead help us uncover the myriad of theoretical, social and human circles that align with our work (Rosie Hornbuckle, Translational Design Research, p.32; Lucy Norris, Anthropology and Circular Design, p.96; Marion Real, Local, Redistributed and Convivial Narratives, p.100).

Our current activities include the British Fashion and Textiles Technology (BFTT) project (2019–2023), an AHRC Creative Cluster award, for which Kate Goldsworthy is Deputy Director. She is using her extensive circular material and systems knowledge (Emergent Themes, p.18) to explore the future of circular synthetics with UK businesses, and in the process bringing new team members and perspectives into CCD (Kate Wakeling, Track and Trace, p.42).

### PHD RESEARCH AND TEACHING

Without doubt, one of the high point of my job as co-director is supporting and mentoring the PhD researchers. They are like intrepid explorers – bravely going where no woman has gone before – and they make excellent travel companions. They are energetic and adventurous, and in the last three years have teamed up on many occasions to deliver super-insightful CCD events and projects. Their contributions to the book focus on their own particular research questions, and give a good sense of the breadth of thinking that the field of circular design is challenging us to undertake. (Laetitia Forst, Textile Design for Disassembly, p.48; Cathryn Hall, A New Way to Play, p.52; Emmeline Child, What is Fallout Fashion? p.56; Sanne Visser, Hair and Now, p.60).



Becky Earley (left) working with design staff at Filippa K, Stockholm, during the Circular Design Speeds project, Mistra Future Fashion programme (June 2017).



Kate Goldsworthy (left) working with material scientists during a Trash-2-Cash project workshop at Chelsea (November 2016).



Sharing knowledge and methods with students and staff across the UAL colleges and beyond, TABA, Chelsea (2018).



Sharing knowledge and methods with students across the UAL colleges, Circular Design Lab, Chelsea (2019).



Global Change Awards, Stockholm, with (left to right) William McDonough (Cradle-to-Cradle), Becky Earley (Moderator); Erik Bang (H&M Foundation) (April 2019).

All CCD researchers are generous and committed, but special mention must go to Laetitia Forst and Cathryn Hall who tirelessly delivered the There and Back Again (TABA) event series, now beginning its fourth year. They have brought new audiences to the centre and have extended our reach into the CCW Design School curricula. They also pioneered the CCD Circular Design Lab – a ‘sell-out’ teaching series – which includes taking forward my Circular Surgeries format for students who have burning questions about circular design that need addressing in 1:1 tutorial sessions.

CCD researchers make regular contributions to the MA Textile Design course at Chelsea, headed up by Jane Murrow. This book contains three picture essays by 2019 graduates who all took part in my Know Thyself upcycling shirt masterclass project. The graduates wrote about their practice research ideas – ranging from the plight of wool (Fiona Daly, *Wool Journeys 2020*, p.82), to the problem of disposable wet wipes (Kath Lovett, *Wipe-Away*, p.86), to indigo dyeing, old clothes and memory (Emma McGinn, *Ever-Me, Ever-Us*, p.90).

New conversations with staff and students across the Design School have resulted in Associate Researchers joining the centre. They bring different methods and meaning to our circular material thinking – asking timely questions around politics, values, use, systems and flows (David Cross, *Geometry and Revolution*, p.66; Maiko Tsutsumi, *Designer Maker Mindsets*, p.70; Bridget Harvey, *Repair, Care & Politics*, p.76).

## KNOWLEDGE EXCHANGE

It’s been a busy and exciting three years for CCD researchers – the field of circular design and circular economy research has expanded rapidly in a very short space of time. This is good news. We are grateful to all our CCD partners and collaborators who have enabled us to put our ideas into practice. These include the Global Change Award, H&M Foundation, Sweden; the British Council; and John Lewis. I have taken this idea of kindness through into these projects too; I have learned that designers in industry experience the same vulnerabilities as our academic research team, and that this approach always produces strong results in our work with them (Baker & O’Malley *et al.* 2008).

On 8 October 2020 CCD helped launch World Circular Textiles Day 2050 with Cyndi Rhoades of Worn Again Technologies and Gwen Cunningham from Circle Economy in Amsterdam. Kate Goldsworthy and I are co-founders of this new collective – which brought over 90 businesses, industry leaders and NGOs together as Founding Signatories. We are looking forward to the diversity of inclusive roadmaps we will produce, which are aimed at achieving real circular economies by 2050 (*Moving Mountains*, p.124).

Like many at UAL, I feel a burning desire to go further to address equality and diversity issues through our research, teaching and knowledge exchange work. I see doing this through the World Circular Textiles Day collaborations; working on visions for 2050 with students and staff, using circular design to co-create and figure out the way to make change happen. We all need to strive for a more equitable and just society; UAL researchers and educators are decolonising the curriculum and writing new projects that use design research to ensure #blacklivesmatter.



Service Shirt (Earley 2018), a fifty-year fashion concept created for the Circular Design Speeds project, Mistra Future Fashion programme, Sweden.

## CONCLUSION

I'm so proud of what we have achieved at CCD over the last three years, but while the projects and the outcomes have been amazing to bring to fruition, it is the atmosphere of kindness and openness I hoped to create at the centre which I hold as one of our greatest achievements. I wholeheartedly believe that this approach is the bedrock of CCD and has been a catalyst for the rich range of ideas and results presented in this book. Over the last seven months, we have been with our families more, home life and work have merged, and our needs as employees, employers and collaborators have changed. Environmental issues have moved swiftly up the agenda in many organisations. Huge challenges lie ahead for us all. We will all need to know how to be kind and I urge others to take up this mantle in academic research and beyond.

## Notes

Michael O'Malley, William F. Baker et al., *Leading with Kindness: How Good People Consistently Get Superior Results* (Nashville: Thomas Nelson, Harper Collins, 2000).

Rebecca Earley, 'Whole Circles: A leadership model to support expanded roles for circular textile designers,' *The Journal of Textile Design Research and Practice*. 6:1 (2018): 112-136, 6:1, 112-136, DOI: 10.1080/20511787.2018.1434744.

Rebecca Earley, Clara Vuletich, Kate Goldsworthy, Kay Politowicz, Miriam Ribul, *The Textile Toolbox: New design thinking, materials & processes for sustainable fashion textiles*, Design Report, Mistra Future Fashion, Research Institutes of Sweden (RISE). See <http://www.textiletoolbox.com/research-writing/mistra-textile-toolbox-report-20112015>.

Zoe Ferguson and Ben Thurman, *The Practice of Kindness: Learning from the Kindness Innovation Network and North Ayrshire* (Dunfermline: Carnegie UK Trust, 2019).

Kathleen Turner, *Kindness in Leadership: Making an Organisational Commitment*. Provocation paper 2017-2018, Clore Leadership. See <https://www.cloreadership.org/resources/kindness-leadershipmaking-organisational-commitment>.



'Circular Economy Models' panel for the British Council in Greece, with (left to right) Becky Earley (Event Co-curator); Edwina Ehrman (V&A Museum), Joe Iles (Ellen MacArthur Foundation); Vicki Moudilou (Eating the Goober, Greece); and Zoe Broach (Royal College of Art, London). (Athens, February 2020).

## Project Links

Herewear (2020-2024), <https://cordis.europa.eu/project/id/101000632>.

BFTT (2019-2023), <https://bftt.org.uk>.

Trash-2-Cash project (2015-18), <https://www.trash2cashproject.eu>.

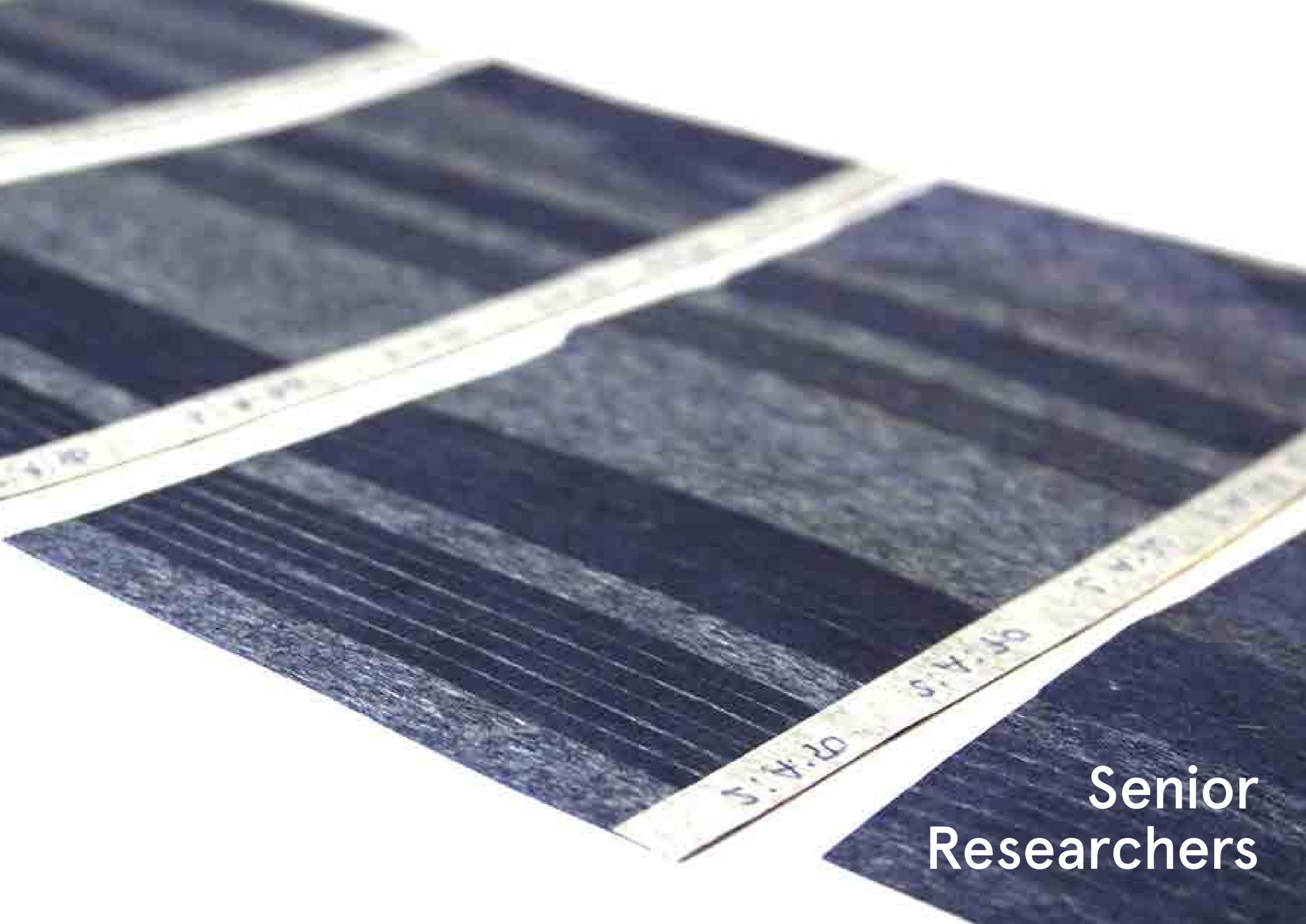
FIRE Up project (2013-4), <https://www.sustainable-fashion.com/fire>.

Mistra Future Fashion programme (2011-19), <http://mistrafuturefashion.com>.

Shirt Stories (2019) UAL Professorial Platform lecture, [https://www.youtube.com/watch?v=x\\_sCgeeNh7A](https://www.youtube.com/watch?v=x_sCgeeNh7A).

Worn Again: Rethinking Recycled Textiles project (2005-9), <http://52.71.27.166/research/research-projects/completed-projects/worn-again>.

5ways project (2002-3), <https://www.circulardesign.org.uk/about>.



Senior  
Researchers

# Emergent Themes

Kate Goldsworthy

Dr. Kate Goldsworthy is co-director and co-founder of Centre for Circular Design. Her research is focused on 'how design can accelerate the journey towards full-circularity of textile materials' and her methods are practice based and transdisciplinary. She is also Deputy Director of the Business of Fashion Textiles and Technology partnership at UAL.

In 2005 the idea of a connected materials ecology seemed far-fetched at best but the emergence of a commercial fibre-to-fibre recycling technology changed everything.

It's fifteen years since Teijin's innovation was set to rock the textile world and whilst they failed to implement their technology at scale, full-circularity is finally beginning to feel achievable. The efforts of companies and researchers worldwide looking at alternative methods for chemical recovery of fibres are making giant leaps forward and our upcoming report on 'a roadmap for circular synthetics' illustrates the enormous effort being made to bring these technologies to the market<sup>1</sup>.

The Teijin innovation came at the very start of my PhD and completely changed my focus. It brought hope of a step-change in the way we produced and perceived recycled textiles, not as inferior downcycled materials but as regenerative and continuous resources and flipped my practice from a focus on 'using' recycled materials to one of 'preparing' them for recycling in the future.

The research was funded through the AHRC 'Worn Again' project which aimed to 'rethink recycled textiles' through practice research – the first of its kind and the foundation for the next 15 years of research at CCD. The practice element of my PhD was a series of new manufacturing and finishing techniques developed with a laser-technology that could be used to produce and embellish polyester textiles (which already dominated in the global fibre supply chain) without any barriers to forward recycling<sup>2</sup>.

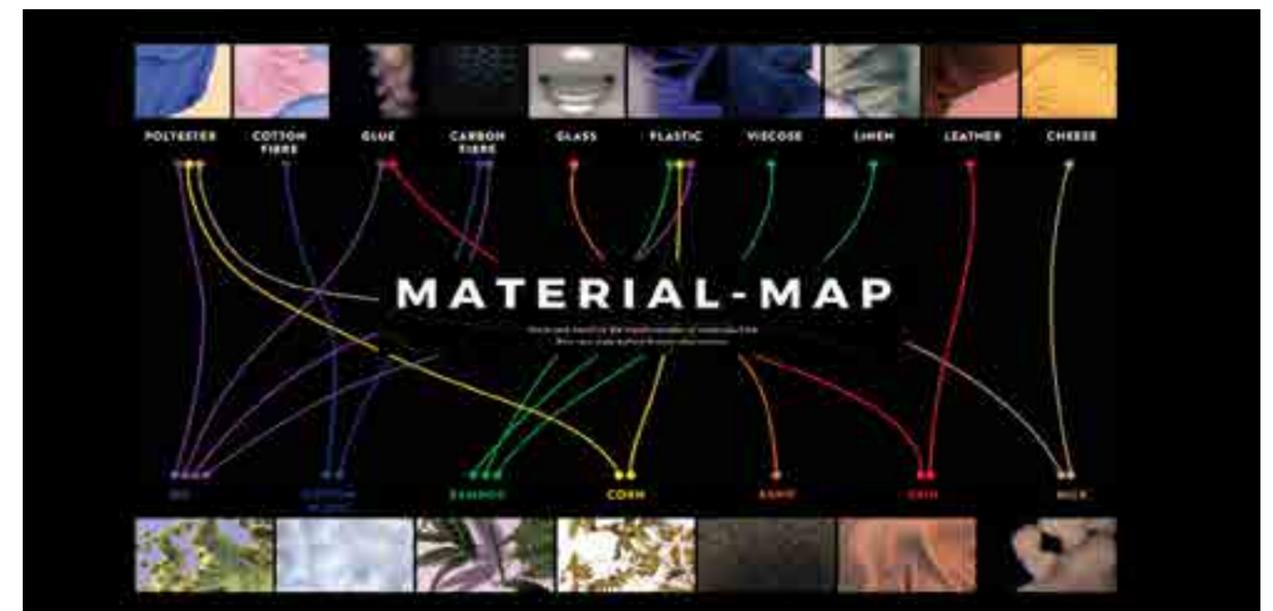
Today, it has never felt more important to stop these precious materials ending up in landfill.

By 2025 it is predicted that we will produce 90.5 million tonnes of polyester annually and that more than 93% of future fibre production will be polyester<sup>3</sup>.

I should emphasise that this isn't only a fashion industry issue. Polyester fibre is prevalent in every modern industry from agriculture, aerospace, mobility, infrastructure, communications and healthcare to name just a few. The idea of being able to remove it from our material world (especially a post-Covid one) is inconceivable and on many levels not desirable. However, in order to move forward in a sustainable way we must shift mindsets to respect this valuable resource (which is already 2 million years old before we begin to work with it) and retain its enormous value for future generations.

Chemical recovery technologies are poised to launch us into the next materials revolution, and in the process reinvent synthetic materials as the ultimate 'renewable resources' of the future.

This recycling revolution along with other emergent technologies in tracking and tracing of materials point to some phenomenal shifts towards transparency and circularity in the future. Companies like Oritain<sup>4</sup> can trace raw materials back to the geographical origin within a few square miles; waste-streams are becoming feasible material resources due to the development of automated fibre recognition systems such as Fibresort<sup>5</sup>; Reverse Resources<sup>6</sup> are identifying and bringing focus to pre-consumer waste-streams not yet counted in our already



Material journeys mapped from raw materials through to textile type in relation to processing routes. The project resulted in an online animated tool to explore each material through the lens of animal, vegetable or mineral starting points.

shocking waste figures; these technologies along with the incredible innovations that create fibres from non-textile waste-streams (Orange Fibre, Vegea, Pinatex to name just a few)<sup>7</sup> are set to propel us into the next material era.

## RE-ACTIVE, PRO-ACTIVE AND CONNECTED DESIGN APPROACHES

From my PhD research I published a set of models<sup>8</sup>, which explored the varied design approaches for circularity from a now, near and future perspective. At the time we were very much in the 'now' and beginning to move towards closing the loop on materials. I never imagined we would be considering the joining of these loops into a connected 'materials ecology' for many years. However, during the time I have spent working with the brilliant team of researchers and students at CCD, I have seen our design approaches, and the expectations we hold for the design field as a whole, expand and shift in the most incredible ways.

Design approaches have shifted dramatically from purely end-of-life considerations to a more holistic and connected set of actions at every point in a material's life cycle.

What has stayed constant for me is the belief that it all starts with an understanding of the objects and

materials around us as ever-changing, dynamic and never static. With this perspective there is no way to ignore the responsibility of all actors in that material journey<sup>9</sup> to map its path and define its value; to understand its impact and the relationship between a material and the people involved in its making and using.

As we move away from our linear models of making and consumption towards more circular and connected ones our relationship with materials will change. How we understand, and design products, not as static objects but as dynamic and evolving systems is key to this more sustainable future<sup>10</sup>.

This approach is core to the concept of circularity. Designers can imbue waste materials with new life and value through creative acts of transformation. At its most straight-forward we identify material waste streams and recreate or embellish them as new products (a reactive approach). At CCD we have developed and continue to develop projects in this way – with an ever-more informed understanding of the part of the lifecycle they inhabit and the wider impacts of our interventions. But often this is now coupled with a more proactive approach – bringing EOL considerations into the very start of the design process.



Finishing techniques developed as part of the Mistra Future Fashion 'Circular Design Speeds' project. Featuring a process developed originally for the surface embellishment of polyester fabrics during my PhD alongside other bio-compatible treatments.

In 2008 Becky Earley and I collaborated on Twice Upcycled<sup>11</sup>, which combined her research into models for polyester shirt remanufacture through fashion textile design and innovative heat photogram printing with my laser-quilting process, which we used to create a third-life proposition. During both recycling phases we kept the final destination (chemical recovery) in mind and ensured no added materials were used which might hamper future cycles. We were starting to understand how design could 'prepare' materials for multiple life cycles whilst maximising their longevity in each product cycle, the first of many CCD collaborations which continue to bring new layers of discovery. The sum is always more than the part.

Many of our PhD students<sup>12</sup> have focused on very particular challenges and opportunities in the creation of circular economies; Cathryn Hall is redesigning the mechanical recycling process and blending for maximum future value; Loula Mercedes is working with agricultural waste from the coffee industry in Columbia; Emmeline Child has developed scalable remanufacturing proposals for branded goods; Laetitia Forst has defined 'design for disassembly' specifically for textiles for the first time; Miriam Ribul experimented with materials in the earliest stages of their recovery process to create circular textiles from regenerated cellulose. All using design and creativity within a specific part of the material life cycle to affect change.

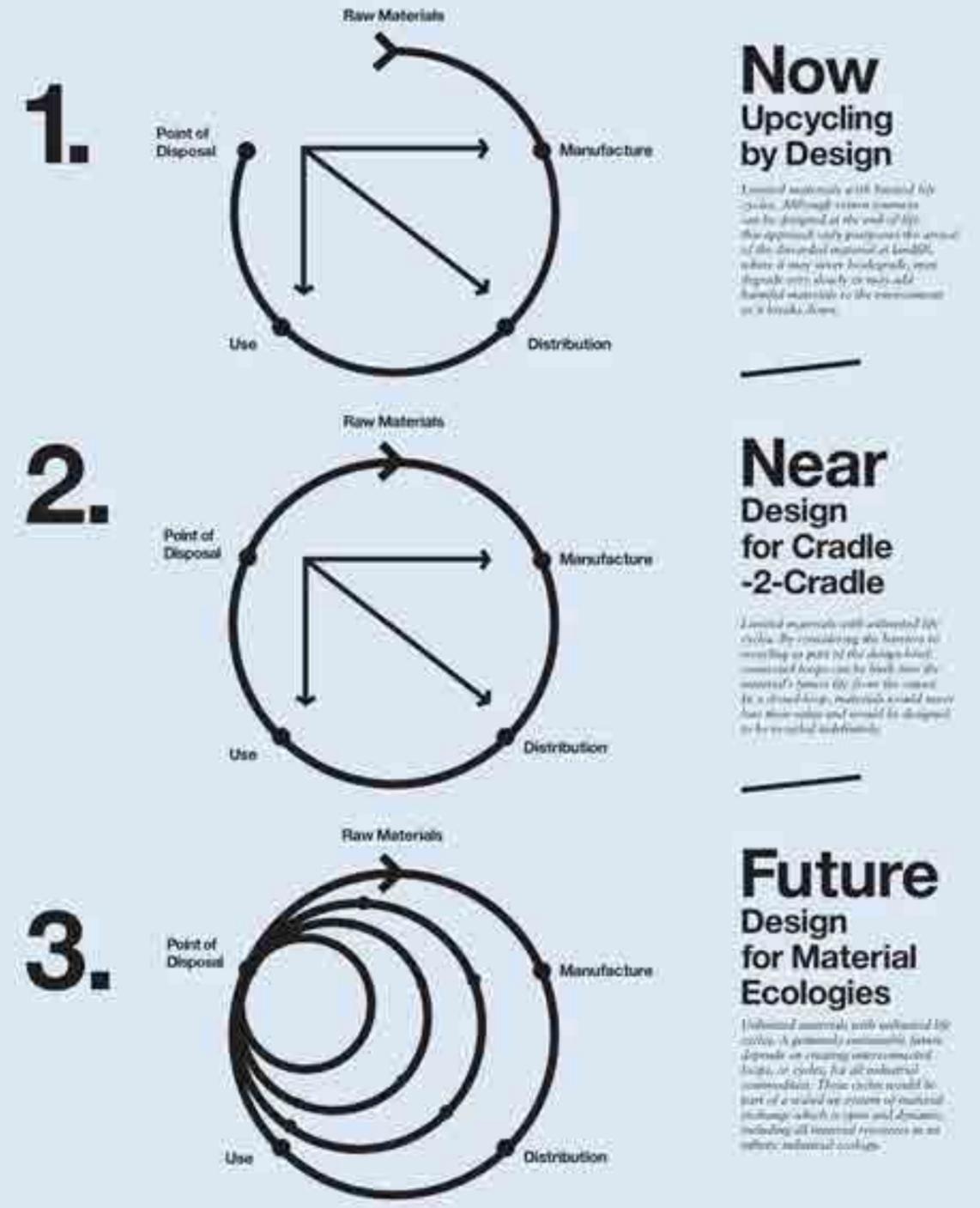
### TRANSDISCIPLINARY AND INTEGRATED LIFE CYCLE DESIGN APPROACHES

As our projects have become more and more collaborative we find ourselves adopting new designerly roles as part of an expanded team of stakeholders from every part of the value chain. By exploring this new perspective through several large consortium projects with science partners (Mistra Future Fashion and Trash-2-Cash<sup>13</sup>) we began to understand how design could contribute not only in defining circular product journeys but also in improving sustainability at every stage of its life cycle.

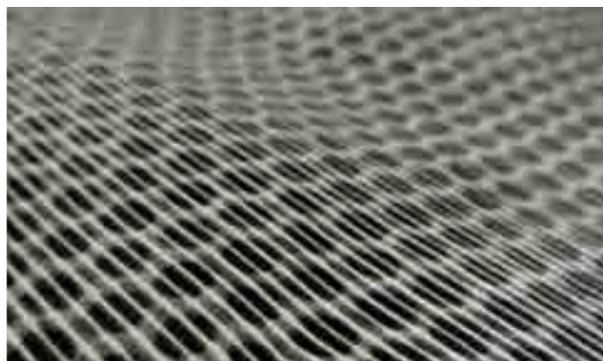
The need to find ways to work with different stakeholders from outside of design is essential for a truly systemic view.

In our MFF project Circular Design Speeds<sup>14</sup>, Kay and I worked with material scientists from Sweden to develop new circular and bio-based nonwoven textiles for the 'Fast Forward' concept. Becky explored the human systems underpinning production and use to understand the complexity of a fifty-year proposition 'Service Shirt', which included 'Service Jacket' by Laetitia Forst and textile jewellery by Chelsea graduate Katherine Wardropper. As we developed concepts and prototypes

## Towards a Zero Waste Future: Creating Closed Loop Systems by Dr Kate Goldworthy



Mapping Circular Design approaches, now, near and future for my PhD thesis. Graphics: Laura Gordon, Franklin Till, 2012.



The 'Laser Line T' was produced from 100% RPET nonwoven textiles using laser processing to cut and construct the garment pieces as well as to laminate and embellish the textile.

with our partners we simultaneously needed to design tools and new methods to facilitate our collaborations. I focused on circular co-design tools with Dawn Ellams<sup>15</sup>, and testing methods to integrate life cycle analysis (LCA) into an iterative and collaborative design process, 'qualitative design'<sup>16</sup>. By combining design and environmental science data we could simultaneously check our decisions and respond in real time with improvements we had identified through the modelling.

## CIRCULAR INDUSTRIES AND ENGAGED RESEARCH PARTNERSHIPS

The really exciting development in our work over the last few years has been through our engagement in industry through embedded research and knowledge exchange. Working in this way has often accelerated understanding and simultaneously sense-checked our hypotheses as part of the process. There's no time to luxuriate in the safe spaces of academia with the pressing challenges we face. Our in-depth 'designers in residence' project, with Filippa K in Sweden<sup>17</sup> resulted in the co-creation of a new concept garment to the market which was also collected by the V&A Museum for their permanent collection.

This was validation that our research could make a direct impact in the industry and a pivotal moment in directing future research.

We are currently working on a new set of industry R&D projects through the Business of Fashion Textiles and Technology partnership<sup>18</sup>, which are further embedding circular design principles in a range of sectors, to scale up and accelerate change. From circular materials and finishing developments with Ananas Anam's pineapple fibre 'Pinatex' to the creation of London's first circular denim lab with Black Horse Lane Ateliers, and Segura System's new sustainable supplier marketplace, we are able to develop research with a much closer relationship to the needs and realities of the market.

The real power in all the technology innovations and research projects I have mentioned, will be in their coming together, and our recent launching of World Circular Textiles Day<sup>19</sup> with Worn Again Technologies and Circle Economy looks forward to a time when they do and seeks to stimulate the process right now; we imagine a fully circular textiles industry in 2050 and invite everyone to contribute to making it happening with joint action and shared vision. Please join us!



In the Trash-2-Cash research project we developed co-design tools based on the product lifecycle map. Hearing voices from around the circular system was a powerful way to reality check our design propositions throughout the development process.

## Notes

1 Kate Goldworthy and Rosie Hornbuckle, *Circular Synthetics Roadmap*, project report, Business of Fashion Textiles and Technology (BFTT). See [www.bftt.org.uk](http://www.bftt.org.uk) (forthcoming, 2021).

2 Kate Goldworthy, 'Laser-finishing: a new process for designing recyclability in synthetic textiles,' (PhD thesis, University of the Arts London, 2012). See <http://ualresearchonline.arts.ac.uk/11638>.

3 Information from a Quartz report on polyester with reference to Tecnon Orbichem research, Marc Bain, 'If your clothes aren't already made of plastic they will be' 2015. <https://qz.com/414223/if-your-clothes-arent-already-made-out-of-plastic-they-will-be>.

4 <https://orbitain.com>.

5 <https://www.circle-economy.com/programmes/textiles/fibersort>.

6 <https://reverseresources.net>.

7 <http://orangefiber.it/en/>; <https://www.vegeacompany.com/>; <https://www.ananas-anam.com>.

8 Kate Goldworthy, 'Design for Cyclability: pro-active approaches for maximising material recovery,' *Making Futures Journal*, vol 3. <http://makingfutures.plymouthart.ac.uk/journalvol3/index.html>.

9 This was a project funded by the Arts Council to explore the complex relationship between raw materials, processes and textiles in collaboration with Franklin Till. See <http://www.animalvegetablemineral.co.uk>.

10 Kate Goldworthy, 'Afterlife: Designing the End at the Beginning,' *Viewpoint Magazine*, vol.42, (2018).

11 The Twice Upcycled project was part of Becky's long running TOP 100 project. See <http://www.upcyclingtextiles.net>.

12 All the CCD research projects mentioned in this article are available to view at: <https://www.circulardesign.org.uk>.

13 For more information see <http://mistrafuturefashion.com> and <https://www.trash2cashproject.eu>.

14 The Circular Design Speeds project (2015-2019). See <https://www.circulardesignspeeds.com>.

15 Kate Goldworthy & Dawn Ellam, D, (2019). 'Collaborative Circular Design. Incorporating Life Cycle Thinking into an Interdisciplinary Design Process,' *The Design Journal*, no.22:sup1 (2019):1041-1055.

16 The 'quantified design' method was first developed collaboratively with environmental scientists during MFF and published in the paper 'Towards a Quantified Design Process: Bridging Design and Life Cycle Assessment' (2017). <http://ualresearchonline.arts.ac.uk/11635>.

17 The Filippa K engaged research project report can be downloaded here <http://mistrafuturefashion.com/wp-content/uploads/2019/10/R-Earley.-circular-design-researchers-in-residence.-Mistra-future-fashion-report.pdf>.

18 For more information see: <https://bftt.org.uk>.

19 <https://worldcirculartextilesday.com>.

# Prototypes for Collaboration:

## *Practice Research, Textile Design, Sustainability, Making*

### *An Interview with Kay Politowicz*

*Professor Kay Politowicz co-founded Textiles Environment Design and has worked at Centre for Circular Design since its inception. Through her co-development of The TEN design strategies, a tool to overcome barriers to sustainability, she advocates a broad, interconnected view of design. As Emeritus Professor, she contributes to prototype developments as practical research outcomes for academic and industry projects.*

**BECKY:** Within the two discourses of design research and practice research in textiles, and the development of the sustainability discourse and global agenda, you've been working as a textile designer developing new materials and prototypes – would you tell us about these?

**KAY:** Yes. Recently, I was reading an interview. Stewart Brand interviewed Brian Eno. It took place a long time ago and he was being asked about the position of an artist or a designer, musician, artist, everything that he is. He said, in his experience, you can ask any scientist, and they'll always say they're driven by a wish to understand the world and how it works. Their work is all about that.

If you ask any artist, there's never a consensus about why they do what they do. In a way, it's because they're concentrating on another version of the world, the version of what it could be. Really what they're saying is, "I'll just make this piece to see what the world would be like with that in it. What would I feel or what would you feel if the world were more like this?" I thought that was a very good summary of how I feel about making work.

*I'm driven by the idea that I want to make something that embodies a change, however small the change or however large, preferably large in some of the projects we've been involved with. Making is intimately tied to researching.*

Sometimes, it's problem solving, but not always. It's not always a solution looking for a problem either. I come back to that idea of Brian Eno's: "Let's try this on for size and see how it makes me feel and see how it makes other people feel." I think that's the simple version of how I think about work and what we're doing.

Practitioners need deep experience of a limited practice of materials and processes – and they've chosen the limit. I think this enables them to come from a well-informed starting point. Then to have a dialogue with other makers enables empathy through a variety of approaches.

That's why a research group is so important, and not just a collection of individuals operating from a similar position. At some points in our history, we've utilised the idea of a group and brilliantly. We've found ways to collaborate with different perspectives, I think.

A designer, with some specialist knowledge, who can collaborate with others on a real and meaningful basis is an invaluable asset to any kind of research activity. It's always a difficult one, to say how limited one should be to a particular position, and how far an individual needs experience in a wide variety of things. It's a bit like how local is local? We don't differ particularly on that – I just think it's the collaborative potential of a disparate group of individuals that makes for a good research position.



*Pulpit paper fabric sample (\*see notes) dyed with turmeric, was created through the collaboration of Hjalmar Granberg, Rise/ Innventia AB and Kay Politowicz, UAL.*

**BECKY:** Do you think that there's a limit to this transdisciplinarity?

**KAY:** I think it's important for designers to understand how we can promote our ideas, and yet be open to, if you like, the scientific method, which is the critical discourse of testing. It results in the accommodation of what we then know to be true in order to modify the theory to avoid a kind of ideology. Design has to include the individual maker who doesn't want to be bothered, right through to the people who are promoting theories that sometimes seem unrealistic in terms of what's possible in production at scale. We could be considered to be those people.

**BECKY:** That's helpful to almost see that we have all of those extremes, all of those states, and that we're opting for understanding each other and viewing each other's different contributions, but also finding this place where the making, and the expression, and the articulation, and the interaction will meet in the sweetest spot. That's where we have found the exchange of ideas and the development of ideas to be the most fruitful.

**KAY:** I and the people I'm working with, are trying to keep ourselves grounded in the making and because

we're in an institution where all this is represented and valued. Making has been key to the definition of Art Schools. I think it's important that we add language to put what we're doing into words. I've found that when you express what you are making in words, you find out what you're really thinking. Words are critical to your experience and even to what you think. If good ideas are not clear visually or in words, they're not accessible to be shared with people. I found this quite late in my career. I now think that, rather than waiting for people to find out what you're doing if you believe it's worth something, it's important actually to explain it to people. It falls on us in research to talk on behalf of those practitioners who don't want to talk, as well.

**BECKY:** Could you talk a bit more about how you've worked with prototypes with the Mistra Future Fashion scientists? How you found the prototype has performed a role for you as a researcher?

**KAY:** We found that, as designers, our role was not necessarily well understood at the outset by the other disciplines. In other words, the thinking was that technology had to come first and the design could be something grafted on to make it palatable,

or convincing, or financially viable. Of course, we did not go in with that intention and we had to change the perception. It took time, but I think I can say that that as we worked together, through the years, it became much more accepted that design would be equal partners at the table from the outset.

**It was a very good experience. The actual production of material and product prototypes - because we did both - were key, I think, to the scientists and the other disciplines' understanding our position. Also, in seeing what could be achieved if we collaborated.**

My particular part within the project developed strongly towards the idea of collaborating with paper technology and looking for ways in which there could be a wearable paper, whatever that meant. To me that was the interesting challenge - to develop a wearable paper that would be acceptable and attractive to people currently consuming fashion unsustainably. It would have to be significant in the way that it enabled savings in the production and

in the use and in the disposal and in the cost. It would have to be what people wanted and not simply one of those things that we were talking about earlier - just the indulgence of a theory. I think we did get some of the way to it, certainly. The evidence is there for people to see if they want to look. But as much as anything, I think the prototype enabled some new evaluation of what could be one solution to a problem already identified as intractable in sustainability and fashion.

That kind of approach for me is why prototypes communicate. They enable the designer to see what they're doing. They enable partners who are collaborating to see what you're all doing. In other words, you can cut across the language of different disciplines by being united in a common goal. It goes a long way towards a viable contribution.

In fact, I would think the only way to cut across disciplines is to do that. I would say it helps you all understand, but more importantly than all that, it actually says, again, "We want to make something to embody the change we want to see and then we can all decide what we feel about it."



*Pulpit paper fabric sample (\*see notes) with OganoClick water resistant finish, created in through the collaboration of Hjalmar Granberg, Rise/ Innventia AB and Kay Politowicz, UAL.*



*'Paper Leather': 99% paper pulp, unbleached & unrefined (Rise/Innventia AB, Sweden) Natural Dyes logwood & cochineal applied to finished material. Softened by repeated hand-rolling in transverse directions to emulate worn leather. (UAL). Garment constructed using cellulose adhesive developed at VTT, Finland) Designed as no-laundry & material recycled or re-pulped as paper.*



Garment constructed from paper: 40% pulp/3%cmf/57% pla, (Rise/Innventia AB) dyed with cochineal (UAL) designed & constructed using ultrasound patterning, cutting and seaming (UAL & Triumph Needle Co. Ltd).

The idea of making a prototype garment is to see what the potential is for it to be bought by people, and liked, and appreciated, and desired. Because if they do, more money is put into it. It takes investment to develop these things. The investment doesn't come without a convincing argument put to investors. They need to believe that there is a viable product that consumers would take up.

I saw it in the attitude of the scientists and technologists that we were working with and with the business studies people too. I think there was a genuine understanding through prototypes that there could be a shared activity that had relevance to all participants and to the promotion of it.

**BECKY:** Could you have done this without making? What would have happened?

**KAY:** No, definitely not, I'd say to that. Because you have to speak the language of the people you're talking to in terms of fashion companies and consumers you're relating to. You have to show them what you mean, so that they can understand it from their own experience. It's well known, I think, that if people are given statistics relentlessly - and this is borne out by climate change - they glaze over in the end. When they see an image of a sea with no water in it or somebody really struggling as a result of some damaging process, they can relate to that because it's human and it's tangible from their own experience.

I think if you make something to carry the idea, it's not enough in itself as you quite rightly said earlier. It needs explanation. It needs description. Most of all, it needs to become a metaphor for the ideas you're trying to promote.

I think we achieved enough in the project to establish the fact that design had a place, not only in proof of concept material, but also in its meaning in context, and how people responded to it.

**BECKY:** When we laid samples on the table for the material scientists, asking "what quality can we achieve with this, and what do you think people might think of it?" the project definitely came to life. It happened because of those material things we were working on.

**KAY:** One of the fondest memories I have of the whole experience of that project, was a presentation we did in Chelsea, actually. We were talking to the papermaking research group from Sweden who had come to get a clear idea of what it was we wanted to produce. The best thing I could think to do, because it was so unfamiliar to all of us - us and to them - was to present a material swatch as a brief.

The swatch was a boiled-up bit of knitted cashmere and it was utterly beautiful, and soft, and comforting, and elegant, and lovely, and we said, "That's the brief. We want to have paper like that."

I think they understood it far more than if we'd been trying to show them images of ideas. We did show images and described our ideas as well, but showing them that piece of material - and it was referred to many times afterwards by the same people as being key - was actually a really good common element for all of us to respond to. We said "Well, what then do we have to sacrifice and achieve in the papermaking world to get the material qualities that we're feeling here?" Clearly, it was an important event.

They made paper as soft as that sample but couldn't make it strong enough to wear. They could make it strong enough to wear but they couldn't quite get it as soft as that sample. All those findings were really useful stages in the development. It was the combination of paper design and finishing processes that resulted in some viable material. Even at the end, we only had a small amount of stuff to play with, to dye, to construct with and so on. But at each stage, we effectively referred back to that event as the holy grail of what we were trying to get to.

## Notes

<http://mistrafuturefashion.com>.

<https://www.circulardesignspeeds.com>.

\* 45 g/m<sup>2</sup> paper produced on the Stratex semipilot paper machine at Rise/ Innventia AB and a variety of finishing process applied. Composition: 40% sulphate softwood paper pulp, from sustainable forests, unbleached, unrefined; 3% CMF microfibrillated cellulose from wood and 57% polylactide (PLA corn starch) staple fibres, from USA. Future development could include PLA from wood pulp to create a fully forest-based material and recovered or regenerated materials.



**Project  
Researchers**

# Translational Design Research

## for Systemic Materials Development

Rosie Hornbuckle

*Dr Rosie Hornbuckle is Post-Doctoral Research Fellow at the Centre for Circular Design. She joined CCD in 2015 to develop her ideas around materials cycles, design and communication in relation to materials development in multi-disciplinary collaborative research. She is also a member of the Service Futures Design Research Group at London College of Communication.*

Circular Design is inherently systemic, it is the framework by which we can connect material flows and their impacts with human experiences and actions.

Through a number of small and large collaborative research projects and various experimental methodologies it has become clear that working with other disciplines is both essential and incredibly inspiring in driving change through material and human interactions. Central to this change in the ways we approach design, from the shaper of stuff to the enabler of circles, is the ability of design researchers to be translational between disparate worlds of theory, practice and experience, from materials science to marketing, to social sciences, manufacturing,

policy and use. Making the intangible tangible and the complex relatable, both within projects and externally. This short essay will explore the changing role of design research in circularity to one of translational practice.

### AS NEW MATERIALS EMERGED SO DID A NEW WAVE OF MATERIALS COMMUNICATION RESOURCES

When I first started to explore the relationship between 'recycled materials' and design as part of my doctoral research in 2006, the aesthetic still largely involved making waste visible. No one was talking about circles in relation to materials. My research looked at how designers could encounter and specify secondary materials and, as I was based in the sustainable materials collection at Kingston University, physical material resources were an obvious place to start. At that time there was a real excitement about new materials and materials libraries were popping up throughout Europe and beyond. Yet having worked at a materials library I felt that the value of these resources was not only in the hundreds of miniature squares held in numerous drawers or shelves, or in the four walls that contained them. The real value, it seemed to me, was in the people who passionately researched and curated the collections and used the samples as a communication tool to engage a range of stakeholders in material development and application.

I immersed myself in the materials communication ecosystem that was emerging in London and between



*Translating a scientific survey of textile waste into a design-oriented sample collection as part of the Trash-2-Cash project. 112 fibres (exhibit) shown at Making Circles exhibition, Nov 2016. Rosie Hornbuckle & Helena Wedin.*



*Translational tactics in design research: employing visualisation and co-design methods in response to sticking points in communication and collaboration. Trash-2-Cash workshop 5, Materials Connexion Italia, Milan.*

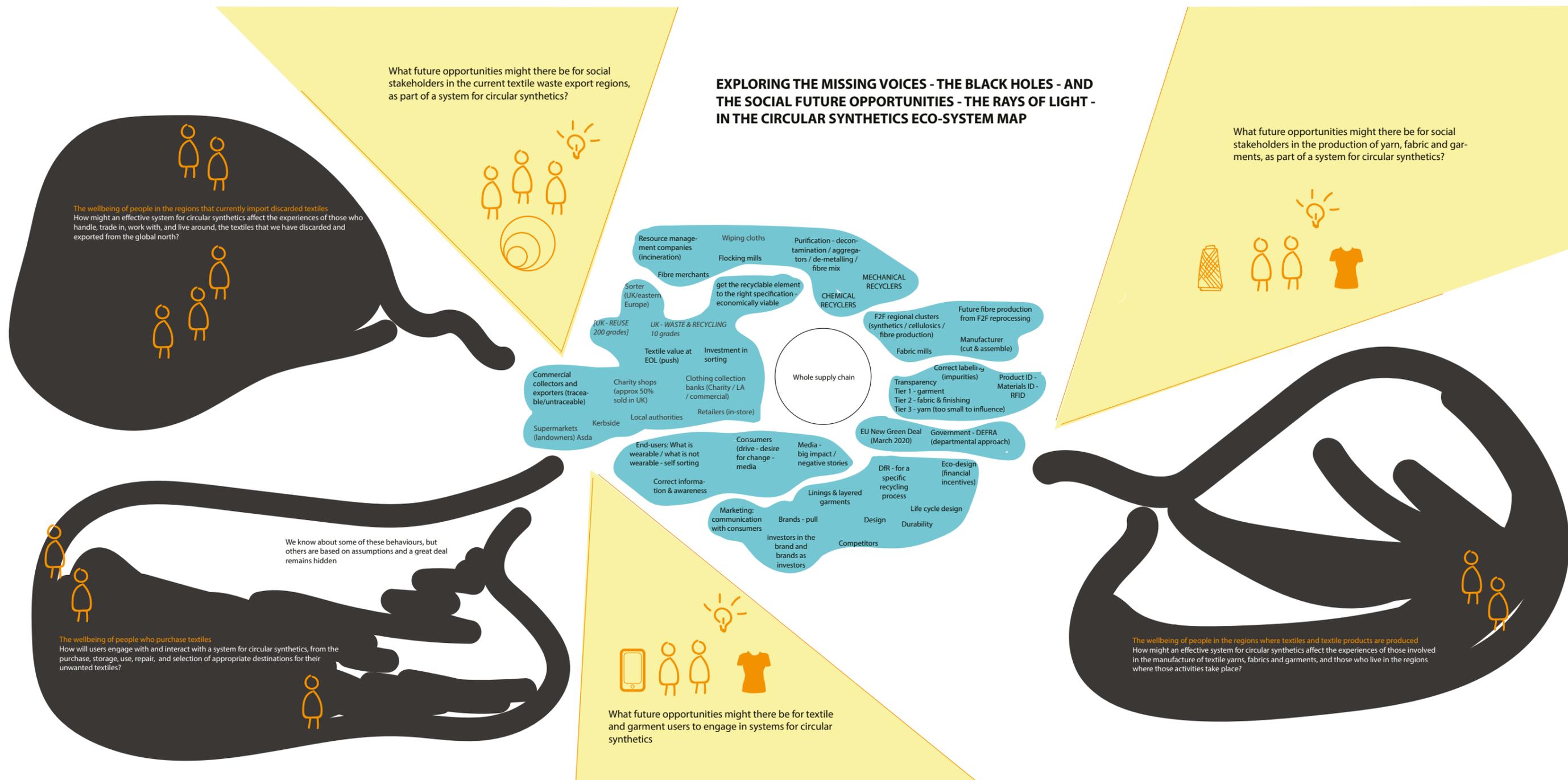
2007-2008 I was lucky enough to be involved in the first Materials Library Presents... series of materials engagement events at Tate Modern and the Wellcome Collection'. These were public-facing interactive showcases where 'curious people' (around ten of us) hosted materials experiments conceived by Mark Miodownik and Zoe Laughlin (Kings College and now UCL), and Martin Coreen (Goldsmiths). As we excitedly invited people to blow lead trumpets and paint using brushes made from human hair, we were being asked by these materials curators to help people engage in the materiality of art and science, to encourage them to explore their own expectations of what things are, and can be, made from, and in turn better understand the relationship between science, the material world and our own experiences.

This is possibly the best example that I came across during my studies, of the powerful ability that some people have to be able to translate the complex and intangible properties of unfamiliar materials into something that is understandable and relatable to people who have very little technical materials knowledge.

During my research I identified a number of people – mostly (but not exclusively) those with a design background – with a particular interest in new materials who made it their role to communicate the benefits of these materials to the design industry, including designers, retailers, architects, marketing people, business owners, makers and so on. The potential value of this capability became apparent as I began to realise that for secondary materials to be encountered and used effectively, their properties would need to be translated into benefits for design, so that they could be understood in different contexts of application. The role of the translation would be to make the knowledge accessible to designers and other design stakeholders who are 'locked' into conventional material and processing practices which perpetuate linear material flows.

### FROM 'RECYCLED MATERIALS' TO SYSTEMIC MATERIALS DEVELOPMENT

Fast forward a decade and The Circular Economy has completely transformed the way that we conceptualise 'recycled materials'. We are now reframing these 'waste' materials as an increasingly important resource, a 'raw' or 'renewable' material, and understanding material



Who is missing? A sketch exploring the 'black holes' in our eco-system map for Circular Synthetic Textiles; areas where social impacts, experiences and behaviours are uncharted and therefore underrepresented in the decisions relating to the development of new technologies. Work-in-progress, as part of the BFTT project [www.BFTT.org.uk](http://www.BFTT.org.uk).

life cycles as a systemic problem affecting decisions at all points in the material journey. The well-versed adage that 80% of a material's impact is decided at the design stage<sup>2</sup> becomes increasingly unconvincing, given how connected and subservient the commercial design process is to the decisions and assumptions of a range of actors.

Instead, what would happen if we consider that 100% of the impact is formed by the decisions of all actors who develop, spin, dye, weave, knit or flatten, print, textile design, fashion design, source, brief, market, manage, sell, buy, use, reuse, dispose, collect, ship, reprocess, burn, and regulate. This is not one person's (or one organisation's) responsibility; what we need is to 'get the system in the room'<sup>3</sup> and make it everyone's responsibility, as challenging as that may be. This also requires us to acknowledge an uncomfortable truth that while we need brands to drive circular change, we also need to shape that change to challenge those commercial models which increase material throughput exponentially.

This requires us to think carefully about who those stakeholders are, who should have a voice in systemic materials change so that it is not viewed entirely through the lens of commerce.

## HOW DESIGN INTERACTS WITH SYSTEMIC MATERIALS DEVELOPMENT

Over the past ten years there has been a sea-change in the way that practice-based or applied design research defines itself, challenging the idea that a designer is just another cog in the production machine<sup>4</sup>. At CCD this has prompted us to ask questions of our roles as Design Researchers, explore new practices, and develop tools and methods to meet a range of challenges. This could be seen as moving along a path from micro to macro<sup>5</sup> levels of action, to where we are today, working with other disciplines on the collaborative development of materials that are more appropriate for circular systems, for example in the EU project Trash-2-Cash<sup>6</sup>.

Within systemic materials development there is space for a range of design research approaches, the challenge is not only product-oriented but also involves communication and circularity challenges, and provocations. In this space Design Researchers are multi-tasking, recognising sticking points in the collaboration and seeking communication solutions, soaking up the inputs from other knowledge areas and interpreting them into new directions for the materials development at

different stages of the life cycle, and with a critical eye on context<sup>7</sup>. In Trash-2-Cash there were a number of different design approaches: Becky Earley's work with faces, voices and meditation to enable collaboration<sup>8</sup>; Kate Goldsworthy and Dawn Ellam's collaborative Life Cycle Thinking tools<sup>9</sup>; Van Berlo's industry tools to challenge the groups' ideas around trends and innovation<sup>10</sup>; and my work with Material Connexion Italia to bridge the knowledge areas with materials samples and facilitation<sup>11</sup>.

## TRANSLATIONAL APPROACHES TO TECHNOLOGY IMPLEMENTATION

Across the river from Chelsea, at London College of Communication, I have been privileged to work alongside Professor Alison Prendiville and Dr Silvia Grimaldi on another design-science collaboration: Pharma Factory as part of the Service Futures Design Research Group (SFDRG)<sup>12</sup>. This project focuses on a very different 'market' but with similar translational challenges, as we seek to bridge a gap between a pharmaceutical technology and the many stakeholders in the resulting products.

Although the field of knowledge is very different to Trash-2-Cash, the translational dimension in Pharma Factory is similar; as Design Researchers we have a sensitivity to this space between what is provided (technology) and those impacted by technology's implementation; what is needed, desired or valued.

We are exploring – in quite an experimental way – how we can apply our skills to identify methods and language which can help to traverse these borderlands in search of mutual understanding<sup>13</sup>. Translational research is much more established in the field of healthcare, but it has been almost exclusively the work of social scientists until service design emerged as a powerful ally.

However, perhaps what Design Researchers can offer here is the freedom to explore, unconfined by the conventions of scientific research.

Design Researchers turn findings into insights which in turn gives license to action. Unlike other fields of research, Design Researchers can play, explore and experiment to arrive at new possibilities and outcomes. Design Researchers can demonstrate co-created knowledge in tangible forms through visualisation and making, exposing what others find it difficult to see, whether that's a design prototype, a process visualisation, drawings which reveal our common ground, how material samples relate to a concept, how information aligns to the concept of circularity, or a map which shines a light on what or who is missing from the conversation.<sup>14</sup>



Getting the system in the room: Design Researchers facilitating multidisciplinary collaborative working through new tools and methods. Trash-2-Cash project, workshop 6 at Chelsea College of Arts, UAL. November 2016.

## Notes

1 An archive of these events is available on the Institute of Making website: <https://www.instituteofmaking.org.uk/events/detail/materials-library-presents>.

2 Thomas E. Graedel Paul Reaves Comrie Janine C. Sekutowski, 'Green Product Design,' *AT&T Technical Journal*, vol.74:6 (1995):17-25.

3 Patricia Shaw, *Changing Conversations in Organizations: A Complexity Approach to Change* (Routledge, 2002).

4 Paul A. Rodgers and Craig Bremne (eds.) *Design School: After Boundaries and Disciplines* (Vernon Press, Delaware, 2002).

5 Daniel Christian Wahl and Seaton Baxter, 'The Designer's Role in Facilitating Sustainable Solutions,' *Design Issues*, vol.24:2 (2008): 72-83.

6 For more information see [www.trash2cashproject.eu](http://www.trash2cashproject.eu).

7 Rosie Hornbuckle, 'What else do we know? Exploring alternative ways of using design knowledge and skills in the development of circular textiles,' *Journal of Textile Design Research & Practice*. vol 6:1 (2018): 23-41.

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9 Kate Goldsworthy and Dawn Ellams, 'Collaborative Circular Design. Incorporating Life Cycle Thinking into an Interdisciplinary Design Process,' *The Design Journal*, vol2:1 (2019):1041-1055.

10 Christian Tubito, Rebecca Earley, Dawn Ellams, Kate Goldsworthy, Rosie Hornbuckle, Kirsi Niinimäki, Emma Östmark, Veronica Sarbach and Marjaana Tantt, *APPLIED DDMI: A white paper on how Design-Driven Material Innovation methodology was applied in the Trash-2-Cash project*. EU H2020, White Paper, Trash-2-Cash, EU H2020.

11 Rosie Hornbuckle, 'Materials Liaisons: facilitating communication in design-driven material innovation (DDMI) projects' (paper presented at the DRS Conference, Limerick, 25th-28th June 2018).

12 For more information see: <https://pharmafactory.org>.

13 Rosie Hornbuckle, Silvia Grimaldi and Alison Prendiville, 'Beyond Science Communication: a service design approach to building mutual stakeholder understanding in the development of novel biotechnologies.' (paper presented at the *Design 4 Health 2020*, 2020 Lab4Living Conference, Sheffield Hallam University, 1st July 2019). See <https://research.shu.ac.uk/design4health/publications/2020-conference-proceedings>.

14 This relates to figure 4 where we are identifying 'black holes' in our techno-economic focused eco-system map where social impacts, experiences and behaviours are underrepresented, as part of work package 5 of the BFTT project. See [www.BFTT.org.uk](http://www.BFTT.org.uk).

# Joining the Dots

## An Interview with Helen Paine

*Dr Helen Paine has worked at Centre for Circular Design since 2016 as a post-doc research assistant and independent researcher contributing technical and creative materials expertise across multiple projects. She is a trans-disciplinary textile design researcher and lecturer; her experience bridges the fields of design, science and engineering working and often links with industry partners.*

**BECKY:** What was your PhD about? What made you decide to do one, and what kind of research did you end up doing? What were the key insights?

**HELEN:** Whilst studying for my Masters I had the opportunity to work on collaborative 'live' projects with external companies. Through these projects I gained insight into how textile designers could bridge into other disciplines; extend beyond their established disciplinary boundaries and have impact in surprising and new contexts. I felt excited by the opportunity to respond to real industry briefs and influence change through material design.

Inspired by these exciting project briefs, I sought further opportunity to collaborate outside my discipline and began working with TWI, an Engineering R&D research facility situated on the outskirts of Cambridge.

The environment at TWI was very different to the white-washed art schools that I had frequented for the last 8 years in London. However, there was a whirr of machinery and hands-on experimentation in the lab that somehow felt familiar.

During an initial meeting I shared my portfolio of experimental samples, exploring combinations of knit and print technologies. including one particular technique which used coating on the surface of knitted structures to create an unusual aesthetic.

**The scientists were interested in this work from a technical perspective and**

**were able to see possible application opportunities previously unimagined by me.... "We've been looking for a way to create a fabric that changes across the surface without using seams to join two-pieces of fabric together". Our interests met over a shared fascination of textile structures and technical capability.**

This was the start of a process which resulted in my PhD which explored the creative and technical potential of textile joining technologies with a focus on stretchy fabrics.

I worked at TWI's headquarters where I threw myself into a world of textiles joining. I had high frequency, laser and ultrasonic equipment at my disposal – and I was more or less the sole user of these pieces of kit on a day to day basis. I was like a kid in a sweet-shop – albeit a little bit tentative to begin working in an unfamiliar environment amongst scientists. This all felt quite alien – and exciting – to begin with, but I soon became accustomed to different ways of working and gained an understanding of how to structure experiments and record my experimental process more rigorously so that it could be reported for wider dissemination. My colleagues at TWI also gained insight into a more creative sampling method of working by observing me in the lab. I used the equipment to sample ideas in much the same way as I had during my MA as I moved through a creative process of trial and error working with different fabrics – searching for opportunities to develop.



*Mistra Future Fashion project. Preparing 'ultra-fast' non-woven samples for testing at RiSE, Inventia, Sweden. 2016.*

A combination of reviewing the literature and practical experimentation enabled me to build hunches – and eventually more developed hypotheses – about ways the technologies could be used and developed. I was particularly interested in seeking solutions for welding stretchy fabrics – that are used in many technical applications but are largely incompatible with welding as the weld shears when the fabric stretches. I was also fascinated by the aesthetic potential working with stretchy fabric types, which rucked and puckered with heat under pressure. The latter stages of the research focussed on development of functional surface and seaming techniques for stretchy fabrics and partnered with Speedo International for insights and assistance with prototype development.

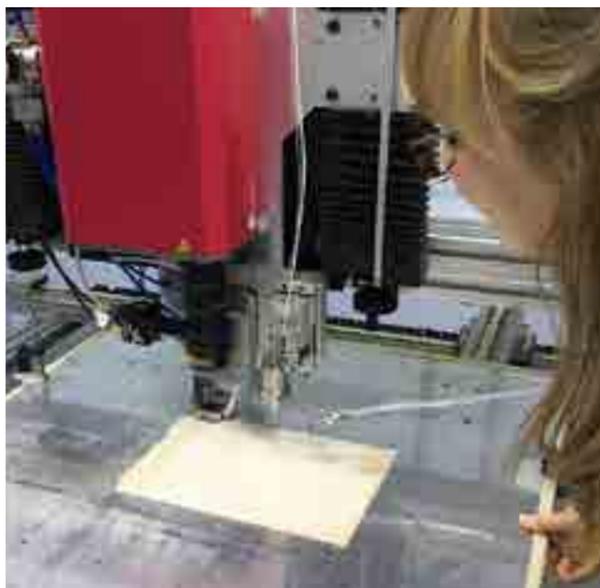
The laser technique developed by the PhD offered the opportunity to increase the control over the level of compression without adding any additional material to have an increasingly graduated effect. Compression on the body could be controlled by varying the laser parameters (speed, power) to affect the level of fibre melting through the depth and across the surface of the fabric. Testing facilities and equipment – including Scanning Electron Microscopy, Tensile Testing and 3D Body Scanning – made available to the research

at TWI and Speedo International made it possible to quantify the impact of the welding process precisely.

Aside from the technical contributions made by the research, I am able to understand more fully with hindsight the methodological insights that have continued to interest me in my career moving forwards. Through the PhD I developed a methodological framework that oscillated between scientific and creative modes of investigation supported by industrial insight. I continue to work in spaces – and seek spaces to work – that bring different disciplines together. This is where I believe truly exciting and innovative work can happen – where the knowledge between disciplines is bridged and shared to inform solutions that are arrived at and developed collaboratively.

**BECKY:** With this background in practice research and material innovation, what was it you first did when you joined CCD? What were the key insights from these roles?

**HELEN:** Soon after completing my PhD I joined Centre for Circular Design (CCD) as a Research Assistant on Mistra Future Fashion (MFF). I felt like I had been headed towards industry during my PhD – but a brief spell working for an automotive textile supplier as innovation lead refocused my direction.



Helen Paine working at TWI on laser-finishing of Kay's 'ultra-fast' Mistra Future Fashion samples, 2016.

Coming back to work in academia – and particularly within the design school environment – it was a joy to partake in conversations again that imagined possible futures and used creative practice to test and push towards these ideals.

The circular context for the work – with the history of the centre embedded in 20 years of sustainable textile design research – had not been the focus of my PhD; however, I enjoyed immensely building my knowledge of this field and framing material development through this new lens.

I worked closely with lead researchers on the development of materials. I returned to work on the laser at TWI – to test materials for both slow and fast material concepts that were being developed in parallel throughout the project. It was also an opportunity to build on my prior experiences collaborating with scientists and industrial specialists. I liaised with material and social scientists at RiSE on development and testing – particularly of the non-woven fast material concept. Moving between the art-school and the scientific lab was embedded within this project – and surprisingly to me, had become my comfortable space.

During this time, I was awarded funding to investigate the UK non-wovens industry – with a view to gaining insights for scaling-up of the fast material concept within MFF. The research sought to understand and uncover

what UK networks and infrastructures were available to support localised production of non-woven material. An introduction to the UK Nonwovens Network provided insight and introductions to existing manufacturing facilities within the UK and highlighted often overlooked UK-based capability in the technical textiles sector.

The research also highlighted that innovative sustainable material solutions made from alternative fibres – often bio-based and/or by-products from industrial waste – are frequently made using non-woven processes, which have the capability to convert fibres into 'cloth' with very limited processing steps and therefore a reduction in carbon emissions.

Returning to my role within MFF I became much more involved with the industrial context for the project – which involved working with Filippa K to apply the fast and slow concept work. The value of academic expertise and knowledge within applied industrial contexts was really evident.

The bridging between disciplines to tackle wicked problems, related to building a circular future, is fundamental to the work that CCD does. Experts within different fields are having to learn new methods of working collaboratively – to extend the reach of their previously siloed efforts.

Researchers at CCD work with industrial clients and partners to share the insights from their research through 'Knowledge Exchange'. Exchanges of knowledge through interdisciplinary collaborative research – and between academia and industry – continue to fuel my career interests as I bridge between fractional research and teaching roles at Chelsea College of Arts.

**BECKY:** How are you currently exploring new ideas in CCD?

**HELEN:** I am now working at the Centre for Circular Design on the Business of Fashion, Textiles and Technology Programme – employed as an R&D Project Lead working with Ananas Anam on the development of Piñatex – a non-woven material made from pineapple leaf fibres. The Company Lead within the project team is from a Chemistry background so the science/design/industry triangle continues to form the basis of my work.

Simultaneously I am working as part of the Textile Design teaching team at Chelsea College of the Arts – with a role that has a professional practice focus. Within this role I develop and deliver content that supports students in navigating their own

professional journeys – and am passionate to represent the growing breadth – and changing scope – of opportunities for Textile Designers, particularly that can come about through collaborative practice.

I recently engaged course alumni in a series of lectures called 'Textile Tracks', which aimed to demonstrate the diverse and varied career paths for Textile Design graduates – specifically from the course at Chelsea. The invited speakers were selected to represent the growing breadth of opportunities for Textile Designers in industry and academia – so that students feel inspired and empowered for their future career possibilities.

**I would also like to develop project briefs – perhaps with live partners – that introduce students to interdisciplinary working and begin to teach skills and build confidence for operating in this emerging field.**

I am passionate about the value of tacit materials knowledge particularly that possessed by Textile Designers – and aim to continue to carve out opportunities within my own research/knowledge exchange and teaching to demonstrate its value in diverse, socially and environmentally engaged contexts.

**BECKY:** Describe your perfect CCD project?

**HELEN:** My perfect CCD project would be engaged in creating circular material systems within the UK; working with existing and emerging infrastructures – bringing together academic expertise from the sciences, design and industry.

I foresee my experience – bridging between academia and industry – could be valuable within an interdisciplinary consortium and I would enjoy working with manufacturing partners – or supporting other practice researchers placed within manufacturing R&D plants – to develop innovative material solutions towards a joint circular ambition. I continue to seek out projects that bridge the gap between the white-washed art-school and scientific lab environment – because isn't what we're all trying to do ultimately the same thing?

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# Track and Trace

## An Interview with Kate Wakeling

*Kate Wakeling has been working with the Centre for Circular Design since June 2020 as a research lead on the Business of Fashion Textiles and Technology SME R&D project with Segura Systems to develop a new digital tool for sustainability tracking in the fashion and textiles supply chain. Kate comes to CCD with 12 years of industry experience in CSR and supply chain management. Since completing her MA in Fashion Futures at LCF (2011) she has worked with fashion retailers, brands and factories to establish ethical trade and sustainability programmes as well as designing and implementing broader sustainability strategies.*

**KATE G:** You've come to CCD after a long spell working in industry in a sustainability context. Can you tell us about your experience of working in this field over the last 12 years?

**KATE W:** When I moved to London, my first job was working at a fast-fashion retailer. I was blown away by the quantity of clothing we sold. There was a stockroom that was almost the size of the shop floor and it would be cleared out by the end of every day. This was eye-opening and disturbing for me. I loved fashion and witnessing this churn, this crazy level of consumption, I realised that fashion really isn't sustainable.

My first experience of working for a sustainable brand was People Tree, a brand which at the time was one of very few incorporating Fair Trade practices throughout the supply chain. What was particularly special about People Tree is that they were more aware of their supply chains back then, than most brands are today.



Outerwear factory, Romania

Working with them gave me excellent insight into what it takes to make changes at the producer or craftsman level. They work with the producer groups to figure out how to build capacity, to improve their quality and skills instead of dictating what is best.

From People Tree I decided that I wanted to explore how Fair-Trade fits into the wider fashion industry. Was it a premise that could be used by big brands? I did my Masters at LCF in Fashion Futures and used this as a platform to visit producer groups across Sri Lanka, India and Bangladesh.

**Through multiple discussions with NGOs and producer groups, it was easy to see that Fair Trade has a very important part to play in small-scale and artisanal production. However, when it comes to the vastness of the fashion industry, it was much more challenging to apply these same principles along their expansive and voluminous supply chains.**

I started working as the Ethics and Sustainability Manager at Ted Baker seven years ago. To begin with it was just me working with the non-profit consultancy (that is sadly no longer around) Made-By. This is a sign of just how much the emphasis has changed in the past five years or so. By the time I left Ted Baker I had a team of five working with me, and we were very busy!



Factory floor, Philippines.

The landscape has changed dramatically, concepts that are now familiar wouldn't have been heard of by the average person five years ago. A huge catalyst was the Rana Plaza disaster in Dhaka, Bangladesh. This tragedy has made people much more aware of the impact that consumption has on those they can't directly see. It has led to the forming of organisations like Fashion Revolution – ensuring consumers are more aware of the power their actions have. The press is also becoming more involved in exposing the nefarious underbelly of the fashion industry. Where they used to only report on the most extreme of offenses, they now report on transgressions like low wages and overtime, all of this momentum helps push the fashion industry to change for the better.

Legislation like the Modern Slavery Act has forced businesses to look more closely at their supply chains and talk publicly about what they find. Where five years ago only the most progressive brands would publish their factory lists, it is now common practice. During this time consumers and brands have also become more aware of the environmental disasters attributed to fashion, from polluted rivers to microfibres in the oceans and even deforestation. Brands are beginning to work in consortiums and alongside NGOs to mitigate these issues. There is still a long way to go but it is more difficult to hide now.

**KATE G:** With this extensive background in industry CSR and supply chain management, what made you decide to change direction and apply for the Segura project and become a researcher?

**KATE W:** I wanted to explore something else and needed a fresh challenge. It's very tricky when you are busy working in a corporate job to do anything particularly revolutionary. Profit will always come first and therefore visionary sustainability initiatives are difficult to get past the board. There is little time to look deeply into the interesting things that are always cropping up in fashion sustainability circles. Becoming a researcher was a way to take time to look closely at this section of the industry (and time to work on other projects!)

My role at CCD is as project lead on a project with Segura Systems developing a Sustainable Supplier Marketplace. The project is looking at how to design a B2B platform enabling fashion retailers to engage directly with suppliers. From the outset retailers and brands will be able to gauge each suppliers' level of sustainability commitment. This will ultimately help improve manufacturing sustainability standards, reduce unethical practices and we hope, encourage transparency in the supply chain.



Factory corridor, Vietnam.



Sampling threads, Guangdong, China.



Screen printing, Philippines.

This project felt like it was designed for me. It is a combination of all the really good stuff! Data, sustainability, technology and transparency.

I was lucky enough to have worked with Segura when I was at Ted Baker, so I knew they were an exciting tech company. The project was also looking at how to simplify or at least demystify the complex world that is sustainable certifications – and this is the holy grail of sustainability! There is a genuine need for this platform in the industry and being able to help shape it is fantastic.

**KATE G:** How is the project going? What do you think is most exciting or challenging about it?

**KATE W:** We are three months in and it is going very well so far. I am fortunate to have had such a well-designed project to start from. So far I have spent an inordinate amount of time studying sustainability certifications and standards. It is very important that we (the project) don't make any judgement calls as to which standards are better than others – we can only present the information as it is presented on public platforms. It is also important to remember that most of these standards, although seemingly niche, serve a purpose in their part of the supply chain. From a brand or customers perspective these standards may seem to only cover a small part of the supply chain, but from the workers perspective and from the environment's too, this is not the case. There are millions of people working at each stage of the supply chain, from farm to factory, every step involves many people and potential environmental harm.

So it is tricky to take these complex and important standards and try to distill them down into a list of criteria and tick boxes. But it is ultimately important for brands to be able to compare these standards without the nuance that comes with knowledge and opinions they already have.

**KATE G:** Such an exciting initiative! What are your hopes for the project and beyond? What are the biggest changes you want to see in the industry?

**KATE W:** Total transparency.

This project is just one small part of massive, systemic change that needs to occur for us to rebuild a transparent, just and sustainable industry. It's a big ask, but the landscape is changing and brands and customers are starting to ask the right questions. We just need to maintain momentum and not get thrown off by the perpetual search for bigger profits.

I believe this is possible. You can see it beginning in sustainably innovative startups. These companies will eventually be who the established brands look to for ideas. They are proof that the industry can change, and this project is one more exciting facet that will help bring about the transparency revolution!

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PhD  
Researchers

# Textile Design for Disassembly:

## *Temporary material systems for borrowed resources*

*Laetitia Forst*

*Laetitia is completing her PhD at CCD this Autumn. She is a multi-technique textile designer whose practice explores the tension between technical challenges and creativity in sustainable design for textiles. Her doctoral research explored the potential of Textile Design for Disassembly to increase recyclability in material combinations. She is currently a post-doctoral research fellow at UAL.*

Combining resources with diverging recycling routes has been widely recognised as impeding the transition to a circular textiles economy (Östlund *et al.*, 2015; Ellen MacArthur Foundation, 2017). This short essay considers one out of a palette of strategies that can be explored to circumvent current recyclability barriers: Textile Design for Disassembly.

### MAKING MONSTERS

How blindly we as designers have been taking and blending resources for our own aesthetically or technically driven purposes, with no thought for the future. In assembling materials from different cycles and creating these Monstrous Hybrids that can no longer be recovered and regenerated, we have put on our Frankenstein lab coats to create blends with little consideration for their afterlife and the damages they may be causing there.

To avoid resource depletion and waste, the circular economy brief suggests that materials should be transformed and used with their end of life recovery and regeneration in mind from the very beginning of the process. This foresight also means that materials with differing recycling routes should be kept separate to avoid difficulties down the line.

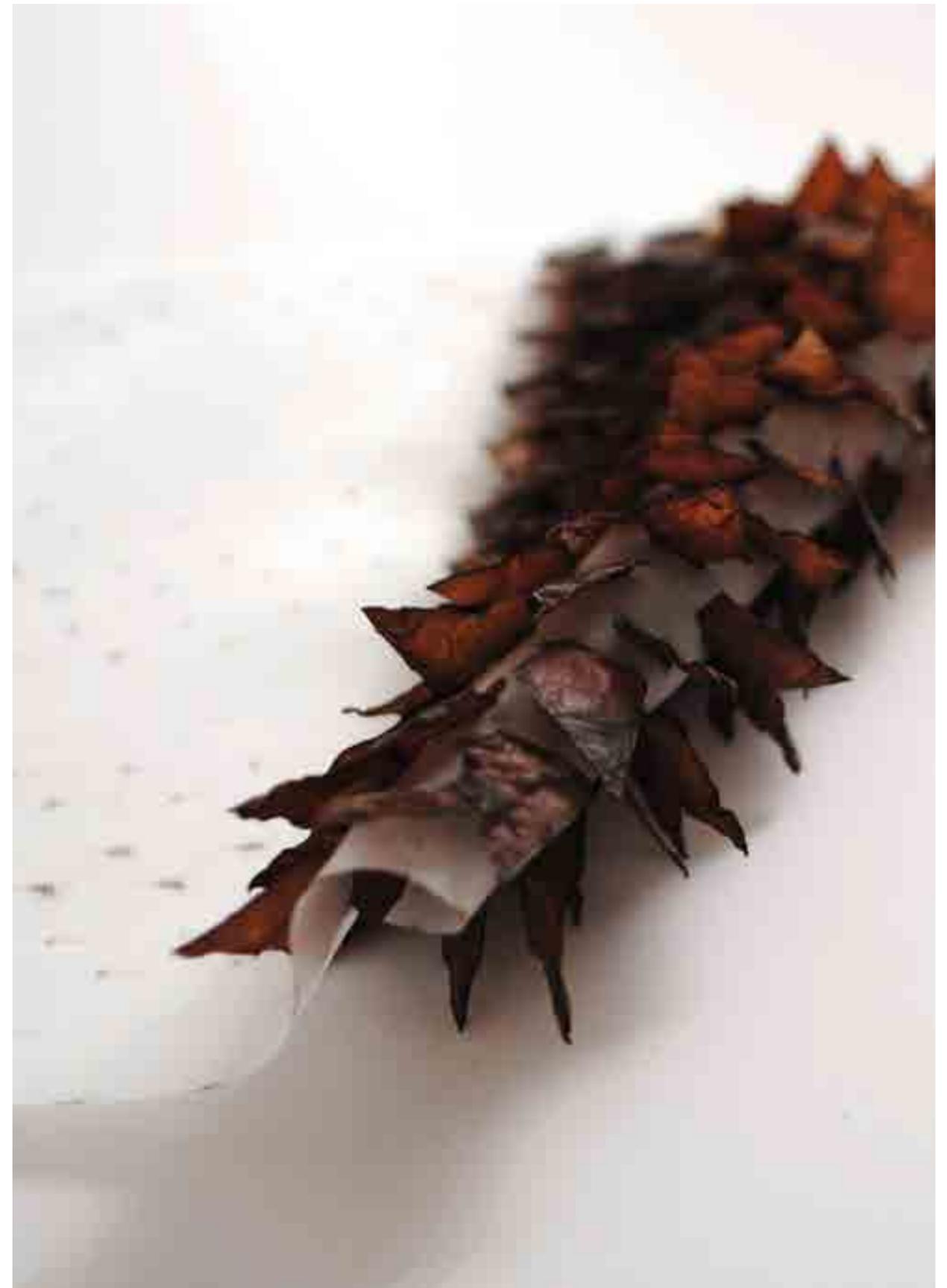
However, the ability to combine materials with complementary or contrasting textures, colours or other properties is essential to the work of textile designers.

The joy of pushing the boundaries of a raw material's properties through stitching, weaving, knotting, laminating, and finishing fabrics is what makes textile design so creatively rewarding. The beauty of a coarse wool thread winding, coiling, curling around a lustrous smooth nylon and creating a complex combination that tells a story of opposing forces is itself intertwined with the pleasure of making textiles. But how can this be done without creating permanent barriers to material regeneration?

### DESIGNING FOR DISASSEMBLY

Designing textiles for disassembly means that individual components that would normally be challenging to recycle together can be combined and then taken apart so that the highest value can be recovered from their recycling. These Beautiful Hybrids could be a temporary and considerate alternative to permanent blends.

The strategy can be added to the range of available options when designing for recyclability and can be an alternative to mono-material design when a mix of resources with different properties and recycling parameters is needed.



*Bio-cellulose 'sequins' are attached to a polyester fabric base using Textile design for Disassembly techniques and showing the potential for temporary combinations between resources with different lifespans and recycling routes. Photograph by the author.*

Other designers and problem solvers have come across this challenge of needing to combine different components and still be able to separate them, and there is a lot to learn from those involved in the use of toxic or rare materials (Vezzoli and Manzini, 2008; Ziout, 2014). Consider how for example they have been facilitating the extraction of gold from waste electronic products by making all the screws in the implement fall out when subjected to a high temperature. Now where are the screws in our textile combinations? Can we adapt the assembly techniques combining different materials so that they can be easily released when necessary?

It seems as though the time is ripe for designers to use textile resources with the same care for future regeneration as when dealing with rare minerals. Textile design for disassembly is a method that combines a variety of techniques for detachable connections which enable the recovery of the components in a fabric combination.

The approach puts textile design and creativity at the centre of the solution to blends. If we are to rethink material combinations, then it should be from the perspective of the designers which are currently creating the barriers to recycling. It gives a structure for the responsible use of materials as part of temporary assemblies which enable the end of life recovery of the components. This strategy isn't material-specific, the resources used in these combination "recipes" can be interchanged depending on the brief or the desired outcome.

### CIRCULAR SYSTEMS

If we are to take these techniques into the making of new types of material combinations, then what can this mean for the products that emerge from them? The techniques are meant to act as metaphorical hinges, enabling the assembly and disassembly of a variety of different materials and including these temporary combinations in open and regenerative systems. They suggest ways in which alternative resources which are challenging to use as mono materials could be supported by more conventional textiles. For example,



Textile design for Disassembly techniques: fabric elements are combined using laser cutting and hand assembly to replicate effects of embroidery that can then be taken apart by hand. Photograph by the author.

bio-based materials which present exciting aesthetic qualities but low resistance to friction and tear could be temporarily attached to a durable synthetic base and still fully compostable when the elements are separated. These types of extreme material assemblies offer a future probing outlook on the effective use of ephemeral and low impact materials for fleeting trends.

Another provocative aspect of textile design for disassembly is the way it moves away from the traditional techniques which currently prevent separation, and towards systems which can enable reversible assembly and disassembly without any specific textile skills.

The ease with which the components come apart for recovery opens up the process to the users and suggests new ways to interact with materials during the use phase.

This can be harnessed towards scripting new sustainable behaviours in which the structural qualities of materials enable transformations that can renew interest in the product and extend its lifespan before the full recovery for recycling of the components (Forst, 2018; Earley and Forst, 2019).

Design for sustainability and circular economies tends to give attention to the inherent environmental qualities of the materials, focusing on the reduction of pollution and responsible practices in the extraction and transformation process. While this is essential to moving away from harmful habits, using circular materials in linear assembly systems still defeats the overarching purpose.

A holistic perspective on circular design requires that we include the unmaking of the products into our design briefs so that the best possible outcome for material recovery can be achieved for every single raw material involved.

Beyond this, the systems in which these materials themselves evolve can be challenged. New material combinations can design ahead and anticipate changes in material flows. They materialise a vision for a future in which resources are borrowed, thoughtfully connected and then returned in a regenerative system. Textile design for disassembly acknowledges the transience of product journeys: what a relief to forgo the responsibility of permanent material blending and devaluation, and never again make anything that cannot be unmade.

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# A New Way to Play

## *Textile recycling and the Circular Economy*

*Cathryn Anneka Hall*

*Cathryn Anneka Hall is a MA Textile Design graduate of Chelsea College of Arts and has been at Centre for Circular Design since 2015 - first as a research assistant and currently as a PhD researcher. Her research explores design for mechanical textile recycling for the circular economy, conducted with industry partners. Cathryn's expertise in circular design extends to both lecturing and consulting with industry partners.*

Don't be nervous. Circularity is the captain and she is picking her players - nobody wants to be picked last. We are consistently reminded that Chemical Recycling, although appearing to be the best player on the team, can hog the ball and won't involve any of the other players. We still need training in Re-use and more practice shots with Re-manufacture, but it is Mechanical Recycling that is truly stuck on the side lines. Could there be a new way to play?

Textile recycling was born from a desire to reclaim wool and was quickly adapted to recapture cotton and then polyester. In 2006, the 'Well Dressed?' report condemned recycling technology for not progressing in over 200 years (Allwood *et al.*). Since this we have aspired to reach high-quality textile-to-textile recycling and chemical technology has boomed. In the wake of this invention we now find ourselves in a transition period, one where Chemical Recycling has not yet reached commercialisation. All the while academics start to call for new policies to advance chemical processes alone (e.g. Dahlbo *et al.*, 2016) leaving Mechanical Recycling on the bench. However, it is this established and now forgotten Mechanical Recycling industry that is still dealing with the world's textile waste. At this point do not be mistaken in thinking I am arguing against the development of Chemical Recycling. Rather I will argue that recycling, like the circular economy, is a team sport. We need both Mechanical and Chemical Recycling to play together.

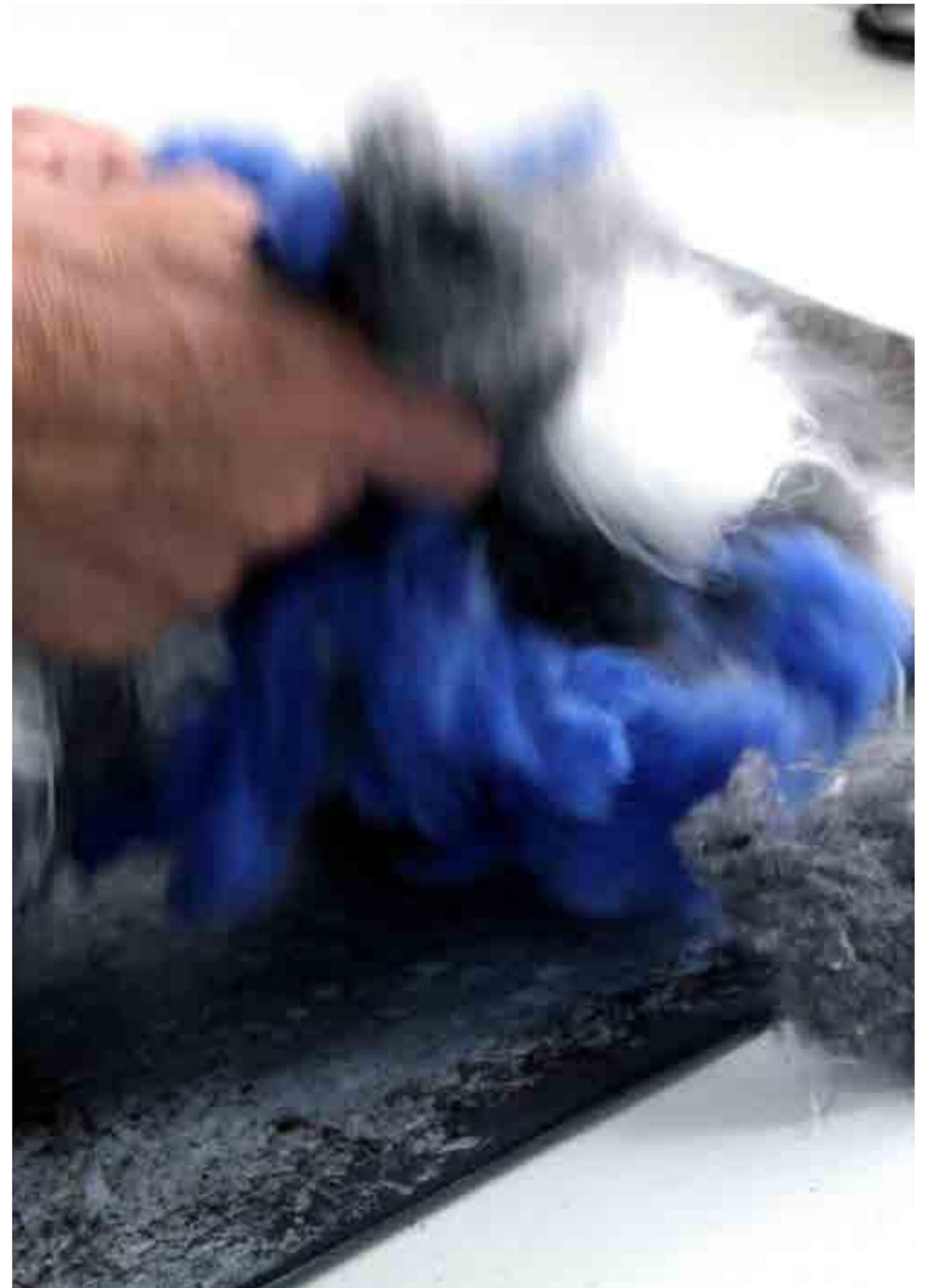
### THE PROBLEM WITH MECHANICAL RECYCLING

The Mechanical Recycling of textiles is the process of ripping fibres from their cloth. It is because of this harsh process that recycled fibres reduce in length and therefore it is more difficult (but not impossible) to spin them into yarns (Merati and Okamura, 2004:640). Therefore, to process and extend the lives of the recycled fibre, it is often necessary to blend them with longer virgin ones. This practice has been conducted since the invention of recycling to return our textiles into clothing amongst other applications. For Chemical Recycling blending is not required, although much like in virgin textile production blending is used to create functional, creative and economic textile materials. Therefore, it often faces the same challenges.

### THE PROBLEM WITH CHEMICAL RECYCLING

Chemical recycling is celebrated for its ability to return textile fibres to the same quality as virgin. This works particularly well with synthetic materials such as PET (polyethylene terephthalate, commonly known as polyester).

For wool, this chemical process is at lab stage and transforms the proteinous building blocks of the fibre into resins or wood-based adhesives but not textile applications (Bell *et al.*, 2017; Quartinello *et al.*, 2018). For cotton, chemical recycling has progressed in some cases to small-scale manufacturing levels. However,



*Testing blends of mechanically recycled fibre.*

the regenerated cellulosic textile generated from the process is different from the virgin cotton input. In simple terms, if you were to send a cotton shirt to a chemical recycling process the resulting fabric would be more like a viscose when it came out the other side. It is therefore not a direct replacement (WRAP, 2019; Östlund, Sverige and Naturvårdsverket, 2015). For example, the H&M Conscious Exclusive SS20 dress made from partly Circulose® (2020) a chemically recycled cotton. The dress' composition is described as 100% viscose of which 50% is FSC certified wood and 50% is Circulose® recovered from post-consumer denim.

### UNINTENDED CONSEQUENCES

The chemical recycling of wool textiles into resins, or cotton textiles into 'viscose like' fabrics is most certainly not something to be avoided. Rather I might suggest we need to consider the consequences of the systems we implement. We are reminded by Zink and Geyer (2017) of the 'Circular Economy Rebound' effect - the creation of materials that do not replace new production. If recycled materials are of lower quality or produced to solely enter new markets, they could create further demand.

For the circular system to work, all players must work toward the team goal. The quality of Mechanically Recycled material must be upheld, and Chemically Recycled materials must directly replace virgin production.

### IS TOGETHER BETTER?

The challenge of transitioning towards a circular economy remains. The two technologies, mechanical and chemical, are both imperfect in their own ways, but a shift towards team thinking is starting to emerge. During the Beyond Green: Zero Waste symposium (2016) Isaac Nicolson (working for Recovertext, a mechanical cotton recycler) described a future in which both mechanical and chemical technologies might work together. This counteracts the rhetoric that chemical is the substitution for mechanical. They can share the position switching at halftime to promote their own strengths on the field. This collaborative approach is now seen across large scale projects, such as Fibersort (2020a) by Interreg North-West Europe combining both technologies.

The approaches championed for resource longevity centre around promoting material loops (RSA, 2016). Goldsworthy (2014a:1) highlights that we often forget that materials can outlive us, reminding us to take the long view. Sandin and Peters (2018) also acknowledge this potential. They propose a cascading approach, firstly through mechanical systems then, ultimately, flowing into chemical ones. For example, woollen textiles cascading across multiple applications, such as a knitted jumper to a woven upholstery fabric to a non-woven insulation product. Finally, the fibres would flow into a chemical system to be used as a resin, outside the textile remit. The problem of continued circulation, in this open loop, falls to another industry to solve.

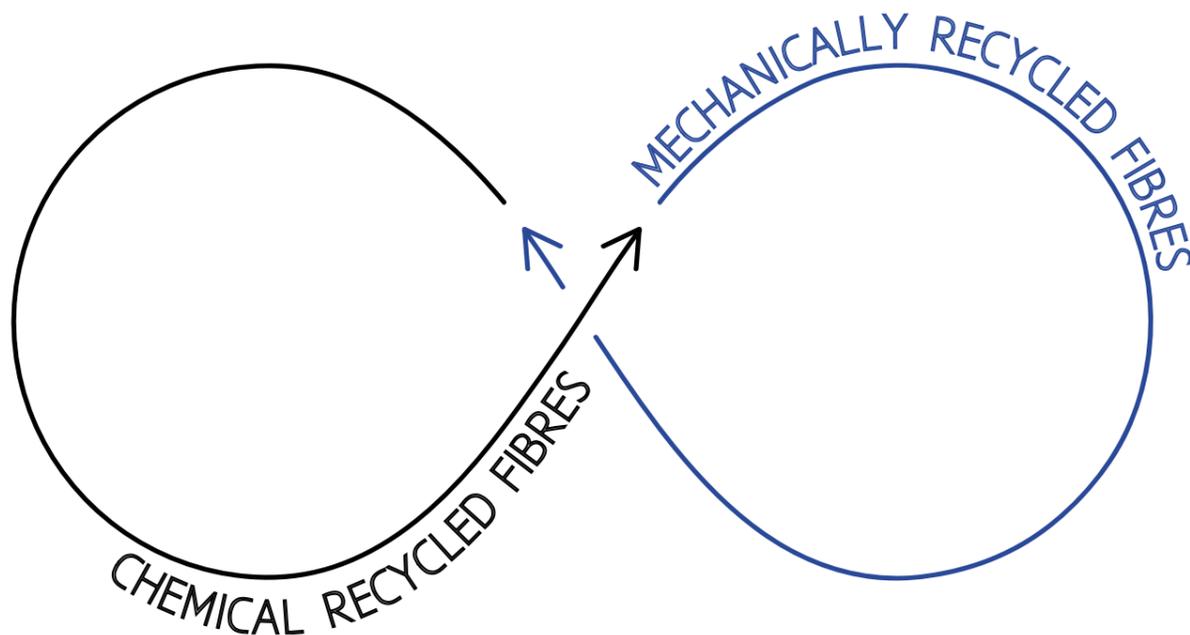


Illustration of a combined textile recycling system using both mechanical and chemical recycling technology.

Beyond linking the two systems together, what if the limitations of both Chemical and Mechanical Recycling could be used to support one another in a closed loop? Consider cotton: we have established that the resulting cellulosic material from the Chemical Recycling process is not a direct replacement for our cotton textiles. Therefore, in order to produce replacement a mechanical method is required. But these fibres need to be blended with longer virgin ones.

So, what if our future chemically recycled fibres replaced virgin content as the blending agent? By using the chemically recycled cellulose (in replacement of virgin fibres) this would not only aid the mechanical recycling process but result in a fully recycled textile.

The blending of these two cellulosic materials, without contamination, ensures that the final textiles can, at the end-of-life, flow back into the chemical process. Recycling textile fibres in this combined way, illustrated in the graphic, means materials flow back and forth between both Chemical and Mechanical Recycling systems. This, ultimately, will extend the life of our textile resources. After all, in this circular economy game both processes are on the same team, sharing the same goal. Might this be the new way to play?

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# What is Fallout Fashion?

Emmeline Child

Emmeline is a part-time PhD researcher at CCD. She developed the upcycled label Emmeline 4 Re in 2003, selling her collections in TOPSHOP and independent retailers across the UK and Europe before establishing her own sustainable boutique in London in 2007. She is currently Programme Leader BA (Hons) Fashion, Faculty of Arts Science and Technology, University of Northampton.

What is 'fallout fashion', where does it come from and why is it such an issue for the global fashion supply chain?

This short essay will look to outline the recent growth of this waste stream, as well as sketch out some of the barriers that have hindered its re-use. The essay concludes by arguing that if we choose to embrace this waste as a creative resource it could offer additional product cycles within the supply chain that could add value to the textile industry and contribute to the development of a circular economy.

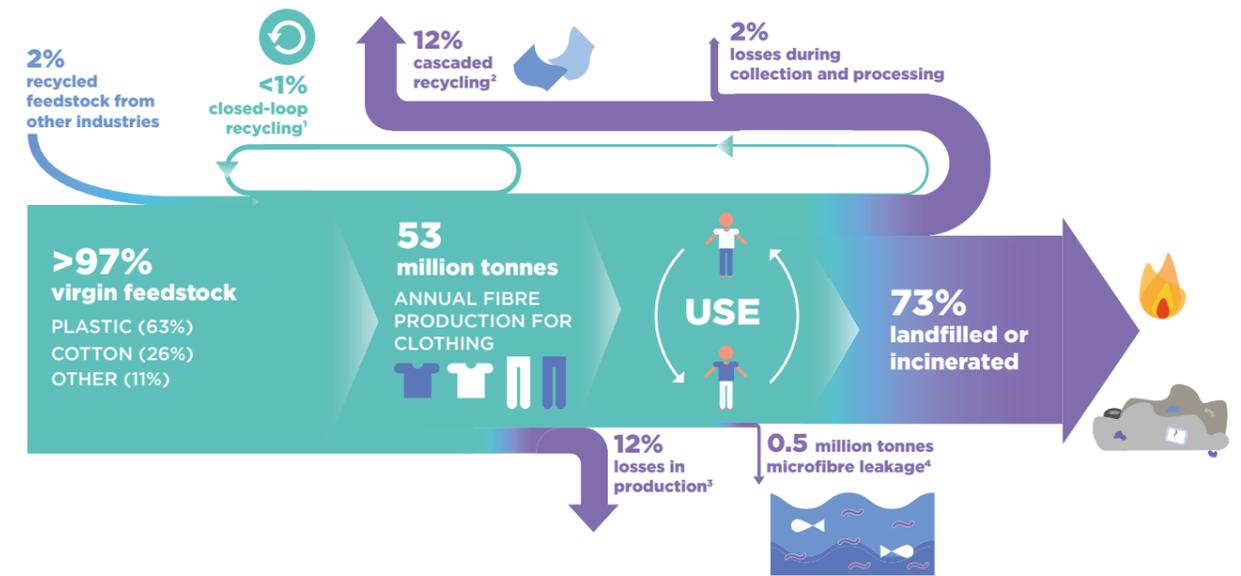
The fashion industry has an incredibly complicated supply chain employing more than 300 million people (Ellen MacArthur Foundation, 2017:36). The result of this is a fragmented and disjointed system where many stakeholders work in isolation. As mass production has grown, with volumes doubling over the past 15 years (Ellen MacArthur Foundation, 2017:36), so has the gap between the design and manufacturing process. This is because demand for ever-cheaper production has pushed manufacturing further afield to developing countries. The result of this is an inefficient and unsustainable industry, where a holistic understanding of the supply chain has diminished, and issues of waste have become exasperated by the volumes of cheap products being produced. (Moreton and Simpson, 2016:8) This has led to complex issues arising around mass production and consumption, with waste being an increasing problem to deal with along each stage of the extended supply chain, estimated to have a value of more than USD 100 billion worth of materials each year (Ellen MacArthur Foundation, 2017:20).

With the increasing rates of overproduction of clothing in the fashion industry, there is also a rise in the quantities of pre-consumer (virgin) waste being underutilised.

Reet Aus states that waste comes from many different streams of the supply chain including 'leftovers from stores and company product development, defective returned goods and outsourced garment shipments' (2011:49). Within a textile manufacturing facility waste occurs at any point in the production line of the textile and clothing sector (Mutha, Li, Hu *et al.*:1066). This virgin material waste is called 'rejects', 'left-overs', 'cabbage stock' or 'fallout' (Aus, Gunawardhana, Baker 2017:2, 2, 2).

This waste or 'fallout' can consist of parts of the garment, or in some cases, the whole product that didn't reach the strict quality checks at the end of the production line. Often this can be due to minimal issues such as incorrect labelling, size errors, or faults in the stitch lines. Wastage can occur at any point and requires additional processes to get it back into the manufacturing process. As manufacturers have increasingly tight margins they find it more efficient financially to discard errors, maintaining consistent production speed, rather than slow up the automated manufacturing lines (Gunawardhana 2017:4).

Significantly, there are few verified statistics from this waste stream, however, research does suggest fallout is between 3-5% of all production (Aus, Gunawardhana 2017:5, 5), adding up to many millions of tonnes a year.



Global Material Flows for clothing in 2015 (Ellen MacArthur Foundation, 2017:37).

According to the Ellen MacArthur Foundation, of the 53 million tonnes of textiles that are produced annually, 12% of this material resource is lost through production (Figure 1), totalling 6.36 million tonnes a year (Ellen MacArthur Foundation, 2017:37).

Keith and Siles suggest that 15% of pre-consumer waste is disposed of by manufacturers in the fashion industry (2015:1053), which seems to highlight that data about leftovers retrieved from factories is inaccurate (Reverse Resources 2017:6). Drawing exact conclusions on wastage figures are challenging, but do highlight a significant virgin waste resource that is currently not utilised in any great volume.

To add complexity to the issue, traditionally many manufacturing facilities sold seconds on to local markets to remove the waste from the facility, while receiving income from the otherwise redundant product. However, as we have become increasingly global, brands are concerned about devaluing their reputation and consequently have placed strict brand protection on the stock (Gunawardhana 2017:2:1) This has halted the re-sale of fallout and has resulted in

more waste overall. Consequently, many manufacturing facilities have been forced to dump or incinerate fallout as a brand protection strategy (Cassidy and Han 2013:155), resulting in many cases of whole garments with only very minor errors being destroyed. Much of the incineration can take place in situ and is unregulated, posing further human and environmental risk factors. This perhaps explains why it is so difficult to gain data and therefore an exact understanding of the volumes of fallout currently produced.

To foster change, both the manufacturing facilities and brands must start to recognise and acknowledge this fallout waste stream and revalue it as a resource - identifying and enabling new methods to reutilise it. They will need to work on the problem together.

Brands need to understand the consequences of their processing methods and have greater accountability for the fallout along the production line. By understanding the impact that brand protection restrictions have on the manufacturers and the systemic issues it has created, greater awareness can help highlight the issues around fallout which can then start to be tackled out in the open. By enabling manufacturers greater flexibility

with the fallout, novel systems could potentially be developed separately from the primary production line, to utilise this material. The significance of this would result in less virgin material required for production overall, less waste incinerated or dumped in landfill facilities and potential revenue created from fallout.

This critical moment in time has further reinforced the conviction that understanding, utilising, and resolving some of these problems are more important than ever.

As issues with mass production systems have come under the spotlight during Covid-19, we are beginning to understand the opportunities ahead for remodeling the way we view fashion supply chains to create a sustainable fashion and textile industry for the future.

This research forms part of my wider PhD research that seeks to create methods of remanufacture for whole product fallout from the production line. Coming from an industry background, I have been able to use my experience as a practicing designer, to work on design solutions that could minimise the amount of waste 'fallout' seen, offering alternative routes for this currently redundant material resource.

## Notes

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Remanufactured t-shirt made from production line fallout, Photographer: Rebecca Russell Turner.



Remanufactured t-shirt made from production line fallout, Photographer: Rebecca Russell Turner.

# Hair and Now

## An Interview with Sanne Visser

Sanne Visser is a recently enrolled PhD researcher at the Centre for Circular Design: she a Material Design Researcher who works and lives in London. She graduated from Material Futures at Central Saint Martins in 2016. Her main interest as a Design Researcher is material innovation, sustainability and future thinking. The production process is highly important in her practice, where craft meets innovation and systems design. Sanne is mainly recognised for her ongoing research investigating the potential of human hair waste as a new resource.

**BECKY:** You have been working with human hair. Can you tell us about your research questions to date; what is behind the desire to use human hair and what have you been finding out?

**SANNE:** The main research question that I started my research with in 2016 questions the use of human hair: How can we utilise human hair waste in order to create new materials and product design? By this means,



Close-up of prototype fishing net blended with human hair rope, as part of the research project KNOT. KNOT (2019) investigated the potential of human hair waste in the pursuit of sustainable fishing gear.

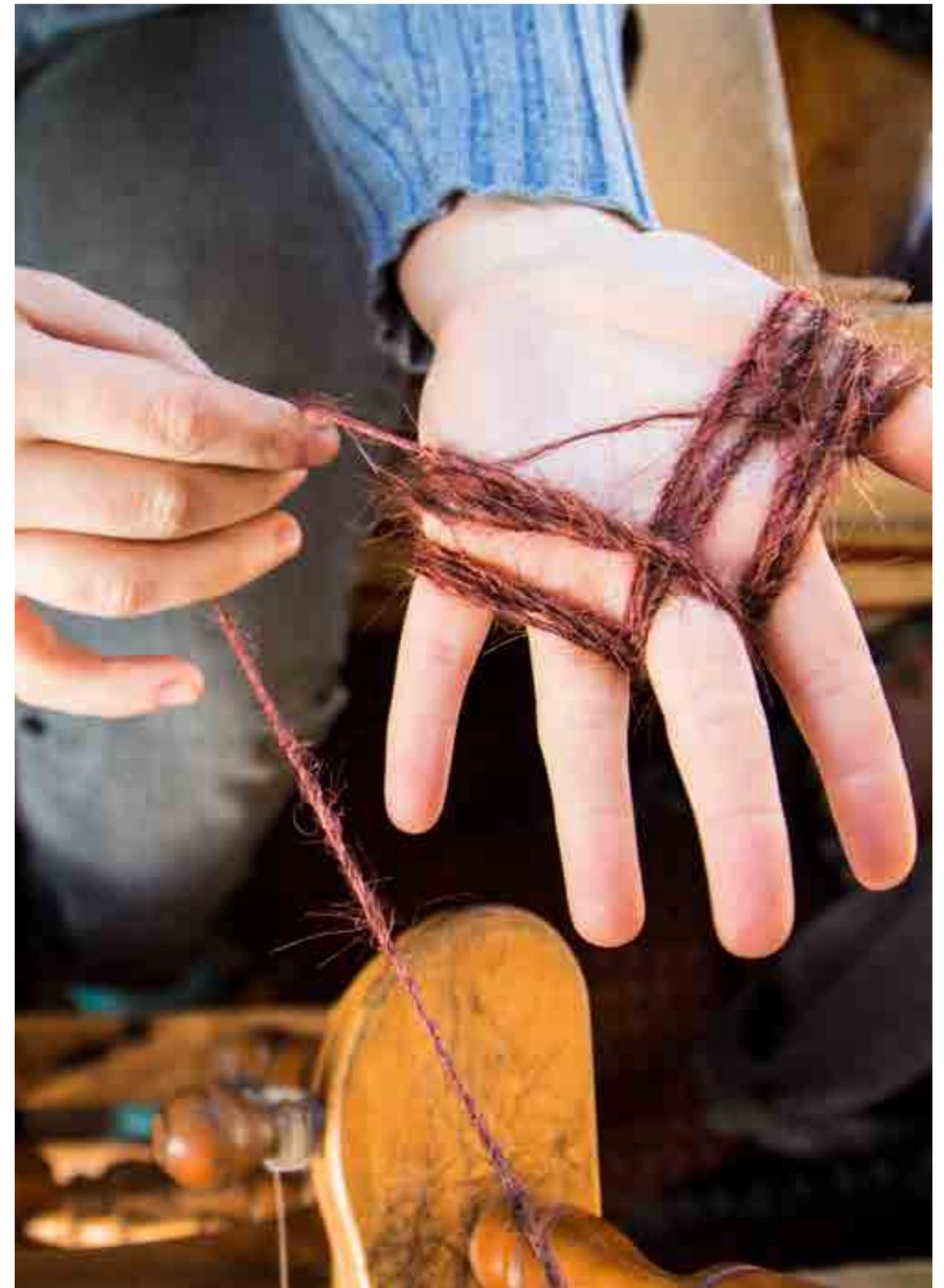
it focuses not only on the creation and production process of newly formed materials like yarn, rope and/or composites, it also investigates the system around human hair and its connection to human society.

I have found through research that there is an abundance of human hair waste created globally each year, which continues to increase due to the rising world population. This causes several problems for both the environment and human health, releasing toxic gasses and choking the drainage system.

However, human hair has many valuable properties; it has a high tensile strength, is thermally insulating, flexible, oil-absorbent and is lightweight. So, the question is, why aren't we using this wasted material or re-designing the system around it?

**BECKY:** What are you hoping to explore in your PhD project? How are you intending to progress your ideas, through both theory and practice?

**SANNE:** The practice-led PhD research I will be undertaking is concerned with the design and the recycling of human hair waste to provide solutions towards a more circular bio economy. The research aims to understand the current limitations as well as innovation opportunities for the protein fibre industry and the utilisation of human hair waste. New material outcomes, applications and systemic models will propose, through using design research approaches, how we might close the loop of human hair waste.



Human hair waste spun into 2-ply yarn by professional spinner Diane, as part of the research project The New Age of Trichology (2016-present).



Asian Human hair.

Theoretical frameworks are used to support the design research, and include emerging methodologies such as applied Design Driven Material Innovation (DDMI) (Tubito *et al.*, 2019). Reports from the Ellen McArthur Foundation and knowledge from various experts on the Circular Economy (Charter, 2018) will be examined to further inform the research towards implementation of closed loop systems and enhancement of circularity for the bio economy. Since I will be taking a practice-based approach (Vaughan, 2019) action methods will be required with hair industry professionals, trichologists, local hairdressers, waste management and hair product manufacturers (i.e. wigs/extensions). This will be combined with field research (DeWalt, 2002) i.e. visiting experts in the field of advanced materials, composites and technical textiles. Theory based knowledge will be gathered through qualitative analysis, data collection, articles, reports, interviews and photo/video documentation. Product performance testing and analysis methods will be employed using nearby testing labs at the University and other technical testing facilities.

**BECKY:** It's very early days for your PhD project - what excites you most about undertaking this challenge, and what scares you (if anything!)?

**SANNE:** Everything and nothing scares and excites me at the same time. I am extremely excited to start my research on an academic level, at a renowned research centre in the industry, under the guidance of my two supervisors. I look forward to learn more about circular design and research methodologies, in order to add new knowledge, develop ideas and bring industries together that otherwise maybe wouldn't have, i.e. Design, Trichology, Advanced Materials.

I guess I am slightly terrified for the unknown, of what I can't see coming. I am confident that with an optimistic, driven and ambitious approach this would only make the research even more exciting and stronger.

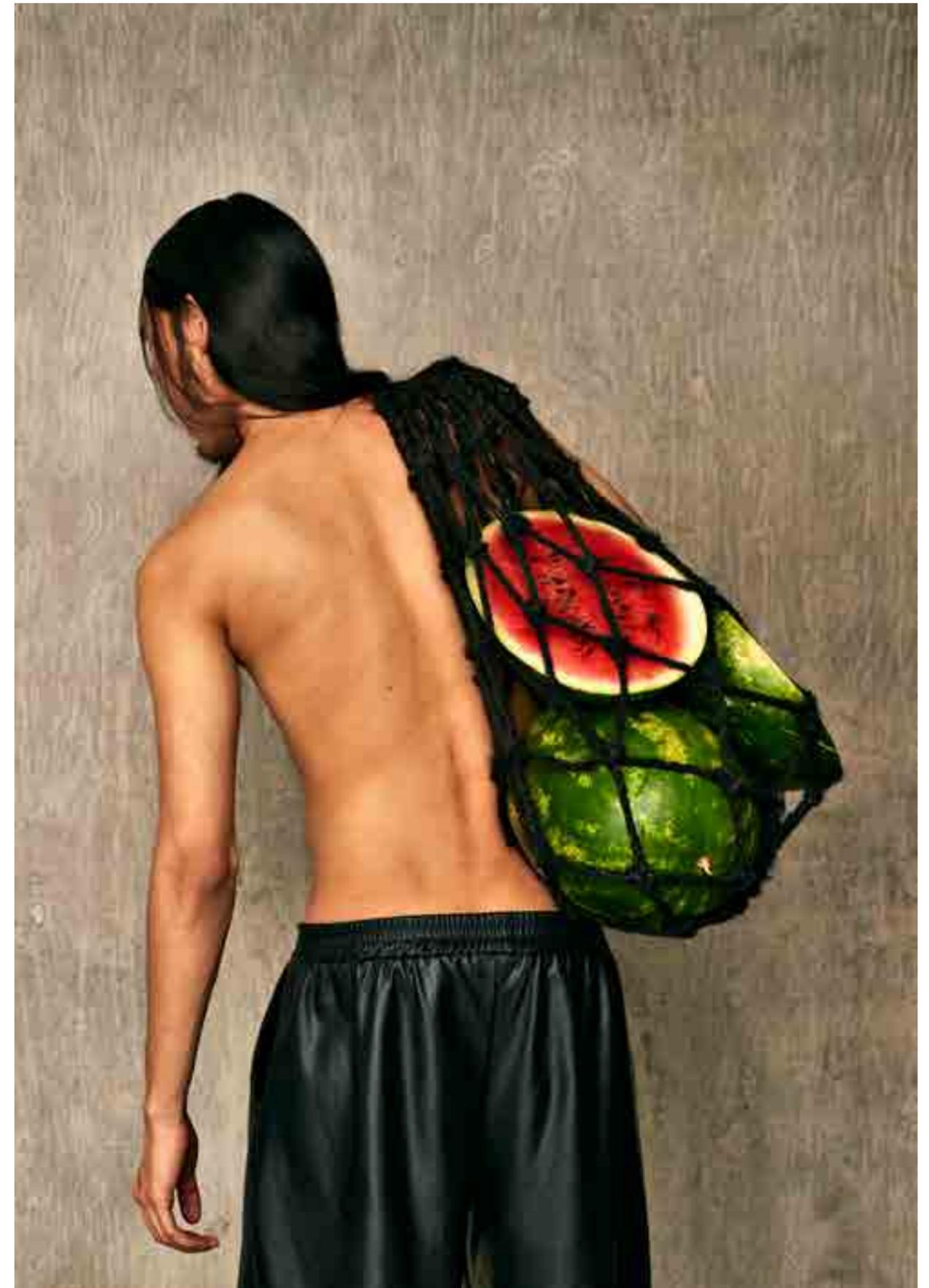
### Notes

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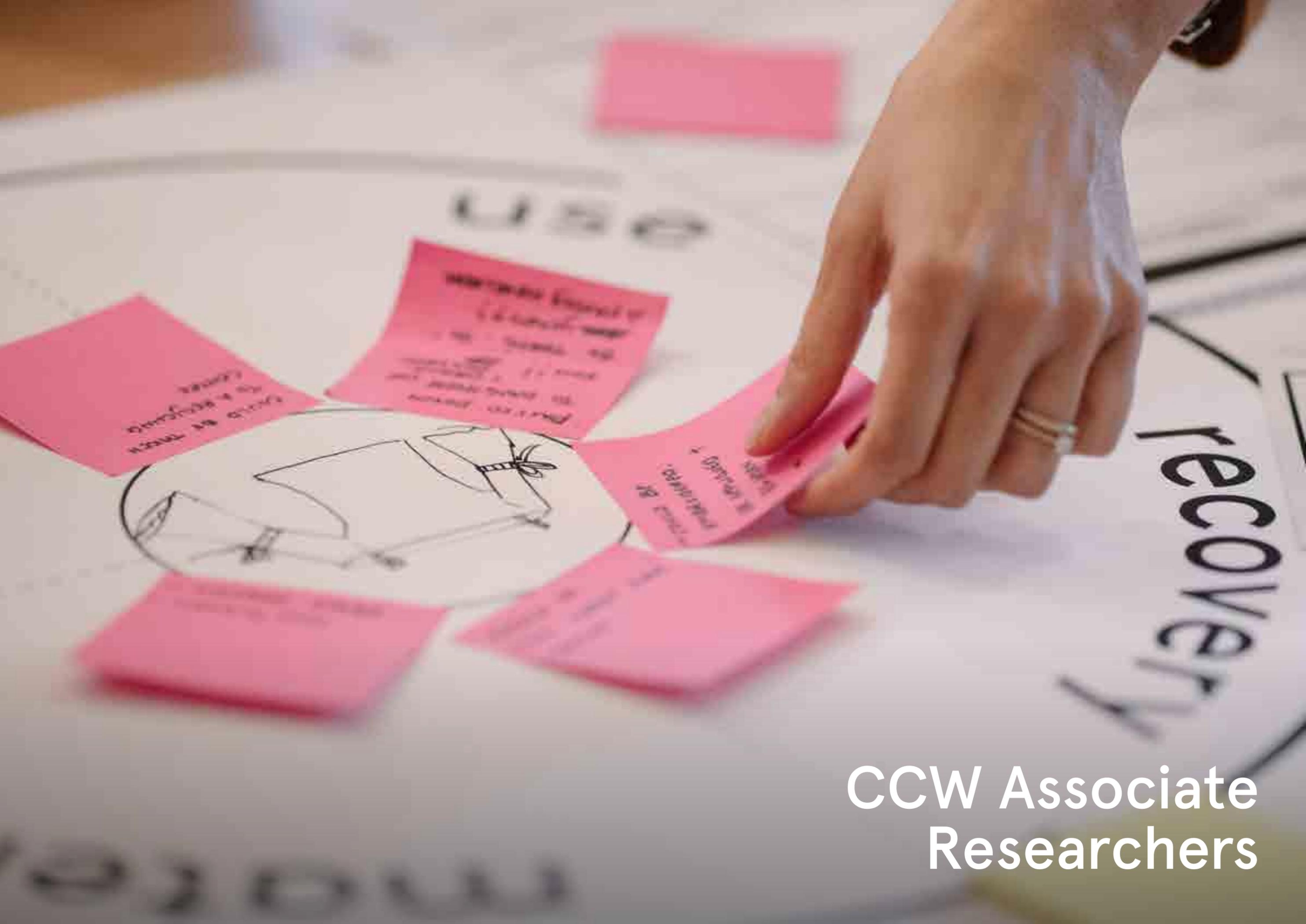
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Netted bag made from human hair waste, as part of the research project *The New Age of Trichology* (2016-present).



CCW Associate  
Researchers

# Geometry and Revolution

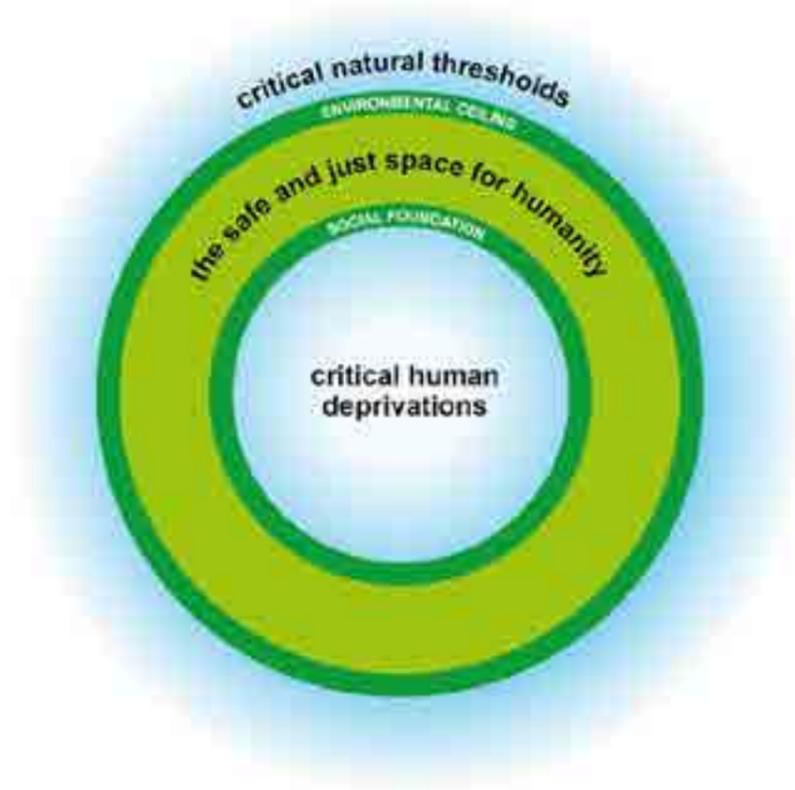
David Cross

David Cross is an Associate Researcher at CCD. He is an artist and academic actively engaging with the social-ecological crisis. He initiated a campaign for UAL to divest £3.9 million from fossil fuels, which in 2015 it pledged to do. With staff and students, he is now connecting creative practice, critical reflection and transformative action around the Climate and Ecological Emergency.

Identifying specific ecological thresholds, or planetary boundaries, Johan Rockström and a team of earth system scientists at the Stockholm Resilience Centre delineated "A Safe Operating Space for Humanity".<sup>1</sup> Building on this work, Kate Raworth added social boundaries to visualize a safe and just space for humanity,<sup>2</sup> through a diagram based on two concentric circles:

the inner representing a "foundation" of human rights, and the outer a "ceiling" of environmental limits.

This conceptual image brings formal clarity to the ethical project of eradicating poverty and ensuring equity, both social expressions of the aesthetic ideal of proportion. Yet as a representation of an abstract space between



Kate Raworth, 'A Safe and Just Space for Humanity', 2012.

the boundaries of different categories, it excludes the historical events and systemic power relations that drive the processes of political change over time.

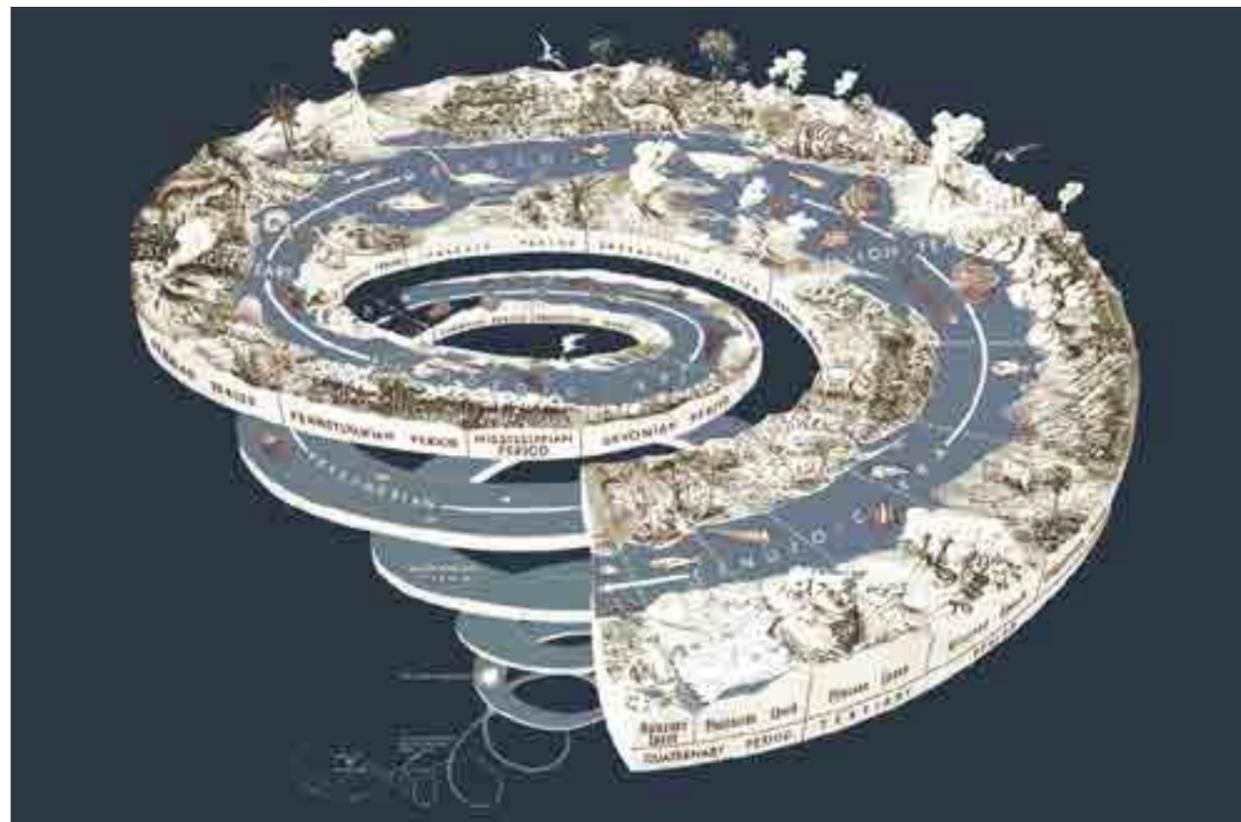
Slavoj Žižek identified three cultural forms of time: Classical time, with its eternal cycles of harmony in the universe; Modernist time, with its linear trajectory of progress, and Apocalyptic time, a parable of humanity falling into annihilation.<sup>3</sup> Though none of these seems adequate to the social-ecological crisis, perhaps there is potential in combining their cyclical and linear aspects to produce a spiral.

Joseph Graham, William Newman, and John Stacy's image, The Geologic Time Spiral begins with the origins of the Earth and grows upwards and outwards in a clockwise rotation. At the emerging tip is the Holocene, a period of climatic stability which enabled human civilizations to emerge, but which is now ending.

The span of geological time depicted includes past periods of ecological collapse and mass extinction, and its arrangement in a spiral aligns with the Darwinian theory of evolution as an iterative but irreversible process in a shifting relationship between continuity and change.

Such a spiral could reconcile classical time as an endless process of repetition, with modernist time as a linear movement from the past into the future. It could envision the Anthropocene, a proposed epoch marked by the geological signal left by human activity. As ecological collapse accelerates, reflexively connecting natural and social history could equally warn or confirm that apocalyptic times are approaching.

The exponential curve on graphs of rising consumption, greenhouse gas emissions, ocean temperatures, and species extinctions is a defining image of the ecological crisis.<sup>4</sup> Yet although endless economic growth is exceeding planetary boundaries,<sup>5</sup> human ingenuity has been able to delay systemic breakdown by mitigating some impacts and adapting to others. This dynamic interaction between social and ecological systems exemplifies the concept of feedback loops, which variously amplify or diminish cause and effect.



Joseph Graham, William Newman, and John Stacy, The Geologic Time Spiral, US Geological Survey, 2008.

But the catastrophe of fossil fuelled growth cannot be quantified in a cost-benefit analysis<sup>6</sup> or contained within a technocratic discourse of energy and resource flows. Disappointment followed the 2015 Paris Agreement; the 2018 UN special report on global heating of 1.5°C caused alarm, and the 2019 UN report on habitat destruction came as a devastating shock. Anger and grief flashed through the circuits of social media, shifting the frame of environmentalism from one of individual choices by consumers pursuing enlightened self-interest to collective action by citizens rising to the moral imperative of planetary survival. Struggling to recuperate the narrative, official declarations of Climate Emergency became standard.

Then, the Covid-19 virus presented a new symptom of the global social-ecological crisis. In the first phase of the pandemic, the destruction of biodiverse tropical forests allowed the virus to jump from wild animals to humans and livestock; industrial animal farming multiplied the virus, and jet travel spread it around the globe. The second phase hit the “developed” world, where the virus exacerbated inequalities of ethnicity, gender and class, interacting with precarious employment, and health and social care systems stripped bare after the 2007–8 financial crisis. The third phase of the pandemic is in the Global South, where the structural injustices of exploitation established under colonialism, and developed and expanded under neoliberal globalisation, are being cruelly amplified and compounded.<sup>7</sup> Yet while the pandemic has been driven by global capitalism, and manifested in the structures of neoliberalism, its effects include an historic disruption of the business cycle, destabilising assumptions about the role of the state, the value of care, and the potential for rapid change.<sup>8</sup>

The UAL Centre for Circular Design uses a Venn diagram showing social models, the self and mindsets, and material systems.<sup>9</sup> This relates strongly to Félix Guattari’s thesis of The Three Ecologies, which proposed social, mental and environmental ecologies as lenses through which to view the world.<sup>10</sup> Guattari drew on work by Gregory Bateson, who in the 1960’s and 1970’s had brought together insights from systems theory, psychology and anthropology to identify three interconnected networks existing at the scales of the human being, the society and the ecosystem.<sup>11</sup> Rather than treat these networks as discrete entities, Bateson focussed on the interrelationships between them. Guattari and Bateson share a conception of ecology that goes beyond concern for the environment to propose a materially embodied system of knowledge in which ideas evolve over time. Whereas Bateson’s understanding of nonlinear causality made him cautious about the unintended consequences of conscious purpose, especially when amplified through technology, Guattari’s abhorrence at the destructive and unjust excesses of ‘Integrated World Capitalism’ informed his call for politicized global resistance.

Today, as capitalism crashes through planetary boundaries and damages the social foundation, the task is not merely to increase resource efficiency or even to decarbonise economic growth. Rather, social and technical innovation must be decoupled from the accumulation of profit and re-oriented to achieve degrowth<sup>12</sup> and ecological regeneration. Also, the imperative of restorative justice demands engagement with the unsettling problematic of decolonization.<sup>13</sup> Achille Mbembe identified the racialized “Partition of the World”<sup>14</sup> dividing European civilization from territories marked for colonization. In material terms, the apparatus of “centre and periphery”—in which the privileged spaces of consumption are separated from the “sacrifice zones”<sup>15</sup> of material extraction, commodity production and waste disposal—must be disassembled, and its elements repurposed according to the wishes of the peoples who have been dispossessed.

Clearly, such vast ambitions are beyond the range of any society, much less any discipline. But by orienting its parameters at the planetary scale, and embracing the non-linear causality of compassion, solidarity, and joy, Circular Design could activate dynamic feedback loops, and catalyse an extraordinary potential for transformation.

## Notes

1 J. Rockström, W. Steffen, K. Noone, et al., ‘A safe operating space for humanity,’ *Nature* 461 (23 September 2009): 472–5. <https://doi.org/10.1038/461472a>.

2 Kate Raworth, ‘A Safe and Just Space for Humanity,’ *Oxfam Discussion Paper*, (February 2012): 1–26, 7. [https://www-cdn.oxfam.org/s3fs-public/file\\_attachments/dp-a-safe-and-just-space-for-humanity-130212-en\\_5.pdf](https://www-cdn.oxfam.org/s3fs-public/file_attachments/dp-a-safe-and-just-space-for-humanity-130212-en_5.pdf) (accessed 16 October 2020).

3 Slavoj Žižek, *First as Tragedy, then as Farce* (London and New York: Verso, 2009), 93.

4 See for example, <https://earthobservatory.nasa.gov/features/GlobalWarming> (accessed 16 October 2020).

5 For the concept of planetary boundaries see the Stockholm Resilience Centre. [www.stockholmresilience.org/research/research-news/2015-01-15-planetary-boundaries---an-update.html](http://www.stockholmresilience.org/research/research-news/2015-01-15-planetary-boundaries---an-update.html) (accessed 16 October 2020).

6 Andrew Stirling, ‘Environmental Valuation: How Much is the Emperor Wearing?’ *The Ecologist* 23, no. 3 (1993): 97–103, 102.

7 Commenting on disruptions caused by the pandemic to food supply chains, the World Food Programme warned, “due to the Coronavirus, an additional 130 million people could be pushed to the brink of starvation by the end of 2020.” See [www.wfp.org/news/wfp-chief-warns-hunger-pandemic-covid-19-spreads-statement-un-security-council](http://www.wfp.org/news/wfp-chief-warns-hunger-pandemic-covid-19-spreads-statement-un-security-council) (accessed 16 October 2020).

8 For a discussion of the potential for rapid transition to a post-carbon society, see the work of Andrew Simms. <https://www.rapidtransition.org> (accessed 16 October 2020).

9 See Rebecca Earley et al., *The Textile Toolbox: New Design Thinking, Materials and Processes for Sustainable Fashion Textiles*, *Project Report, Mistra Future Fashion*, Research Institutes of Sweden (RISE), 1. See <https://ualresearchonline.arts.ac.uk/id/eprint/11281/> (accessed 16 October 2020).

10 Félix Guattari, *The Three Ecologies* (London and New York: Athlone, 2000).

11 Gregory Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press 1972), 435–6.

12 See for example [www.degrowth.info/en/a-history-of-degrowth](http://www.degrowth.info/en/a-history-of-degrowth) (accessed 16 October 2020).

13 See Eve Tuck and K. Wayne Yang, ‘Decolonization is not a Metaphor,’ *Decolonization: Indigeneity, Education, & Society* 1, no. 1 (2012): 1–40. <https://jps.library.utoronto.ca/index.php/des/article/view/18630> (accessed 16 October 2020).

14 Achille Mbembe, *Critique of Black Reason* (Durham and London: Duke University Press 2017), 54.

15 See for example, Steve Lerner, *Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States* (Cambridge, Massachusetts: MIT Press, 2010).

# Designer Maker Mindset

## Maiko Tsutsumi

*Dr Maiko Tsutsumi is Course Leader for MA Designer Maker, Camberwell College of Arts, University of the Arts London. Tsutsumi's research and studio practice focus on the relationship between implicit knowledge and material-based practices, including: roles of material and human agencies, acquisition of skills, and language, in the creative practice, and how they relate with the creative thinking processes.*

The students visited the Tate's own roastery as part of the Power of Materials: Coffee project research, where they learnt about coffee production processes and stories of the coffee producers the roastery has been working with. The roastery also provided coffee brewing training and equipment for the students to serve coffee at the event (photo by Jane Wells).

In February 2020, a group of MA students from Camberwell College of Arts, University of the Arts London delivered an event entitled Power of Materials: Coffee at the Tate Exchange. The nature of the event – collectively developed by this group of students over a period of three months – demonstrates an application of the mindset that is discussed in this essay.



An overview of the Power of Materials: Coffee at the Tate Exchange in February 2020 (photo by Teeradech Panyasak).



MA Designer Maker students preparing part of the participatory installation made from waste coffee ground donated by the Tate Modern (photo by Alina Kosendiuk).

Responding to the theme Power set by the Tate, the students created an interactive and informative event with a narrative built from multiple takes on power that are found in the situations and relations around the production and consumption of coffee – one of the ‘materials’ that are around in their everyday lives that they chose to focus on. While the event highlighted the power imbalances that are rife in the coffee industry, the students also engaged with this project from a position that the distribution of knowledge as way to empower the consumers. Overall, the project provided insights into a larger and less visible part of the coffee production and consumption cycle, inviting visitors to engage with the stories that are part of this system. The idea was to research and present stories found from the whole lifecycle of a material at every stage, what influences them, and its implications to those involved.

The project presented a common mindset/ approach at multiple levels and a way of working through students’ engagement with research and dissemination, but also was a good example of how knowledge can be demonstrated and delivered through experience.

This essay also serves as reflection on an exploration of this mindset for design and pedagogical practices that is modelled on the approaches found in material-based practices, where agency of materials play a key role in development of ideas. I have identified that the intrinsic nature of this type of practice, exemplified in craft practice, where the material and the maker play equal roles as agencies in generating ideas and gaining insights that lead to creative solutions, offers a model for engaging with the real-ness of the world in finding solutions. Setting this approach as a basis of the MA Designer Maker course, I have been exploring ways to map out the key characteristics and enablers of this mindset.

The development of MA Designer Maker course in Camberwell College of Arts, which I have taught on since the start of the course in 2008, plays a key role in this exploration in the applicability of the material practice mindset to pedagogy. The commonality between the material practice and the course ethos has become more evident when the course went through a re-validation process in 2019, where the rationale was written more specifically based on this approach.



The students visited the Tate’s own roastery as part of the Power of Materials: Coffee project research, where they learnt about coffee production processes and stories of the coffee producers the roastery has been working with. The roastery also provided coffee brewing training and equipment for the students to serve coffee at the event (photo by Jane Wells).

Some of the key basis translated from the nature of material practice are: holistic understanding of the ‘material’ – i.e. the subject of investigation; receptivity to the material’s characteristics and behaviours; and prepared-ness to respond to the unexpected, including failures, with curiosity, viewing them as a new creative opportunity.

I have found that having these aptitudes when combined with design thinking facilitates greater resilience in students’ ability to persevere in their research and development of their specialised practice in broader perspectives.

Having witnessed this response, my observation is that this approach helps students engage more consciously with knowledge and information that exist in embedded forms. To further explore this view, I have held a number of discussions with the current cohort of MA Designer Maker students who were approaching the last part of their study, asking



Detail of the information screen as part of Power of Materials: Coffee at the Tate Exchange, made with hessian coffee bean sacks donated by Tate Roastery.



MA Designer Maker students working together preparing components of the participatory installation that consists of with waste coffee ground and devises they designed and built for the event.

them to define their understanding of the nature of the mindset the course encourages. The following are some of its characteristics that began to emerge.

Firstly, to be receptive to the 'material' that they are dealing with: be it a piece of wood, a person, an infrastructure, or a system. Secondly, to engage consciously with the feedback one receives while working with the 'material', with an open mind and understanding that all material constitutes a network of inter-relating things – and also that these relations shift in response to every intervention the designer/maker makes.

What has caught my attention in particular from the discussions with the students was that, adding to the above characteristics, their attention towards the mental state of the person engaging with their materials: it was mentioned that being able to pay attention to one's intuitive response while engaging with the material and the actions as an important factor in understanding the material. I would interpret this as an ability to tune into, and respond to, an intrinsic quality and state of their material that comes forth in the process of their engagement with it, instead of projecting preconceived ideas onto them. This speaks of the nature of the practice where learning is fundamentally experiential, facilitated by multiple senses and concurrent feedback and responses.

This observation suggests that the potentially significant role this mindset plays in drawing out information that are embedded, woven into the environment, actions and behaviours, that are largely implicit. The philosopher and the founder of the Deep Ecology movement Arne Naess (2008) once said,

“What we feel about something belongs to the qualities of the world as we know it. What does not have such qualities is abstract structure.”

I would like to propose that the ability to access and engage with this true, or lived, qualities of the world through developing the mindset discussed in this essay is key to gain deeper insights and understanding of one's research subjects as they really are, in order to offer creative solutions to a wider range of real-world issues.

### Notes

Arne Naess, *Ecology of Wisdom* (London: Penguin Classics, 2016).

Contact: [postgradadmissions@camberwell.arts.ac.uk](mailto:postgradadmissions@camberwell.arts.ac.uk).

Instagram: @ma\_designermaker, MA Designer Maker UAL website, <https://www.arts.ac.uk/subjects/3d-design-and-product-design/postgraduate/ma-designer-maker-camberwell>.



A young participant contributing to the participatory installation made from coffee ground (photo by Maiko Tsutsumi).

# Repair, Care and Politics

## An Interview with Bridget Harvey

*Dr Bridget Harvey is an Associate Researcher at CCD. She uses making to ask critical questions, generating new understanding and adding meaning through craft. Investigating processes and concepts through making, she asks what we make, how we make it, and why that matters. Since 2013 she has focused on repair as independent and embedded practice through her practice-based PhD, 'Repair-Making: Craft, Narratives, Activism', and a residency at the Victoria and Albert Museum.*

**BECKY:** What was your PhD question, and what were the key insights you ended up with?

**BRIDGET:** The PhD question overall was, what does mending mean now?

**What does repair mean now? I was asking that in the sense of being a maker, but also being a person in the world engaged with the politics, around environmentalism, sustainability, ownership, authenticity, things like that. It was a small question, but a massive one all at once.**

I ended up looking at it from three key perspectives. I was looking at the narratives of what we mend, how we mend things, what that communicates to other people; the stories we tell through the repair work that we do. Then I was looking at the activism around it, which is probably the easiest one to get a grip on in terms of there being a lot of people championing the act of mending as an act of sustainability but also as an act of ownership and saying, "No, actually I don't need to buy new. I shouldn't have to buy new." There's also a lot of people campaigning for legislative change to enforce repair within the design process that repair-ability.

Then the one that's probably closest to my heart was the last area which was looking at the craft of repair. Looking at it as a craft practice of its own, but also how it's embedded deeply within other

practices, and who the crafts-person of repair might be, and what the craft of repair might look like.

Those three key areas really gave me a way of focusing and choosing what I needed to look at and what I wanted to understand. I guess the other thing that led me to that, was an understanding of how we might think about repair before and after breakage: the idea of Repair-Thinking is how we might use certain aspects of repair as a, or certain ideas around repair as a gateway to prompt us to think about repair when designing things and when using things. It was broad but narrow all at once.

**BECKY:** There's another thing that really feels like a big change for me through your PhD, which is that before I would have seen making a shirt as my craft practice and that would have been something very precious and a particular act that I would aspire to be doing. Then I would see mending as a laborious task, that wasn't creative, that was a chore and not in any way aligned to, or the same as my making practice. But through your PhD I really understand now that to sit down and to mend can be equally as creative and meaningful.

**BRIDGET:** In a way it's a nice set of boundaries to bounce against and to explore within, I think, that you've got this thing that exists, you care about it for one reason or another enough to think, "Right, I'm going to mend this." Then you get to engage with it in quite a different way and it might be something that you've made yourself previously, it might be something that someone else has said, "Can you work on this for me?" I think it's becoming clearer and clearer that mending is important aspect of making now.



*A jumper to lend #2 (2015) found jumper, wool.*



*Blue bowl (2013) gifted bowl, glass beads.*

I think one of the differences between mending previously and mending now is that it isn't necessarily a chore. We do have the ability to just go and buy something new on the whole, obviously that doesn't apply to everyone and there are a lot of questions to be asked, I think, in the repair movement. To mend now is a choice generally, so actually if you're choosing to do it, then there are myriad of reasons why you might be doing it but it's unlikely to be because that's your only sock and therefore you have to keep it in service.

**BECKY:** You had the opportunity to become a maker in residence at the V&A Museum, can you tell us a bit about what you learned from that experience?

**BRIDGET:** The V&A residency is quite an off shoot from my PhD. I used it to focus on the questions around and the crossovers between conservation practices and repair practices. That is, how museums care for their objects and how we care for objects outside of the museum and what we might learn from conservation, which is a huge body of knowledge and isn't necessarily about repair. Some conservation practices might include choosing not to do anything to an object or just cleaning it, not necessarily actually fixing something, but there's so much knowledge there that we can draw from.

*I think in that nine months I really only just managed to scratch the surface, but what an interesting surface to scratch. I was privileged enough to spend a lot of time with the textile conservation team and talk to them about how they choose what to do and how they wash things and how they store things and all those kinds of maintenance practices, which don't necessarily get included in the repair conversation, but are huge parts of it. How we store our clothes, has a lot to do with how our clothes last.*

**BECKY:** Moving ahead then, so you've got this great body of work around repair and care and now you've finished your PhD. It's into the next era, the next phase now. Are you currently exploring new ideas around repair?

**BRIDGET:** Well, like I said earlier, I feel like I only really scratched the surface of conservation. I've been reading a bit more into that, although I'm slightly stymied at the moment because the libraries have shut. I'm also

just catching up a little bit, looking at what's going on around me. I've been reading books about flow and habit, and trying to understand our psychology more to try and understand the people aspects of things. Through my work, I've started to work out ways that we might talk about repair in a design sense, or we can talk about it in a practice sense or as a domestic practice with people who want to do it. But how do we get everyone else onboard, and how do we make it so it's actually really an automatic first choice action?

I am also looking at the other questions, one's more around conservation, maybe around emotional engagement and slightly spiritual engagement that people like Stuart Walker have talked about, with objects, with obsessions and trying to get a bit more of a grip on those.

**BECKY:** Yes. It's almost like with your PhD, you go deep, and then with the V&A, you went a little bit wider. Now, you're pulling out and you're going wider again and going, "What does this all mean and how do I want to apply it?" I agree with you, it's so often comes back to people at the end of the day, and wanting to connect in some of these really good methods and approaches and ideas and techniques that you've developed through your making, by finding the right way to work with people on them.

**BRIDGET:** Yes, exactly. I've got conversations going with makers, I've got conversations going that I can start to approach the industry sides with, but now how do I get people like my mum to do it?

**BECKY:** It's almost as if you have this bag of tools, strategies and ideas for your own practice as a craft person, as an exhibiting artist, and how you can help brands and then you have this other area of interest, which is actually, how you can communicate more broadly to move people, to move them into this space where they will want to mend and they will find the pleasure. Like you say, almost a spiritual connection when you sit down and you have a sense of completion and fulfillment. In a time like COVID, it's been really such a good time to do those tasks. I have to say, maybe I'm the fly in your ointment and maybe it's to do with the time of year, but I wanted to attack my mending pile and I moved it into the front room and I thought now is the time to do it. Then of course, the weather was so nice, so what I really wanted to do was go outside and garden. Maybe there's something to be done around seasonality, encouraging people to get through the winter blues?

**BRIDGET:** Yes, and also that sense of how do you put away your clothes for different seasons?. There's also a slightly anarchic spirit to it in that there's definitely anarchic sense to mending some ways, but there's also a slightly anarchic sense in not mending it and looking at something and thinking, "No, I'm not going to do that right now," that can be quite pleasant in a sort of naughty way.

**BECKY:** It's fascinating that in a way as the world falls apart around us or at least shape-shifts in such radical ways due to this pandemic, and to some respects, the impact of Brexit and our current governmental discord. Embracing the imperfect, embracing the mistakes, the holes, the fault lines, the things that have gone wrong is a really important way to find our inner strengths and to move forward with a sense of resilience about the future and what it's going to throw at us.

**BRIDGET:** Yes. Well, and a sense of independent thought is what I think need, we are sold or indoctrinated on this idea of perfection, and we need to embrace honesty around damage.

**BECKY:** In a time when we have cosmetic plastic packaged fast fixes arriving from China, it's even more key, to wear your mend like a badge of honour, almost like a medal, in the middle of this consumer war that we've got going on.

**BRIDGET:** Yes, exactly, but then equally you can have an invisible one. That's one of the things that I was really interested in with my V&A work, and I still am. It's this relationship between visibility and invisibility, where actually that an invisible mend can still be your kind of badge of honor, but maybe it's just a more private one. That's where it intersects with our ideas around privilege and want and need and all of those sorts of things, I don't mind a visibly mended item but I don't necessarily always want to wear one, but when I do I know that I'm wearing it because of what I feel are the right reasons, if you see what I mean. I also have a lot of clothes that I've invisibly mended and they make me personally still feel equally as empowered but maybe no one else knows that.

## Notes

<https://bridgetharvey.co.uk>.



MA Textile  
Design

# Wool Journeys 2020

Fiona Daly

Fiona Daly is a textile designer maker, handweaver and author from Ireland. Her practice is craft and research led, focusing on sustainable textiles, circular design, weave and education. Fiona completed a Masters in Textile Design at Chelsea in 2019, focusing on sustainable design, local wool production, use of rare sheep breed wools and weave design. Fiona worked as a Research Assistant at CCD on the Bilbao Wool Project (Autumn 2019).

## INTRODUCTION

My wool journey began many years ago, but in 2018 I began my MA Textile Design at UAL Chelsea and decided to formalize this journey informed by theories of circular design and through academic research. Wool as a fibre choice has many benefits. It is a low impact fibre from soil to soil (throughout its life cycle). It is fully biodegradable, durable, air purifying, a natural insulator, sound absorber, flame retardant, has elasticity and is renewable. (Campaign for Wool, 2019)

Yet, it is largely underused and has low value. As Fletcher states "For almost all countries, wool is a secondary product of sheep farming – the primary product being meat. As a consequence, sheep are rarely bred for the fineness and quality of their wool and as a result, the fibre, which tends to be fairly coarse, has low market value and is generally a wasted resource." (2014, p.14) This concern was a starting point for my research. Through my practice-based research I have demonstrated that it is possible to use a largely wasted resource of lower quality wool as a low impact woven cloth.

## MA JOURNEY

My masters research project 'North Atlantic Native Wool Fibreshed: Making a local, circular textile supply chain to create a low impact, sustainable cloth while also adding value and giving purpose to the wools of native Northern European Short-Tailed (NEST) sheep breeds' focuses on the breeds of Villsau (Norway), Faroe (Faroe Islands) North Ronaldsay, Hebridean (Scotland) and Manx Loaghtan (Isle

of Man). My concerns are the undervaluation and underuse in local wool production and their status as rarebreeds. I believe it is crucial to conserve these rarebreeds for genetic diversity and ultimately, biodiversity.

**My research project demonstrates a visible supply chain from flock to cloth, highlighting traceability of animal fibre. The outcome is a contemporary woven cloth collection of NEST wool. The suggested end-use is as outerwear fabrics, luggage fabrics or homewares, harnessing on the wools' qualities of waterproofing, durability and longevity, which is specific to the breeds in question.**

Among the factors which inspired this research is Rebecca Burgess' Fibershed Movement – creating a regional boundary for making a localised supply chain for fibre throughout its lifecycle. (Daniels, 2015) I am also influenced by the concept of 'bioregionalism' – developing sustainable products and services which are sensitive and respectful to a specific region (Fletcher, 2013; McGinnis, 1999)—and 'located-making': the development of purposeful goods whose design, production or use is dependent on place (Mullagh *et al.*, 2019).



Spelsau sheep flock, Lystbækgaard Farm, Denmark. Taken by the author on research visit, February 20.



North Atlantic Native Wool Fibreshed, author's research, 2018/19.



NEST Cloth Collection, 2019.

## CCD RESEARCH ASSISTANT JOURNEY

After graduating, while working as Research Assistant at CCD for the Bilbao Wool Project, I came across the same issue of wool wastage and its lack of value, in another geographical location - Bilbao. The project's purpose is the re-valorisation of the wool of Laxta sheep - a native, dairy sheep breed of the Bilbao region in Northern Spain. Currently, this wool is wasted and stored unused in a warehouse, sadly left to rot as this is deemed most cost-effective. The initial pre-report involved reviewing innovative wool research and projects globally. Co-written with Prof. Becky Earley, the pre-report looks at case studies and academic research across a broad range of fields including Agriculture, Luxury Fashion, Luxury Textiles, Health & Well Being, Construction, Packaging and Energy, with a diverse range of innovative techniques and processes concerning wool. From this pre-report a visual presentation was produced, as a precursor to a full report.

## DENMARK WEAVING RESIDENCY JOURNEY

In early 2020, my practice-led research with NEST wool continued, as I was awarded a weaving residency at Kunstkollektivet 8B in Denmark. I handwove a small batch production of three designs from my MA NEST collection, to be made into three coats. The cloth was woven with garments pre-designed to follow zero waste pattern cutting principles as closely as possible. I observed the same issue of wool wastage and undervalue while in Denmark, whereby the wool is burnt by farmers, as this is more cost-effective than collecting it for processing.



'Tiled Harpa' design in progress on the loom, Kunstkollektivet 8B, Denmark, 2020.



'Basalt' design, finished woven length.



'Tiled Harpa' design, finished woven length - detail.

## CONCLUSION

Through the journey of my MA and my post-MA practice, aspects of circular design have resonated with me. In particular, designing for the future through examining models from the past and creating localised supply chains to promote a local textile economy. My practice demonstrates that there is potential to utilise this resource of wool. It could be used as a resource model for producing low impact woven cloth, establishing local textile economies with localised supply chains, utilising a readily available and underused local fibre native to the North Atlantic region - wool.

## Notes

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Michael Vincent McGinnis, *Bioregionalism* (Psychology Press, 1999).

Louise Mullagh et al., 'Living Design. The future of sustainable maker enterprises: a case study in Cumbria,' *The Design Journal*, 2vol 22:1 (2019).

Deborah Robson and Carol Ekarius, *The Fleece and Fibre Sourcebook* (North Adams: Storey Publishing, 2011).

# Wipe-Away

*Kath Lovett*

*Kath Lovett is an MA Textile Design graduate (2019, Chelsea College of Arts.) She is a multi-disciplinary artist and designer whose work explores issues around sustainability, activism and feminism. She has developed a way of pleating non-woven wet wipes to make them more durable and withstand surface design finishes. Her work is embedded in the community and she is an experienced educator and workshop facilitator.*

Wet-wipes are a non-woven, single-use textile made from a mix of polyester and wood-pulp. It is a textile which has taken millions of years to form but is gone in a second; quickly disposed of and in large quantities. It is fabric used like waste paper.

I've personally used over 7,000 wipes during the early days of childcare and my MA work explored conceptual and environmental issues around the wipe.

Over a thousand pre-consumer-waste wipes from a wet-wipe factory were pleated, embroidered and naturally dyed. I developed a way of adding density to the wipes. It is a lengthy, meditative process involving feeding individual wipes through a smocking device. Each wipe is touched and counted, time being spent with the fabric as a stark contrast to my early consumption of the wipe. The use of wipes also hints at the hidden labour which takes up much of my day: of cleaning, tidying and shifting bits of cloth from one room to another. The wipe is a humble, almost invisible membrane in its materiality and the way we use it. They could be seen to embody care; they touch the skin with intimacy but as a way to control abject bodily fluids. They are an odd, ambiguous fabric which suggests both a barrier and a form of connection.

The pleated pieces are then dipped into dyes from waste materials from the home; used raspberry tea-bags, beetroot peelings and red onion dyes being the main source of colour. These are actually fugitives dyes, essentially stains, and the colour shifts and changes with time, as do all our lives.



*Craftivist group in action.*



*Craftivist group with embroidered blanket. Individual wet-wipes embroidered with messages, stitched together to form a blanket.*



*Heritages, 2019, Naturally dyed, embroidered and pleated wet-wipes.*



*Fluid Garlands, 2019, Naturally dyed and pleated wet-wipes with a video projection of pleated wipes floating in water.*

Some are embroidered with floral symbols suggesting fertility and pollination and also the possibilities which come from being in an undefinable state. Many flowers are hermaphrodites and although they are symbols of excessive femininity, they are actually harder to categorise, and vastly more complex. My textiles are fluid, tactile pieces which communicate the possibilities of a fluid, changeable body, where meanings are unclear and boundaries undefined.

Running alongside this fine-art/textiles practice was my activist work. Based on forming communities and gentle activism, I set up a group stitching activist messages onto wipes which were then sent to politicians asking them to ban wipes.

This was a gentle community action, formed around relationships and informal conversations. The slow act of hand stitched messages amplified the idea that wipes are more than single use textiles; they are strong, beautiful fragments of fabric. Throughout the MA I spoke to politicians, newspapers and the BBC about my work, stressing that this was a tender activism – unjudging but nudging new parents towards better alternatives to wipes.

At the time of writing, this work rises important questions around cleanliness, the significance of care and the power of touch.

The pieces are not quite textiles, not quite fine-art, nor activism, but hover between. By synthesising these practices, renewed meanings and ways of seeing were discovered. The highly altered surface of the wipe is now a thing of beauty.

### *Notes*

<http://www.kathlovet.com>.



*Fluid garlands, 2019, Naturally dyed, embroidered and pleated wet-wipes.*

# Ever-Me, Ever-Us

*Emma McGinn*

*Emma McGinn graduated with an MA Textiles Design at Chelsea College of Art in 2019 following nearly 10 years working in the fashion and textiles industry. She is a London-based textiles designer-practitioner, researcher and lecturer. She is currently undertaking a practice-based PhD at Lab4Living, Sheffield Hallam University, where she is researching how textiles craft practices might be used to explore alternative methods of engagement with vulnerable people.*

## INTRODUCTION

I completed the MA Textiles at Chelsea College of Art, UAL in 2019 after nearly 10 years working in fashion and textiles in various roles including commercial designer and undergraduate lecturer. Through my early career I always sought to make a positive impact, promoting sustainability both within my work and through teaching. Recently, after becoming detached from the making process, I felt the need to return to working with my hands and re-establish a regular studio practice. At this time, I was also beginning to consider how as a textiles practitioner I might make a positive contribution to the wellbeing of society through textiles.

## RETURN TO FULL-TIME STUDY

My return to full-time arts education opened up a period of soul searching for me; exploring personal memories and questioning my relationship with textiles and clothing. The support from the lecturers and the close connection the course has with the Centre for Circular Design (CCD), offered me a variety of perspectives through which to interrogate my textiles practice.

I had the opportunity to collaborate on a project called *Shirt Stories* with Professor Rebecca Earley (CCD). Through this project I created the *Ever-Me Shirt*, an ever-evolving work in progress that utilises slow, repetitive practices to record the passing of time and the layering of memory.



*'Tied up in Knots', 2020.*



*Many Memories' Chelsea Degree Show exhibition, Chelsea College of Art, 2019 (Photo: Kirsty Noble).*



*'Memory Book', 2019.*



'Collected Memories', 2019 (Photo: Kirsty Noble).



Work in progress – Wrapped, tied and clamped fabric, indigo dye vat, tools, 2019.

This project brought my textiles practice in line with my personal values. It reinforced a vision of the textiles practitioner-researcher engaged in the making process as a way to explore ideas and concepts.

### CRAFT-BASED TEXTILES PRACTICE

I work predominantly with natural materials including cotton and wool, and craft-based textiles practices such as natural dye, block printing, stitching and shibori.

*My studio practice has a ritualistic feel as I engage in the repetitive rhythms of layering, folding, wrapping, binding and stitching. Through textiles practice I explore critical questions; the process of making is a form of thinking through the hands.*

I translate craft practices into an appropriate language; the resulting artefacts become a non-verbal representation of my enquiry and exploration.

### THE PHD

Being exposed to the research culture at CCD I was able to imagine myself progressing to PhD study. With the ongoing support of the staff and researchers at Chelsea College and CCD, which extended beyond the MA and through to

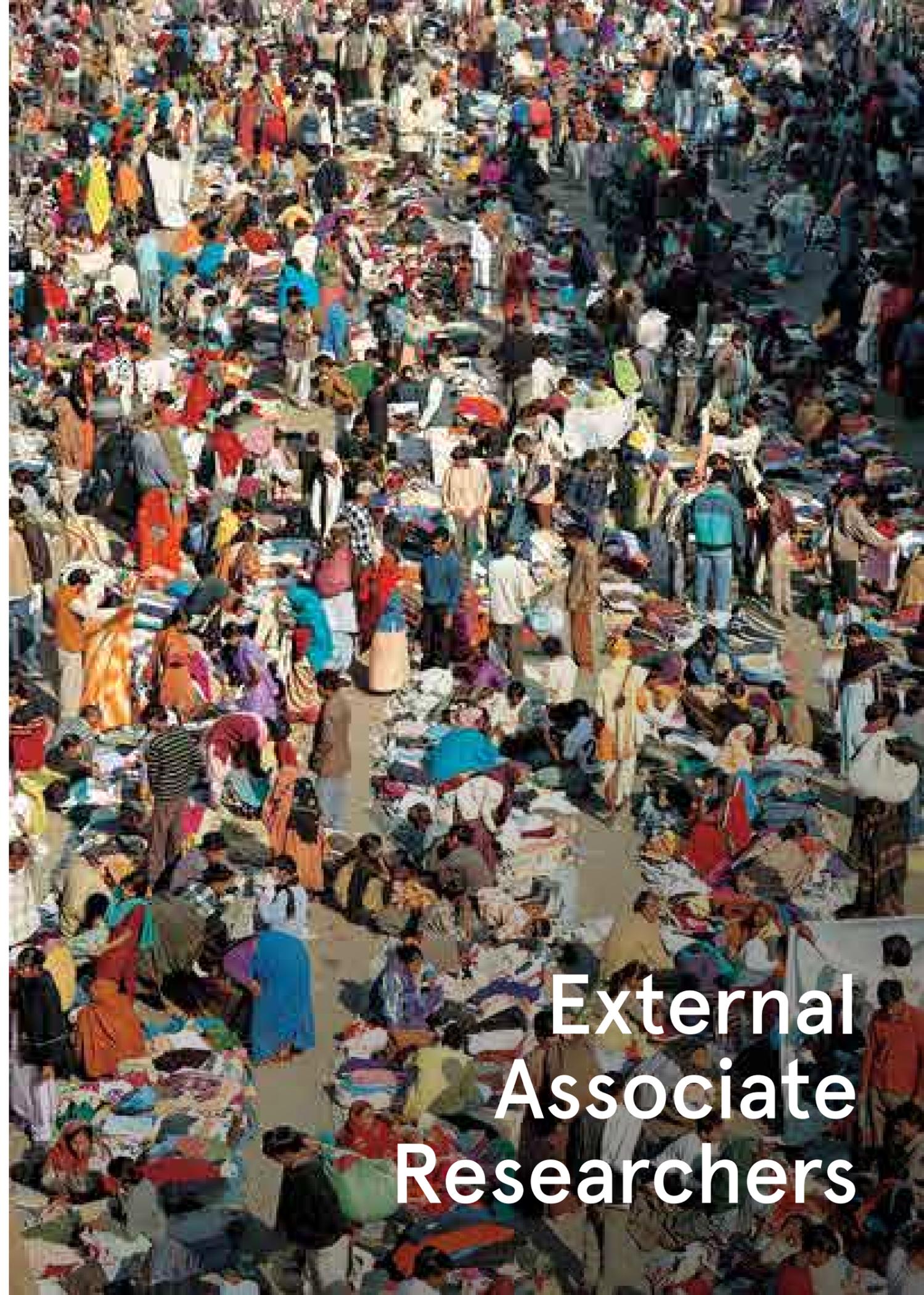
my PhD application, I secured a place on a fully funded program with Lab4Living at Sheffield Hallam University, part of their 100-year life and the future home project.

My practice-based PhD, which I started in October 2019, explores the concept of wandering and how the textile designer might create a space where exploratory, collaborative meaning-making can occur through textiles. I draw on textiles practice as both a toolbox for engagement and a lens through which to view my experiences.

My current project sees me working with participants who are living with dementia; exploring the notion of wandering and orientation through collaborative practice. Within my studio-based textiles practice I consider how interactions can either support or challenge the agency of a person living with dementia; exploring ideas around containment, boundaries and selfhood.

### Notes

<https://lab4living.org.uk>.



# External Associate Researchers

# Anthropology and Circular Design

## An Interview with Lucy Norris

*Dr Lucy Norris is a CCD Associate Researcher, Professor of Design Research & Material Culture at Weisensee Kunsthochschule Berlin, and Honorary Research Fellow, Department of Anthropology, University College London.*

**BECKY:** What is it that you do, and how did you first get involved with CCD? Why did you agree to become an associate researcher?

**LUCY:** I'm a social anthropologist researching the myriad ways in which our complex relationships with materials and material culture shape who we are, who we become, and the world we live in. I began working with anthropological museum collections, fascinated not only by the range of materials, technologies and forms fashioned in cultures across the world, but also critically thinking about the practices whereby collectors, archivists, curators and designers classify and ascribe value to certain things, and represent these back to us as particular worldviews.

I've always been interested in how we make meaning through textiles, and my original anthropological research in north India focused upon the lifecycle of clothing amongst middle-class families, their relationships with cloth, why and how they got rid of things, and what happened to them next (Norris 2010). I researched wardrobe practices and second-hand clothing markets for local garments, and through these I discovered a thriving industrial wool recycling industry importing Western cast-offs (Norris 2012). I started investigating the 'shoddy' industry back in the UK, and quickly made contact with Kate Goldsworthy at Chelsea, in what was then 'TED'. For her PhD, Kate was carrying out doctoral research into the potential to create new surfaces on shoddy fabrics as part of Becky's AHRC 'Worn Again: Rethinking Recycled Textiles' project (2005–2009) Early (2009). Becky, Kay and Clara were working with students to develop strategies for sustainable textiles, from choosing the right materials to pioneering upcycling techniques and finding the 'right path' for keeping cloth in circulation.

I'm now working at the interface of design and anthropology, whether it is thinking anthropologically about design processes or drawing on anthropological methods while helping postgraduate design students to find the most useful design research strategies for their projects and to critically reflect on the broader theoretical contexts of their work.

There is a lot of creative tension at this interface between different 'ways of knowing' the world, and when it 'works' it's a highly productive groove that opens up surprising perspectives on our (human) part in fashioning the world. I've moved from working with museum collections in London that give us the opportunity to model futures from our past and present values and beliefs, to in-depth participant observation of people's beliefs and behaviours in their daily lives in India, and I am now working with young designers in Berlin to shape sustainable futures. Altogether I think this makes for a deeper appreciation of how a mix of cultural, social, material and environmental factors are at the heart of creating circular economies, and how understanding our relationship with materials and the non-human world is fundamental to its success.



*A truck laden with imported used clothing brings these raw materials to the shoddy factories in Panipat, north India. ©Tim Mitchell & Lucy Norris.*



*Used clothing is manually disassembled by women using traditional vegetable cutters. ©Lucy Norris.*

**BECKY:** Looking back to Social Circles – the track we co-chaired at EAD13 in Dundee – what were the main ideas the sessions covered? What were the new insights that excited you most at the time? What do you think now, looking back on the track?

**LUCY:** The EAD13 conference track ‘Social Circles: sustainable communities’, which you and I co-convened, addressed the transformative potential of the social to design from a number of angles. We invited participants to think about the importance of social networks for designers driving systemic change, and discuss strategies to support and grow these coalitions and collaborations, including acquiring new skills, identifying expertise, and connecting different networks together. Beyond the social contexts of designers’ own practices, we wanted to look outwards to the role of designers in developing social innovation and behavioural change, more inclusive societies, equitable and just sustainabilities, and building local and regional economies that foster circularity.

We received a wonderfully broad range of proposals, and divided the track into six sessions, loosely grouped around areas including the production and consumption of fashion, co-design, disruptive business models, circularity and systems thinking, the role of traditional craft, bottom-up collaboration and speculative design as a tool for innovation.

Two sessions really stood out in my mind, those on fashion and speculative/collaborative design. The first, chaired by you, Becky, included papers on fashion activism in a London borough, zero waste design, cross-cultural divestment practices and design for sorting and recycling systems. The range of contributions demonstrated the maturity of thinking in the field of fashion and sustainability, how these designers are considering the broader implications of their work at every stage of their practice, and the thought-provoking discussion afterwards showed how fashion and textile research leads the field in critical approaches to the circular economy and systems thinking.

The last track, which I chaired, was very different in composition and approach, including papers on sustainable maker enterprises in Cumbria, developing storytelling spaces as a means of local empowerment in the Colombian Pacific, fostering local debate about community issues through design fiction in rural Germany, and design ‘for and from Autonomy’. The latter paper was an inspiring contribution from (UAL PhD student) Paola Pierri, drawing on anthropologist Arturo Escobar’s work, critiquing existing models of design for social inclusion and arguing for an overtly political design practice that makes visible that which is hidden, exposes conflicts and seeks to identify the root causes of social problems. It provided a challenging finish to a set of very diverse approaches, and we were delighted that Paola won the prize for best student paper at the conference. In hindsight, it was this paper that has stayed with me, reminding us to think critically, not to design out complex problems by telling a ‘single story of change and innovation’, to keep asking ‘why?’ until we reach the root of the problem, and to radically engage with politics on the ground.

**Design as a discipline needs to take power relations into account when attempting to understand complex problems and drive change, and admitting the limits of design on its own to enact social change on its own is a necessary first step.**

**BECKY:** Describe your perfect CCD project or collaboration?

**LUCY:** Being an ‘anthropologist-in-residence’ studying the design of circular systems as an example of what it means to be human possessing the intention to develop an ethics of care for the world as makers. I’d love to be invited to take part in a project that’s designing and working with new materials and finding sustainable strategies to keep them in circulation, by focusing my anthropological lens on all those actors involved in the process, living and non-living, especially the less visible and less vocal ones, and teasing out their complex relational interactions and inter-dependencies.

**Frameworks for thinking about emerging circular economies can, and should, be developed beyond designing materials, systems, and business models, understanding human behaviour, inspiring social activism, innovation and charging political contexts.**

Finding new ways of living with, and caring for, both living and non-living actors on this planet call for new understandings of ourselves as human beings in relation to non-human worlds, of de-centering our anthropocentric perspective, and of engaging with new fields of trans-disciplinary knowledge such as the critical posthumanities. Designers would be wonderful collaborators in such a project!

## Notes

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# Local, Redistributed and Convivial Narratives

Dr Marion Real

Marion Real is a systemic design researcher that explores social representations that occurs during transitions toward circular economies and cosmopolitan localism. She spent 2019 with CCD on the Mistra Future Fashion programme, supported by LDOC funding, where she researched the potential for convivial technologies and local production networks for different circular fashion speed narratives.

## WHAT DO I RECALL FROM MY LDOC EXPERIENCE AT CCD?

Envisioning new narratives for local fashion is about understanding and transforming territories. Coming from peri-urban regions of France, when you suddenly have the opportunity to integrate the LDOC program and work with the CCD's team members in London, you are suddenly absorbed in a mix of new cultures, new characters, new mindsets and expertise.

Circular Design was all around me, and I discovered many practices and visions. I was curious about building my investigation and looked forward to connecting with people and projects that would draw the story of my journey.

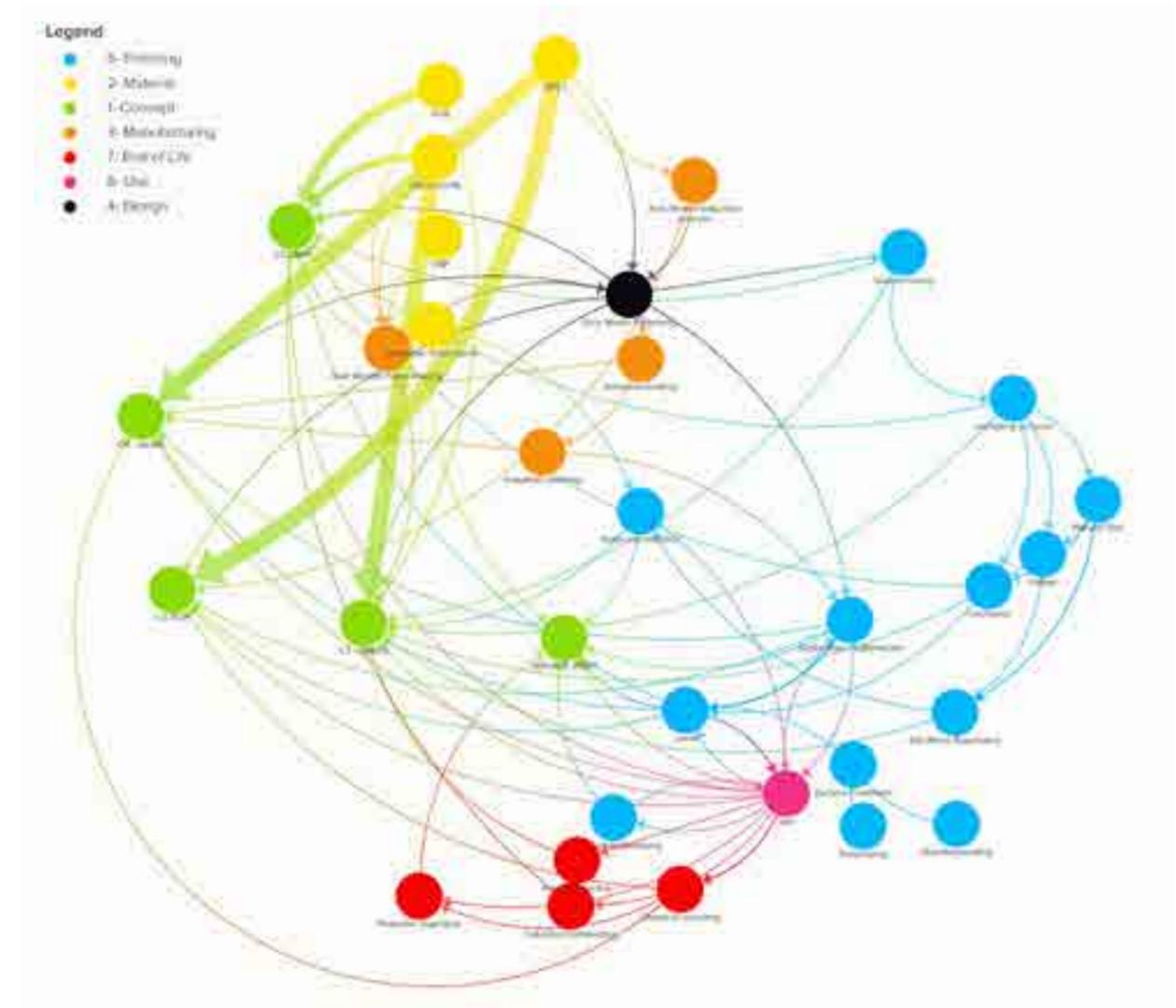
The LDOC experience was quite intense. It was not only about research. It was an opportunity for me to reflect on my career-path as a whole, thanks to special LDOC training workshops. I had the chance to run a research project with CCD on local fashion within the global network of the Mistra Future Fashion programme; and to build and support new relationships with French and Spanish ecosystems like the Chaire Bali and Fab Lab Barcelona, by co-organising a learning experience in London for them.

## WHAT WERE THE MAIN OUTPUTS OF MY PROJECT?

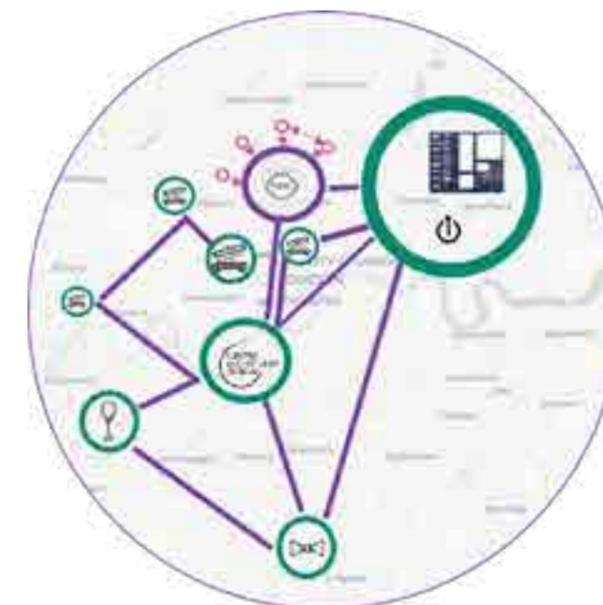
The main outputs I made during the journey of the project were:

- A typology of community-led initiatives for fashion and textiles.
- A framework "Practices, Places, Projects" to help designers to develop more systemic perspectives on the local narrative.
- A series of design tools and visuals that support designers in understanding where to look for capturing and situating the practice, sitting futures practices within local community-based initiatives in new local places; and to systematically assess the trade-offs and tensions behind each concept.
- A poster for the Mistra Fashion Future exhibition, Disrupting Patterns, that captured Becky's distributed and circular scenario for the Service Shirt.

(You can find the article published at the GFC conference summarising the contributions in the notes below.)



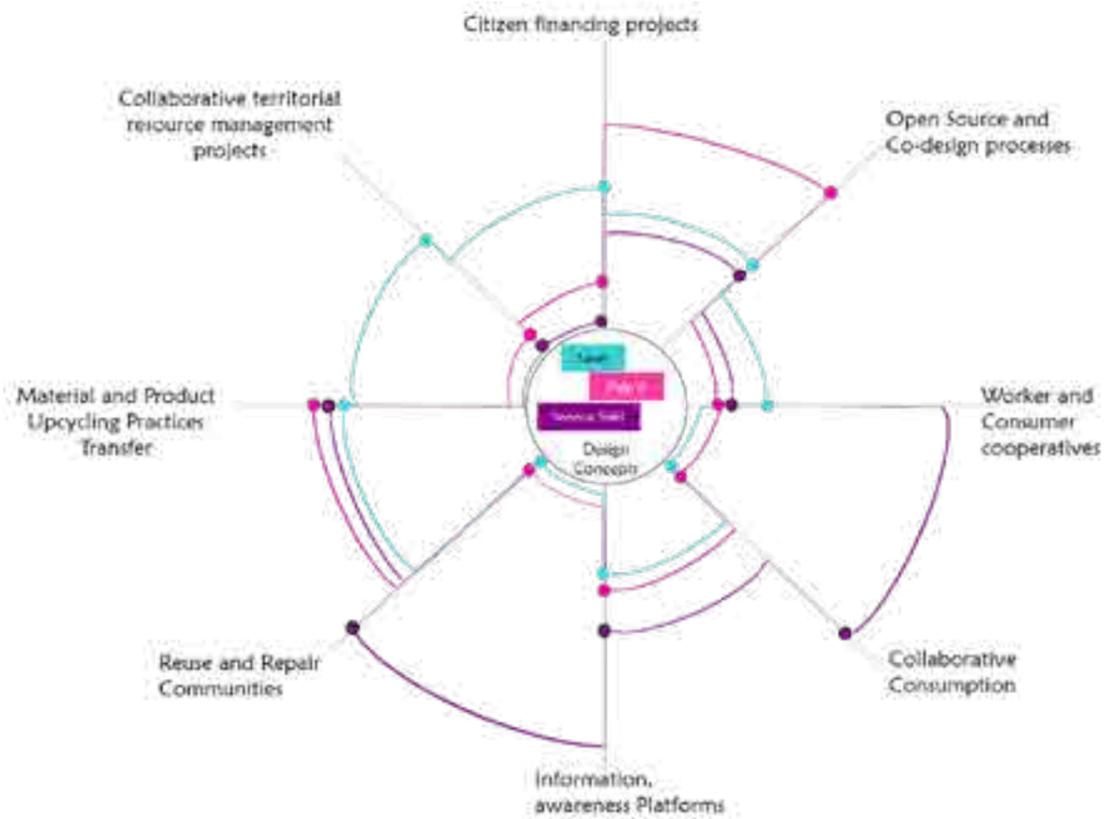
Complex Network of circular fashion systems.



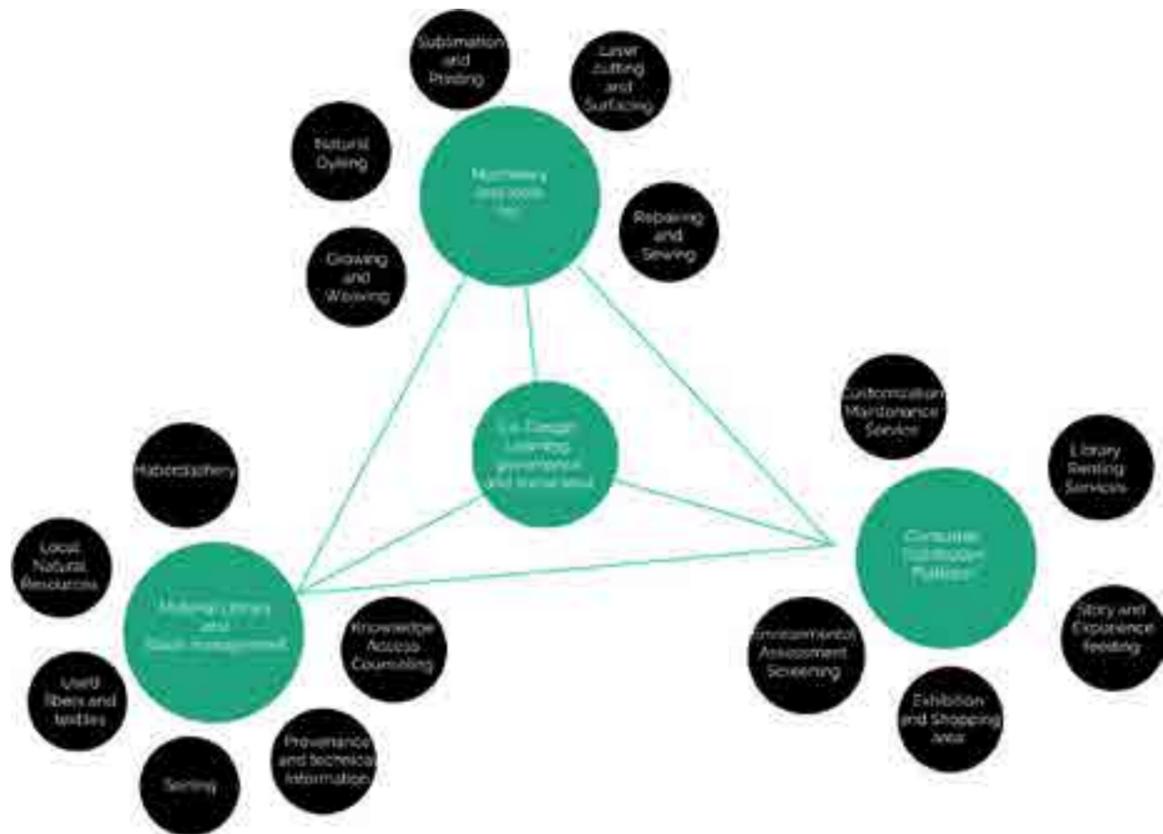
Circular Scenario connecting the local stakeholders and places in London.

## WHAT IS HAPPENING NOW AND HOW TO MOVE ONE STEP FORWARD?

I am still convinced that it is important to foster the development of small ecosystems that learn, design and start micro-producing and recycling locally, allowing territories to be more self-sufficient and resilient. We need to understand our ways and places of living and run transitions by practicing it, by engaging with territorial agents. We need people and infrastructure that facilitates collective investigations, knowledge transfer and the appropriation of new equipment.



Local community-based enrolling tool, applied to the CDS work, Mistra Future Fashion project.



Structure of a local re-makespace for the CDS work, Mistra Future Fashion project.

We need people and platforms to connect territories, to distribute information and knowledge. We need people and modes of governance to allow the debate of ideas and innovation to flourish by exploring the trade-offs, frustrations, contradictions and paradoxes which are behind our emerging futures.

This vision is clearly aligned with the objectives of what we are now building here at Fab Lab Bcn with the concepts of Fab City, Distributed Design and circular communities. I would recommend to explore the courses of Fabricademy, the Make.Works and TCBL platforms to support the development of more skilled and connected communities. By recently co-creating @circularbarris, a community who experiment with food waste collected in the district of Poblenou, we are realising how systemic and complex circular paths of transformation are.

**For me, what will be the most important from now on, is the long-term appropriation of circular production or craft practices at local level.**

We absolutely need people that dare to engage locally, married with these new practices and make efforts to sustain them and continuously improve their impact on the environment and society. (Our society needs design, creativity and exploration. But it also needs to stop constantly switching between approaches and start building and investing in concrete and real circular systems.)

### Notes

CircularBarris: <https://www.instagram.com/circularbarris/>; <https://www.facebook.com/circularbarris>.

Fabricademy: <https://textile-academy.org>.

Fab Lab Barcelona and global fab ecosystems: <https://fablabbcn.org/>; <https://fab.city/>; <https://make.works>.

French Chair Bali on disruptive materials and processes: <https://www.chaire-bali.fr/>; <https://www.estia.fr>.

London Doctoral Program (LDOC), <http://ldoc-cdt.ac.uk>.

Mistra Future Fashion, <http://mistrafuturefashion.com>.

Marion Real, Rebecca Earley and Kate Goldsworthy, 'Practices, Places, Projects: Enrolling Stakeholders for Circular Fashion.' (paper presented at *What's Going On? Global Fashion Conference*, London College of Fashion, 31 October - 1 November 2018), see [www.gfc-conference.eu](http://www.gfc-conference.eu). ISBN 978-989-54263-0-0. <https://ualresearchonline.arts.ac.uk/id/eprint/13859>.

SISCODE, <https://siscodeproject.eu/fab-lab-barcelona>.

TCBL: <https://tcbl.eu>.

Circular Scenario connecting the local stakeholders and places in London: <https://www.iconfinder.com>.

Complex Network of circular fashion systems: <https://kumu.io/misreal/convivial-textile-redistributed-manufacturing#places>.

# TED to TEDx:

## Transitional Textiles for Fashion Research

### An Interview with Clara Vuletich

*Dr Clara Vuletich completed a PhD in sustainable fashion/textiles through the MISTRA Future Fashion research programme at CCD in 2015. She is now an Associate Researcher at CCD, lives in Sydney and has several funded research proposals in development to investigate pre/post-consumer textile waste and end-of-life issues in Australia. She is a sustainability strategist and designer who uses design-led methods and creative thinking with brands, designers and consumers to create systemic change for a clean and ethical fashion industry.*



*How to Engage with Ethical Fashion | Clara Vuletich | TEDxSydney.*

**BECKY:** What was your PhD about? What made you decide to do one, and what kind of research did you end up doing? What were the key insights?

**CLARA:** My PhD was about new roles for textile and fashion designers in the transition to a more sustainable industry. I had been trained, like most textile designers, in the craft skills of designing, dyeing and printing of fabrics. I understood colour, aesthetics and materiality; and what fashion consumers want in terms of clothing and creative expression. But I had also become increasingly aware of the environmental and social impacts of the textile and fashion system.

After graduating from my BA in 2010, I had started working at CCD as a Research Assistant and was part of the team with Becky and Kay that developed The TEN design strategies in 2010 – a great framework for training designers to think about the big picture across the lifecycle of a fashion product and how to improve the impacts using creative thinking. We were working across Europe and the UK on sharing the framework with design students in higher education and had started to do consultancy work in industry – training design and product development teams. We were using training methodologies to help designers think about and do design differently – from raw materials, through to consumer behaviours during the wash and wear of garments to end-of-life. Even though it was a ‘blue sky thinking’ process that we led the participants through – and we weren’t involved in the actual implementation of the learnings in their company operations – we started to see that this type of training had the potential to be quite transformative for industry, brands and designers.

**But – and this is a big but – I started to realise that the roles and skills I had been trained in as a textile designer were not going to be useful or effective if I wanted to help facilitate systemic change at this level.**

I could speak the ‘language’ of fabrics and cloth that in many ways is the thread that links all the stakeholders in the fashion system – but this new type of work was demanding new roles and a new set of skills ‘beyond the cloth’.

Alongside this, in my own practice as a crafts-based textile designer outside of academia, I was working in quite activist ways, such as running workshops to upskill fashion consumers to repair their clothes. But again, I felt like I was just tweaking around the edges of the fashion system and my skills fell short of creating real systemic change.

Doing a creative PhD was never in my game plan! I had just been so grateful to have finally found my career calling with textile design and sustainability in my early 30’s. So, the opportunity to do a PhD was an added bonus. And because I was already within the CCD research and teaching culture and understood practice-based research it was a relatively smooth transition. But, that didn’t mean there was not a huge amount of uncertainty and stress about what my question was and where the research was heading!

The PhD was funded through phase 1 of the MISTRA Future Fashion programme (2011-2015). It was made up of eight different projects, across Sweden, Denmark and the UK, investigating how to make the Swedish fashion industry more sustainable while also maintaining its competitive advantage. It was a very rich and dynamic programme for all of us.

The title of the PhD was ‘Transitional Textiles: A crafts-based journey of textile design practice towards new values and roles for a sustainable fashion industry’. The question and nature of the research evolved as it went along and I ended up using three main methods. Firstly, I reviewed my own practice historically to see how it had evolved through engaging with sustainable design. Then I acted as a facilitator of industry training workshops with Swedish fashion brands, to investigate what new skills textile designers would need. And finally, I made a hand-quilted jacket as a form of reflection and to demonstrate the key concepts and insights in material form.

The key insights included the proposition that sustainability as a concept is nebulous, contested and does not account for the human or personal domain i.e. how we as humans relate to nature and ecosystems and how we develop values and mindsets that support pro-environmental behaviour.

**A more useful term instead of sustainability is ‘transitions’; referring to a process of change that needs to happen across all the domains of environment, industry, society, and at the human level.**

The transition that the fashion industry is currently going through is a complex challenge that will involve change and uncertainty and will produce a range of new design practices, business models and approaches to engaging with consumers.

To contribute to the systemic change that is needed, textile and fashion designers will need to work 'beyond the cloth' to activate and facilitate multi-disciplinary practices and become stewards of sustainable change across the supply chain and in local communities.

### I identified three different roles for textile designers:

1. The Sustainable (Textile) Designer
2. The (Textile) Design Facilitator
3. The (Textile) Design Steward

All the literature on transitions, systems change and sustainable design show there is a natural evolution from the base level of addressing technical and material aspects, through social systems (business models, consumer engagement) to the highest level of values and mindsets. True sustainability will only occur at the highest level of values and mindsets. The three new roles described above, follow this evolution to the ultimate role of the Design Steward.

In conclusion, the research proposed a model of new practice and set of tools called The Transitional Textile Designer, that include both the Inner and Outer aspects of sustainable change. The inner aspects include tools for self-development and reflective practice including meditation, journaling and a method for reviewing past practice. The outer aspects included The Green Cards, a tool for facilitating a values conversation amongst stakeholders in the supply chain and Sutra Stitching, a workshop that uses meditation and hand-stitching to facilitate conversation.

Interestingly, I had been practicing and researching all of this during and after the economic recession in 2008/09. I could see that certain things had changed, with society and culture becoming more values-based and more environmentally-aware. But, since COVID has happened, it has become really clear that what I was thinking about and proposing with the PhD research, is now playing out. My research into transitions as a time of uncertainty, and the new skills and roles we will start to see emerge in the fashion system, are very definitely on the way.

**BECKY:** With this experience behind you, what did you talk about in your TEDx Sydney talk? Why was this angle important?

**CLARA:** For the TEDx talk, I wanted to show that values and mindsets were the most important aspect to sustainable change in the fashion system. And I wasn't just referring to the values of consumers and their shopping habits – this was referring to everyone involved in the industry – brand owners, supplier factories, design teams and even people involved in clothing/textile recycling. And I wanted to tell the story of my journey through the global fashion supply chain. During the research I had travelled across a wide terrain, not just through the literature and in the development of new skills but also geographically.

**The journey had really started with me as a crafts-based textile designer teaching sewing skills to consumers in my local London neighbourhood of Brixton. It moved through the heart of the industry, working with fast fashion brands in Europe, across to engaging with garment workers on the outskirts of Shanghai in China and back to my home studio in London where I made a quilted jacket by hand.**

I looked at other TED talks and could see that although most people were talking about quite advanced, complex ideas from science, nature or psychology the best talks were always told using story telling techniques, and often with personal aspects from the speaker.

**BECKY:** How are you currently exploring these ideas and circular design in Sydney with brands?

**CLARA:** Since relocating back to Sydney in 2015, I have worked mainly as a consultant to fashion brands and retailers in Sydney and Melbourne. It wasn't actually my plan to work as an industry consultant – I had assumed I would continue in academia after finishing the PhD, but there was not the same research community or engagement in the field back in Sydney as I had seen in London and at CCD. I had also had a baby soon after I returned and wanted work that was flexible and project-based.

I guess I had built the confidence from my time using the TEN strategies and workshop methods Becky and I had developed during the Mistra Future Fashion programme. So, I adapted the workshop methodologies and started offering my services to companies. There are not many other consultants in Australia offering what I offer – using interactive training methods to educate, inspire and change business practices within fashion brands.

I work mainly as an external consultant with large brands, training teams and helping them develop an overall sustainability or circularity strategy. And I have also set up my own independent training course, the Sustainable Fashion Masterclass, which is aimed at small and medium sized brands or fashion industry professionals wanting to transition into sustainability roles.

**BECKY:** How is the industry in Sydney responding, what changes have you brought about or witnessed recently, and what can see you coming over the horizon in the next few years?

**CLARA:** The fashion industry in Australia has been slowly building up to engaging with sustainability and transparency. Over the last few years I have had increasing interest in my services but since COVID things have slightly plateaued! The main barrier to brands working with someone like me is fear. There is a lot of hesitancy – brands know they need to do something to show their impacts but often they just don't know where to start or what to communicate. A lot of the time my work is helping brands to audit what they are already doing and to tell those stories in a better way. Once they gain confidence, then we start to implement new strategies like sourcing better fibres or a customer take-back scheme.

The main impact of my work has been to kick start the conversations internally within companies. The workshop methods I use create a collaborative and fun environment for the teams to explore different approaches and start testing things out. After working with me, several clients have gone on to hire an in-house sustainability manager which is great as more and more brands are seeing this is now part of their core business operations.

Circular economy and circular design for fashion is definitely going to become more important for brands. Last year I ran a circular design training for a well-known brand here in Australia. And there is a lot of discussion amongst the industry about what Australia needs to support better end-of-life solutions for clothing, like better recycling systems etc. While the global industry is reeling from COVID, I believe we are going to emerge out of this with a renewed focus on sustainability and doing things better for people and planet.

### Notes

Clara Vuletich, 'Circular Soiree MS Teams interview,' interview by Rebecca Earley, 16 September 2020. See <https://circulardesign.org.uk/events/circular-soir%C3%A9-4-dr-clara-vuletich>.

Clara's website, [www.claravuletich.com](http://www.claravuletich.com).

Clara Vuletich, 'Transitional Textiles: a craft-based journey of textile design practice towards new values and roles for a sustainable fashion industry,' (PhD thesis, University of the Arts London, 2015). See <https://ualresearchonline.arts.ac.uk/id/eprint/12402>.

TED X Sydney Talk, <https://www.youtube.com/watch?v=WXOd4qh3JKk>.

# Zoom Circles:

## Curiosity, Trust and Good Vibes

### An Interview with Phil Hadridge

Phil Hadridge specialises in supporting groups working to achieve a social or public purpose beyond financial profit – whether meeting face to face or virtually. He helps leaders in various sectors develop their external facing partnerships and internal collaborations – connecting the people leading the many separate and sometimes competing activities and agendas.

**BECKY:** What is it that you do and how did you first get involved with CCD?

**PHIL:** I enjoy the opportunity to work with organisations in different sectors and around the world. The joy of the last few months has been doing that travel remotely and helping people with their individual thinking, but also with teams and groups of people together. I've been able to work with CCD for the last decade. I work with brands in the fashion and textile sector, and also in conservation and sustainability.

I really enjoy the opportunity to work in the fashion and textile sectors as I do in other sectors like education, drinks, airports – bringing people together who have a different point of view and helping people to pool their insight. I enjoy helping to run an event as an independent host, who's curious about how people are seeing things differently and trying to get a balance between conflict and collaboration. In the fashion sector, people from an NGO perspective, or from a union perspective can have really quite different insights to those working in a brand.

**I turn up offering three things: an independent viewpoint, time to devote to the project, and some capabilities – things I know from my previous experiences.**

**BECKY:** In a way you have to be incredibly open-minded and always listening and always interested. Are you really always interested, or do you ever find yourself switching off whilst you're in the middle of other people's conversations?

**PHIL:** I do experience a lot of internal clamouring when thinking around 'what's the next thing to do?' in a workshop and considering about where I'm going to take the group next. I've tried to train myself to be interested in what I'm not seeing, so it's a discipline, but not one that I'm always successful in. It also does make me quite an irritating friend because I'm not that interested in the standard view on the big issues of the day. I'm more curious about what else might be going on. What's not being reported, what's not being covered, and what's not being seen. WITOS – what is the other side. WAINS – what am I not seeing. IWI – in whose interest. WITF – what is the function.

Where people can have some radically different views and we end up with quite polarised debates and there may not be common ground. I'm quite keen to see where it is possible to align with people of good faith across political or theoretical positions and sometimes that is not possible. And this is where I think it links to design. For me one of the really big things in the design process is the insight, the participant observation, the empathy – trying to understand "where are people at?" If you're designing and making stuff for people, it's that engagement at a heart level and head level that really interests me.

**BECKY:** I think that we're just beginning on that journey really, talking to psychologists, user behaviour experts, anthropologists, about what it is people actually do and why they do it. How are people's behaviours formed and motivated and what can we draw back into design?

The second question I have is about how have you been working with CCD recently. Why did you agree to become an associate researcher?



Workshop method using old textiles to capture discussions about items from people's wardrobe, TED24 workshop, co-moderated by Phil Hadridge and Becky Earley (2012).

**PHIL:** I think the topic is so important. It gives me huge hope. I was influenced enormously by the speakers and the experience of co-facilitating the Circular Transition conference you and Kate produced a few years ago. Circularity is interesting to me from all the work that I've done in and around fashion and textiles. It is one of these areas where there is common ground.

In terms of the ways of working with CCD – that really excites me. How to bring a bunch of people together to work, to learn, to think, to exchange knowledge, to maybe challenge each other, to challenge themselves. Both the topic (circularity) and the way of working (collaboration) are key – both the anatomy of the area, but also the physiology of how it's addressed.

**BECKY:** Yes, which brings me to another question. As a group of textile and material designers and experts, when we have materials involved in these conversations, what is it that interests you about that? Where do you see our value as makers and designers?

**PHIL:** One of the ways that I've worked with you has been hosting your meetings. I have the independence that allows you as the researchers to be participants, while I keep things going during the

meeting. One early thing which we co-facilitated Becky was the TED24 event back in 2012 (Figure 1).

In the work that I do, I'm really interested in meetings and how do we engage people in a holistic experience? How do we run things which both stimulate us intellectually with our head, inspire our hearts but also give us practical things to do. And, how do we capture the insights learned with records and visual artists. The meeting in 2012 was a wonderful creative opportunity to try out a visual record of a meeting through stitching, through needlework, and through craft. I still think it was a stunning experiment that you and your team did with your skills and with your talents. It engaged people kinesthetically in the meeting. People came over to the stitching piece and contributed to it, but also it produced something as a record of the meeting which is fresh. I haven't seen this done anywhere else since, so that creativity there I loved.

**If there is no 'capturing' in a workshop, there is no chance of memory – and then very little chance to follow through, and so very little chance to completion.**

**BECKY:** What are the main ways we can work together online toward circular economy solutions? I know you've got a survey that you've been running with some of your network. Do you want to expand on that?

**PHIL:** Yes. I did the first round of the survey in early March with people from around the world and from a range of sectors. As well as the survey, it was supplemented with some interviews at the time. There are key themes that came out of it. People were actually a bit trepidatious, but also excited about the opportunity to meet in different ways because of COVID. There were three big things that could be achieved; public safety, addressing climate issues (particularly through reduction in carbon impacts) and also cost savings. What I see in the second round of research is that many people are so much more familiar with all the platforms now. It seems Zoom is a favourite for its ease and some of the embedded features that we can bring in easily. Also, other platforms like Miro, Mural, Mentimeter and Howspace are popular. People are very familiar with these solutions now – just a few months later.

There are some questions that folk have around trust development and I think that's really interesting for the work that is happening in CCD. When you don't know people, how do you meet together in ways that build trust? Often, we build trust by getting to know people, by going on a trip with them, by hanging out with them face-to-face in a workshop or having a drink or sharing meal. How do you bring some of those things into the online experience?

However, I think there are few major limitations in online working. And some benefits. When you see a screen of people – say you can see 10 people – you can see everyone in one gaze. You can pause, you can be silent, you can connect with each other in ways that people find really quite remarkable. Even quite deep, therapeutic work is being done online where people can connect with each other in ways that are really quite surprising. Also, features like the chat function are very powerful – 'chat' allows us to work through topics is really fast, much faster than it's possible in going around a group two or three times with the questions.

I'm very hopeful as we look to the future. I have a few hypotheses for further testing. One is that it takes two people to do the work of one. If we think of virtual versus face-to-face, it maybe takes double the amount of preparation to get ready for an online thing, but your opportunity is to reach double the number of people with half the amount of time in the actual session.

**I don't think we're at the new normal yet; we're not going to go back to the old normal. The pendulum is still swinging. I don't know where we're going to end up quite yet. It's a journey we're on, and I think a hopeful one.**

**BECKY:** We've been working on Microsoft Teams and teaching on Collaborate Ultra at UAL, and you've hit the nail on the head as I think a great loss with these platforms is not having everybody's face on the screen at the same time. I really miss that.

**PHIL:** Yes, I think the gallery view in Zoom is a remarkable thing. If you get people standing up together, sitting in silence together, looking at everyone for a moment, it can be really bonding. One thing to try is to give everyone a question and ask them to type their answers into chat, but don't submit till everyone's ready. Then everyone presses enter at the same time and you can read what people are saying and look at each other's reactions. These are things which I'm enjoying doing right now.

**BECKY:** We recently got awarded funding for a project by the EU called HEREWEAR, and it's all about making new fibres and materials from cow manure, straw, and seaweed, and then turning that into streetwear. We're part of a large group of people – think it's at least 15 different academic and industry organisations coming together, but we've never met. The first meeting is going to be in September, online. My question to



Clara using old textiles to capture discussions about items from people's wardrobe, TED24 workshop, co-moderated by Phil Hadridge and Becky Earley (2012).



Phil in the background, co-facilitating a workshop moment with Nick Ryan (Worn Again Technologies) and Monica Hundal (CSM). Chelsea, July 2012.

you is what would we do to replicate that joyful, serendipitous meeting that you have when you first bring people together? The conversation over the coffee that's often more meaningful than the five-minute presentation somebody has been asked to give?

**PHIL:** Invite people to bring along the beverage they will want at the end of the meeting for a 'social time'. I don't encourage people from Australia to turn up with red wine at the start of the session necessarily! But it is interesting what people have chosen to drink based on where they are in their day. It humanizes these interactions, making a thing of the difference. And it can replicate that sense of the random collision that you have in the coffee queue or who you happen to be sitting next to.

One of the other things that interests me is how to use analogue ways of connecting in the digital, online space. For example, you could send everyone who's going to come to your new research session in September a pack of physical stuff. Now, clearly you don't want to add more consumption of things in the world, but there may be a whole load of things you've already got, which you can put together in a box or a bag. Get people to work on a drawing together virtually or ask them to work with what they've got on their desks and show each other what they've made.

Also, not using electronic whiteboards and electronic voting, all of which I love, but actually getting people to write down on bits of paper and show each other

their scribbles/thoughts. Or, get people to stand up to use their hands as a signal of their opinion. All examples of how we blend in analog with the digital to encourage connectivity with each other.

**BECKY:** Great, we'll do that. The last question is to describe your perfect CCD project or collaboration...

**PHIL:** I've mentioned a lot about bringing people together and exploring things. In a meeting or project, a key feature I really enjoy for the impact is the use of 'max mix' design teams. There are a whole range of large group branded methods that have come out of North America, things like Appreciative Inquiry, Open Space, Future Search and World Café.

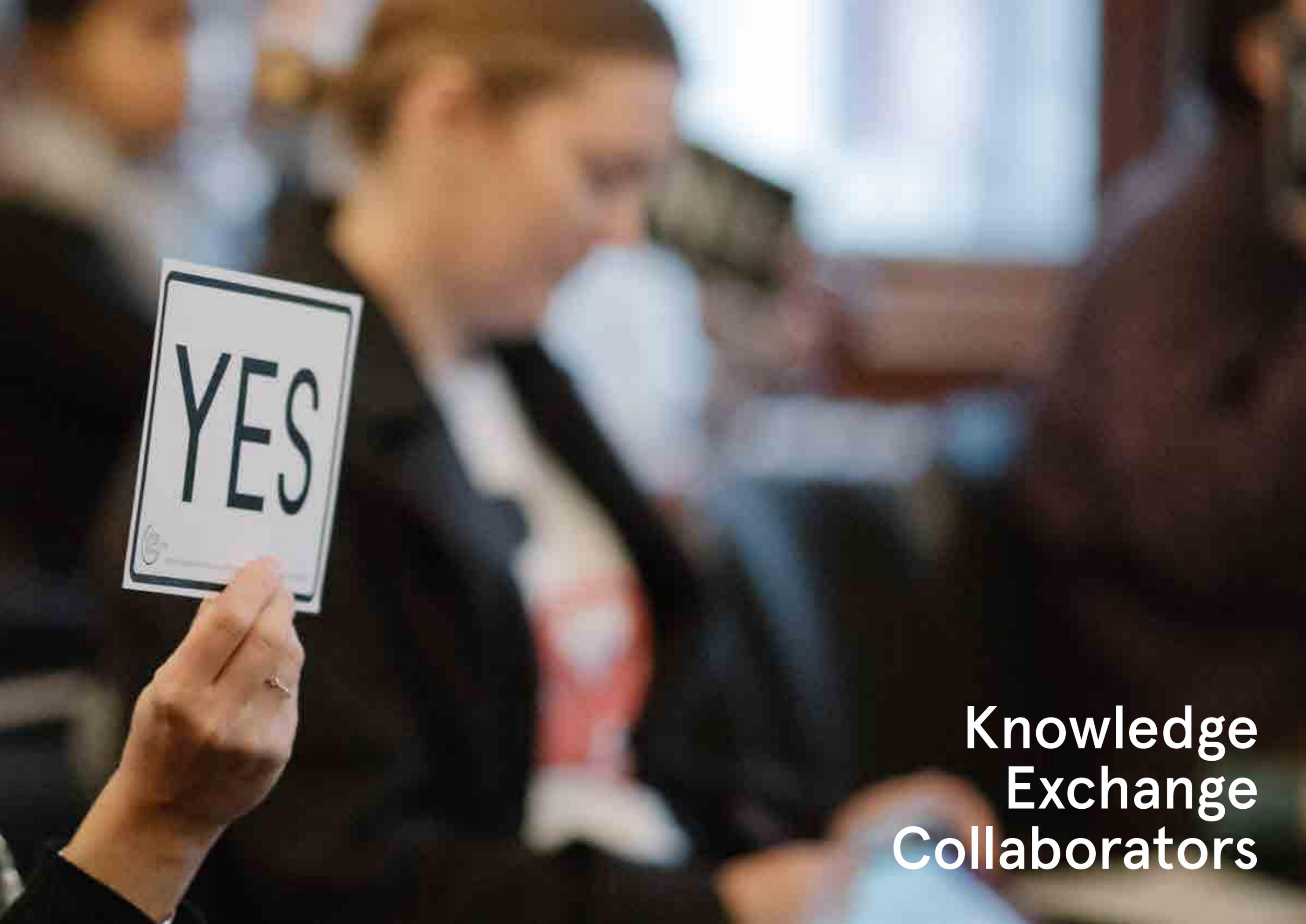
The common ingredient in many of these methods is the idea that you bring a small representative bunch of people together to plan what's coming up for a bigger group. It might be that a tenth of the people who are going to meet in a 100-person event will spend time beforehand thinking of how best to use the time. This is a group of people that can then be used as a reference group, in the lunch breaks for example. You can ask them, "How's it going? What do you think? How should we adjust the meeting?"

**When these groups are done well they have a diverse mix of people. You have people at different points in hierarchies, different roles, different nationalities, different technical skills, and critically, different levels of enthusiasm. You bring in the skeptics and the cynics, as well as the believers and moves. It's both the ideas from this design team initiative itself and the the quality of the relationships the scenes that is important.**

For me, the use of this type of design team is an ingredient that never fails to deliver. When a small group of people connects in that way, it paves the way for the wider purpose, a wider group of people.

## Notes

Explore Phil's ideas and tools for yourself via his website, <https://www.idenk.com>.

A person in the foreground is holding a white sign with the word "YES" written in large, bold, black capital letters. The sign is held up with their right hand. The background is a blurred meeting or conference room with several people seated around a table, some looking towards the camera and others looking away. The lighting is bright, suggesting an indoor setting with windows or overhead lights.

**YES**

**Knowledge  
Exchange  
Collaborators**

# Circular Design Speeds

## An Interview with Elin Larsson

*Elin Larsson is the program director for RE:Source, a strategic innovation program in Sweden that support innovation and research for sustainable use of materials within the planetary boundaries. Prior to that she ran Elco, an advisory hub for sustainability and circularity. Before that she worked at Filippa K for over 20 years.*

**BECKY:** What is it that you do, and how did you first get involved with CCD?

**ELIN:** I am now the program director for RE:Source; I could not resist the possibility to have an impact by using research and innovation to drive change. That has a lot to do with the fantastic experience I had with the Mistra Future Fashion project and CCD, whilst I was at Filippa K. I worked for Filippa K for almost 23 years, before I decided to take on another journey in life. It was 23 fun years where I learned so much and it was an exciting and winding journey with positions in several areas of the company; from Sales coordinator, Project leader, IT-Manager, Sales Support Manager, Logistic Manager to Supply Chain Director and finally ending as Sustainability Director – a role I had for almost 8 years. And that was when I finally found my true mission and what I aim to contribute to this world.

I am driven by a passion for finding sustainable solutions for business and society and for creating change together with people in the whole ecosystem of our industry.

Having being given the chance to work with sustainability really broadened my understanding of our fashion industry and the impact it has – both the good and the bad side. I have learned a lot of things about the whole life cycle of the products we create. Everything from the most extraordinary and beautiful objects, to the dark side of some of these products and the harm they bring to this planet.

**I am not a pessimist, quite the opposite in fact. I am a firm believer of the beauty of fashion. But I cannot stress the importance of a change in the industry – the whole industry.**

Pushing the boundaries of sustainable fashion is imperative, as is implementing those lessons and insights back into the business. And that has not always been an easy path – sometimes it feels like you are trying to push a mountain, that nothing happens and you almost lose hope. But then all of a sudden, something happens and you take a big leap forward. It might be a small obstacle that has been removed that leads to a greater change. I like to compare it with gardening – you plant a seed (an idea), and then you need to wait for it to grow and during that time you have to water and nurture it. And then one day, it will break through the soil and become the most beautiful flower.

And I think that description suits well for the collaboration we did with CCD. It was during my early days as the sustainability director for Filippa K that I first got to hear about Rebecca Earley and her work. I remember seeing her for the first time at Copenhagen Fashion Summit back in 2013 and I was totally star struck already then and I think that was when the seed got planted. After that I got to learn more about CCD and the whole fantastic team behind it with Kate Goldsworthy and Kay Politowicz and many more amazing people. But before we even came to that, I had a meeting with Rebecca in Stockholm some years later. She came to our office to talk about her polyester shirts and the



*Disrupting Patterns exhibition opening with (left to right) Elin Larsson, Jodi Everding, Emilia Castles, Professor Becky Earley, Dr Kate Goldsworthy, Professor Kay Politowicz.*



*Mistra Future Fashion Circular Speeds Workshop 2017.*

research of the printing concept she had developed over many years. She wanted to do a collaboration with us on that, and even though we loved her shirts and the idea of the project we could not fit it into Filippa K's way of working at the time or the Filippa K style.

But about 1 or 2 years later, when I was part of the board for Mistra Future Fashion, the right moment showed up and the seed starting to grow. We talked about the need for showcasing what a more sustainable wardrobe looked like and all of a sudden the slow polyester shirts from Becky as well as the fast paper products and techniques from Kate and Kay, all made sense and fitted well into Filippa K's way of working with Front Runners and circularity.

**Back in 2014 we developed the strategy, Circular Fashion. That was our guidance on how to transform to circularity and through that we were devoted to the four Rs, reduce, repair, reuse, recycle.**

Reduce was about the clothes that we create – how could we make them as sustainable as possible, creating no waste and be fully recyclable. To really challenge ourselves and create an understanding of what it takes to create products that are part of a circular business model and that can live up to our commitments for 2030 we have our front runners to show us the way.

Every second year or so we develop a few products to become front runners. Front runners were products that were made as sustainable as possible throughout the lifecycle. The purpose of those was not to create a separate collection but rather being a learning process for us, so that we could take the learnings from a journey with a front runner and implement them in our ordinary collection and work so that we step by step would get closer to our 2030 commitments – when all our clothes should be front runners. And it was within the concept of front runners where we found the perfect match with CCD and their research projects.

**BECKY:** What was the Circular Design Speeds project about?

**ELIN:** For us at Filippa K we saw a chance to have research guiding the way for our next front runner journey. And together with CCD take on the challenge to explore whether it is possible to create both slow and fast fashion and still being sustainable, and where we were to develop fully circular garments and looking at different speeds of fashion.



Filippa K - The Throw Away Dress - 100% Bio-based, 100% Biodegradable.



Filippa K - The Eternal Trench Coat - 100% Recycled, 100% Recyclable.

We all know slow fashion is good right? If you prolong a garment's life length with 9 months you can decrease the environmental impact with 20-30%. But what about fast fashion? In nature we do not define different speeds as good or bad. A butterfly that only lives for a few days are as important as the elephant that lives for 70 years, both contributing to the ecosystem.

And we would not want to be without the cherry blossoms right, even though they only last for a week. So, we challenged ourselves to look at different speeds and to develop a really slow garment as well as explore whether it is possible to design and produce clothes that will only last for short time. The researchers started out by asking how we design for durability and long life and that was the easy part. Our core philosophy is to make things that last a long time both in quality and style. But when they asked us how we design for short life it became really hard, because we don't and it goes against everything we do. The nearest we get to fast fashion is our lease/rental program and our second-hand concept where it is possible to do a fast or short update of your wardrobe.

But when we started to investigate wardrobe behaviours we realised it is a quite complex picture – where products that are designed to last for a long time might end up only being used once or twice and then thrown away – so is that slow or fast fashion? And polyester material that is largely considered a material for fast fashion is actually the slowest material of all. It takes millions of years to create, it is durable during use and it takes 200 years to biodegrade.

So, what did we end up with? The slow products being part of the technical cycle and made of 100% recycled polyester and being 100% recyclable – we call them the eternal trench coats – creating a circular life and a closed loop for our coats.

The short life product ended up being part of the biological cycle, made of 100% bio-based material and 100% compostable. We call them the Throw Away dresses. They are made of a non-woven Tencel material, so you cannot wash it – after a few times of usage, you put it in your compost so it can go back to the soil and become nutrition again.

The exhibition we ran together at Chelsea, UAL, as the ending of the project and to expose the results, was a true grand finale and when the seed fully bloomed.

**BECKY:** What do you think you learned from the project? What did the brand learn from it?

**ELIN:** What we learned during this project was that to be able to create fully circular garments that are part of a circular economy you have to start with the end in mind already at the drawing table. Will the product be part of the biological or technical cycle? And let the criteria for that steer your different design decisions and the product development. We had for instance a recycling company with us already during design phase to help us make the right decisions in order to get full recyclability. We also learned the importance of cross-functional collaboration – not only close collaboration with all parts of your value chain, but also to find new partners outside your conventional ecosystem as well as with academia.

**It was a true luxury to have research as a guidance. And what was unique with this project was that also the research partners were collaborating in new ways – different universities and institutes shared their knowledge and results in order to get a holistic view of what is the most sustainable option going forward.**

## Notes

Rebecca Earley and Kate Goldsworthy, *Circular design researchers in residence - a workshops report for the circular design speeds project with Filippa K*, Project Report, 2018. See <http://mistrafuturefashion.com/wp-content/uploads/2019/10/R-Earley.-circular-design-researchers-in-residence.-Mistra-future-fashion-report.pdf>.

<https://resource-sip.se>.

<http://mistrafuturefashion.com>.

<https://www.circulardesignspeeds.com>.

# Sewing Box for the Future

Jen Ballie, Meredith More, Becca Clark

Dr Jen Ballie is a PhD graduate from Textiles Environment Design (TED) whose research explores social innovation within fashion and textiles to re-think future practices. She is now a researcher at DJCAD, University of Dundee and Research Manager for the 'Design for Business' programme - positioned within the V&A Dundee - a Design Museum in Scotland. For this essay she has collaborated with Meredith More (Curator) and Becca Clark (Assistant Curator) at V&A Dundee.

## INTRODUCTION

There is such a systemic crisis of waste in the fashion industry that for individuals (especially consumers) it can feel completely impossible to do anything that will make a real difference. The figures are stark: around 1.1 million tonnes of clothing are purchased every year in the UK, with a value of £30 billion, but most of us only use 30-40% of the clothes in our wardrobes (WRAP, 2017).

Within a world of resource scarcity, ready-to-wear clothing bears the air of shop finish and finality and doesn't call for repair, alteration or unpicking. Further research is required to challenge this status quo and encourage healthier habits around how we care for, use and maintain our wardrobes in the future.

## SEWING BOX FOR THE FUTURE EXHIBITION, V&A DUNDEE

'Sewing Box for the Future' is a live research project and pop-up exhibition at V&A Dundee in partnership with the University of Dundee.

Using the idea of the sewing box as a metaphor, it raises awareness about diminishing sewing skills and explores what materials, skills and knowledge the public need to help them take proactive steps towards reducing fashion waste.



Sisters Zoe and Grace Fletcher learning new skills from project curator Dr Jen Ballie. Photographer: Julie Howdan

This project initially asked; how might we encourage the public to re-think clothing care, repair and customisation and what can be learned from framing this research as a participatory exhibition in an active museum?

The exhibition is organised around 3 themes - Care, Repair and Customise. Visitors are shown inspirational examples of best practice, as well as invited to take part in activities such as interpreting washing labels, darning, needle-felting and assembling modular garments at 3 activity stations.

Accompanying each station is an instructional card, which visitors are encouraged to take away - to try on their wardrobe at home.



Sewing Box for the Future Exhibition, V&A Dundee, Photographer: Tom Nolan.



Sewing Box for the Future Exhibition, V&A Dundee, Photographer: Tom Nolan.

# SEWING BOX FOR THE FUTURE

There is a crisis of waste in the fashion industry, but what can we as individuals do about it?

One thing we can do is devote more time and care to looking after what we already have.

This pack of cards includes some simple suggestions for how to extend the lifetime of your wardrobe, split into 3 themes: care, repair and customise.

Share your projects with us using: **#FutureSewingBox**

## CARE

Revitalise your wardrobe

Most of us only use 30-40% of the clothes in our wardrobes. Sorting out what you already own might give you ideas about how to make better use of it.

### HOW LONG DO CLOTHES TAKE TO DECOMPOSE IN LANDFILL?

A wool jumper 1 to 5 years	Cotton socks 1 week to 5 months	A silk tie 1 to 5 years	A wool suit with viscose lining 1 to 5 years
A mixed fibre wool jumper (51% wool, 30% alpaca, 1% polyamide) 200+ years	A viscose t-shirt 1 to 6 weeks	A synthetic gym top (70% polyester, 6% elastane, 4% polypropylene) 200+ years	A denim jacket 10 to 12 months
A denim jacket 10 to 12 months	A linen shirt 2 weeks	Ethylene vinyl trainers 1000 years	Biker leather jacket 25 to 40 years

Sewing Box for the Future - Sample cards from each theme, Graphics: By Young.

### SEWING BOX FOR THE FUTURE THEMES AND INSTRUCTIONAL CARDS

The care category encourages people to invest more time in looking after what they already have by giving advice on washing clothes and suggesting a wardrobe inventory. We are looking at different tools that be used within the home to maintain clothing such as; a clothing brush or sweater stone for depilling or a guppy wash bag to prevent microwaste. We also list top tips for nurturing 'care practices', and the card activity can also be used to interpret clothing care symbols.

The repair category empowers people to make repairs rather than discarding their clothes by focusing on mending techniques, such as; hole maintenance by darning and needle felting, sewing on buttons, and replacing zips. There is a mended sweatshirt by textile artist Celia Pym (2018) to demonstrate how darning can be visible, fun and part of the garment's story. We are looking at nurturing 'repair practices' by simplifying the process and offering instructional activities that can be sewn by hand. There are fewer repair shops on the local high street and clothing might be discarded due to a minor flaw.

The customise category shows how people can refresh their wardrobes with a little creativity. It includes instructions on assembling a modular garment, as well as hemming a pair of jeans and creating a bespoke embellishment. This section showcases modular garments by Post Couture Collective and an embellished denim jacket by Chloe Patience. We are looking at 'customisation practices' to empower individuals to adapt and personalise their own clothing. An additional card has been designed by Trakke (2020) to demonstrate how to make your own face mask by hand as face coverings are becoming a powerful symbol of self-expression.

## CUSTOMISE

### Assembling modular garments

Designers The Post-Couture Collective have created a range of downloadable modular garment patterns for laser cutting. These can be mix and matched to create unique looks and require no stitching at all!

In the Museum we have laser cut a skirt and T-shirt ready for assembling, but if you want to try downloading and laser cutting the patterns yourself, they are available for a small fee at [www.postcouture-cc/diy](http://www.postcouture-cc/diy)

#### What you need:

- Laser cut modular panels
- Laser cutter
- Measuring tape
- Computer
- USB pen

**Hint:** Makerspaces are open access design studios that enable members to access communal digital fabrication equipment. Often you can find help and support if you haven't used these facilities before. In Dundee, DJCAD has a Makerspace with laser cutting facilities.

Sewing Box for the Future - Sample cards from each theme, Graphics: By Young.

## REPAIR

### Sewing on a button

We might mean to do little tasks like replacing buttons but let them slip off our to-do list. This card shows you how to sew on a button securely, so your repair lasts longer.

#### What you need:

- Thread
- Button
- Tailor's chalk
- Needle
- Spare needle
- Scissors

**Hint:** A handsewn button is far more secure than a machine-sewn one. Some people use clear nail polish as a sealant to stop the thread unravelling.

# SEWING BOX FOR THE FUTURE

## FEEDBACK

This exhibition is part of a collaborative research project between the Museum and the University of Dundee.

Your feedback will help us further refine the Sewing Box for the Future.

Today I learned to \_\_\_\_\_

I'll use this to (i.e. darn/customise) \_\_\_\_\_

my (i.e. favourite jumper) \_\_\_\_\_

Tomorrow I pledge to

- Visibly mend
- Wash my clothing less
- Customise my clothing
- Wear my clothing at least **#30years**
- Gift or re-sell clothing I no longer use

In the future I would like to learn more about \_\_\_\_\_

Evaluation & Next Steps, Graphics: By Young.



Sewing Box for the Future Exhibition, V&amp;A Dundee, Photographer: Tom Nolan.

## EVALUATION & NEXT STEPS

As a live research project, Sewing Box for the Future has enabled ideas, as well as practical instructions and activities, to be tested in a busy museum with a captive audience. The impact evaluated using feedback cards, observational research and interviews.

The project has had to pivot in response to the Covid-19 global pandemic and is being re-designed to incorporate an interactive takeaway kit for visitors and online digital resources to support individuals to continue making at home. The evaluation will continue, however, and it is hoped the project may gain even more traction given the resurgence of sewing during lockdown.

Findings will be reviewed over time to develop community partnerships, as well as to expand upon the instructional resources and activities that have been prototyped in the museum, but that we hope will inspire different iterations of the project in other settings that help to further refine the Sewing Box for the Future.

## Notes

Instruction cards: By Young, <https://www.byyoung.co.uk>.

Sewing Box for the Future is a pop-up exhibition currently on show at V&A Dundee in the upper foyer until Jan 2021. <https://www.vam.ac.uk/dundee/exhibitions/futuresewingbox>.

Downloadable Resources: <https://www.vam.ac.uk/dundee/info/sewing-box-for-the-future-resources>.

Sewing Box for the Future podcast: <https://www.vam.ac.uk/dundee/articles/what-is-sewing-box-for-the-future>.

Jen Ballie, 'e-Co-Textile Design: How can textile design and making, combined with social media tools, achieve a more sustainable fast fashion future?' (PhD thesis, University of the Arts London, 2013). See <https://ualresearchonline.arts.ac.uk/id/eprint/7789/1/Ballie-PhD-thesis-2013.pdf>.

# Moving Mountains:

## World Circular Textiles Day 2050

A panel discussion convened by Becky Earley with Cyndi Rhoades (Worn Again Technologies), Jade Wilting (Circle Economy, Amsterdam) and Kate Goldsworthy (CCD)

Cyndi Rhoades founded Worn Again Technologies, originally called Worn Again, back in 2005 with a determination to make a difference and a business out of solving the challenge of textiles becoming 'waste' and ending up in landfill or incineration.

Jade Wilting is partnership and community manager at the Textiles Programme at Circle Economy. She currently leads and manages the development and facilitation of On Course - a suite of workshops aimed at educating apparel brands and fashion schools on the topic of circularity.



Photographer: Kate Wakeling.

It's all about resources



Global consumption, waste and textile to textile recycling statistics. Slide image by Cyndi Rhoades.

This is a transcription from a panel discussion, convened by Becky Earley for the Five Days, Ten Years, One Planet UAL Climate Network event (25 September 2020).

**BECKY:** Today, on the panel, we have Cyndi Rhodes from Worn Again Technologies, Jade Wilting from Circle Economy, Amsterdam, and Dr Kate Goldsworthy from Centre for Circular Design. We're all here as founding members of World Circular Textiles Day. This is a sneak peek; you are the first public audience to find out about this venture. It's about bringing together all the key players in circular textiles, in the textiles industry, to rally and achieve full circularity by 2050. This is a 30-year ambition. It's a plan we've been working on for some time.

This session is about how we're bringing people together to propose real change, a roadmap, scientifically-informed social, technological, and industry change. You might wonder why we've got a picture of a mountain in all of our social media and on this slide here; it's about moving mountains. Because to achieve full circularity by 2050, there's a lot of work to do; it really is quite phenomenal what needs to be achieved. Yet in a very short space of time we have brought together an extraordinary portfolio of founding signatories. It's been an incredible process to see all the different companies, R&D companies, NGOs, brands, and individuals who are dedicating their career to creating a circular, renewable industry. A total transformation of a polluting industry.

It gives me great pleasure to hand over now to each of the panellists who have prepared a really short presentation to introduce their angle, their perspective, and in a sense which 'mountain' it is that they're concerned with.

**CYNDI:** Thank you very much for that, Becky. Thanks for organizing this session. It really is a test run, so it will be great to hear what people's thoughts are, their feedback, questions, ideas, and hopefully, you'll all get involved on the actual day.

This is a bit of a doom-and-gloom slide. The good news about starting out with that is it means we can then go on to talk about solutions, which is exciting I think this slide for me really brings it home. It's all about resources, circularity is all about resources and managing them better.

Circularity is all about resources and how we manage them. At the moment, on the left here, we've got the pile of textiles made using polyester and cotton every year. It's an extraordinary amount of raw materials that go into making textiles. This is an old number in 2015, I'm sure there's more recent ones, but it's expansive.

The challenge in the next 10 years is the demand for polyester and cotton - the highest used fibres in the industry - is set to increase by 63%, which is huge. That means vast amounts of energy, land use, pesticides, all sorts of things to make cotton and polyester, which we're going to struggle with in the coming years.

Now at the same time that we're putting all of these resource constraints on the planet, we're throwing away almost as much as we're making every year, that third column there, with around 53 million tons of post-consumer and post-industrial textile waste going to landfill every year. It's absolutely ludicrous.

It's summed up by the tiny little 1% there, which shows that, out of all of this, less than 1% of end-of-use textiles are going back into making new textiles. We have this crazy system where we're making so much and we're not able to recycle any of it. That's really the reason for our existence, Worn Again Technologies. We realized that the challenges today with recycling textiles are mainly economic and technical. The solutions for being able to turn old textiles back into new textiles are limited.

Back in 2012, we started the development of a technology that could take in end-of-use textiles, which are not suitable for reuse, and they can go through our process, if their made from polyester and/or cotton. They're broken down, the raw materials are separated, decontaminated, and extracted to go back into fibre spinning for both polyester and cellulose. Ultimately, a circularity solution to turn old textiles back into new textiles.

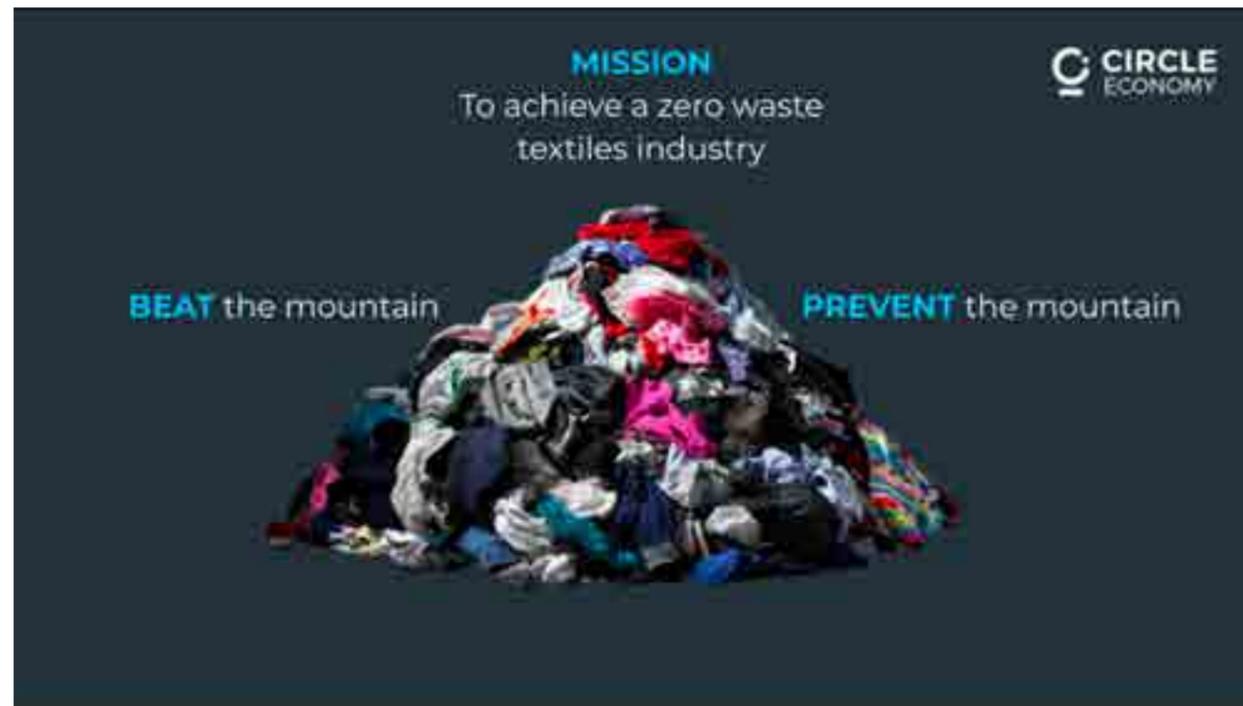
**BECKY:** Thank you, Cyndi. Great intro and great context because you are the real founding member here; it's been your idea to set up this World Circular Textiles Day. Of course, you are a long-term pioneer of processes and

technologies for circular textiles. We'll find out a bit more during the Q&A. If I can now hand over to Jade Wilting from Circle Economy to talk about her 'mountain'.

**JADE:** As Cyndi has already mentioned, it is all about resources, and at Circle Economy, we deal with a similar mountain. When you to talk about these resources and circularity, it's really important to start re-imagining who these resource providers are, and who the resource owners are.

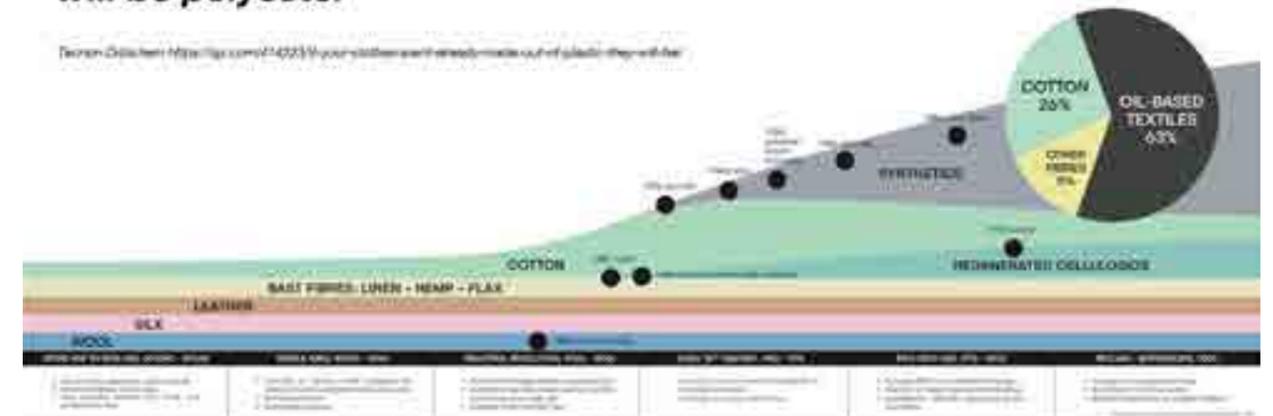
In a circular economy, you could imagine that the new resource providers are the previous linear consumers. So, if we're all wearing clothing for a certain amount of time, what happens after we've worn that clothing? And if we are returning it nto brands, then surely brands couldcan be the owners of these resources.

If you were to imagine all of the textile problems as a mountain, you can think that there's work to be done on two sides of the mountain. On the left side, beating the mountain. That's all about building the data, the infrastructure, and the technology that's needed to valorise textile waste. It's really important to scale technologies that are currently out there so we can process this massive growing mountain. On the right side, that's all about how we can prevent the mountain from getting any bigger than it is currently. That's all about building capacity in industry and education to assist and adopt circular strategies. It's



A strategy for textile waste. Slide image compiled by Circle Economy.

**By 2025 it is predicted that we will produce 90.5 million tonnes of polyester annually and that more than 93% of future fibre production will be polyester**



Historical picture for fibre volumes and types. Slide image compiled by Kate Goldsworthy.

really important that we're working on both sides of this mountain and understand how we can use these resources that we already have for as long as possible.

The reason why we've co-founded World Circular Textiles Day is because we've seen a range of different commitments coming in over recent years. I'm sure you're all familiar with the Global Fashion Agenda and some of the commitments that came out of that in 2017. That was really fantastic to see. Here, we saw a lot of brands commit to goals that were for 2020.

**What we're really interested in now is how we're all going to get to full circularity by 2050. What we're hoping to do with the World Circular Textiles Day is create a roadmap that makes all of this, from high level to the most detailed level, very visible and clear so that we can make sure that we achieve that.**

**KATE:** My 'mountain' looks more of a gentle slope, but it's every textile that's been produced since we first began making fibres. Where are we now in terms of innovation and fibre types? It's incredible when you think that until about halfway up this slope, just at the beginning of the steep part, in the 1900s, we had only five fibres in use. There were no man-made fibres. All of those happened just over the last 100 years.

It's really incredible to think of the positive impacts that they've had, as well as negative, on the world in terms of innovation, technology advancement, from medical improvements through to communications and transport, as well as clothes and all the stuff around us. I think it's really incredible when you zoom forward to today, at the end of this slide on the right, and see the complete dominance of man-made, in particular, oil-based textile fibres today. They are well over half of the fibre picture globally, and along with cotton, represent almost 90% of that picture. Those are the two fibre types that the regeneration technology being piloted by Worn Again can deal with.

Just think about the impact of being able to recollect and valorise 90% of everything we use in the future. That's not to say there's not still space for incredible innovation in the other 10% and environmental improvements across 100%, but we really do need to tackle this problem. Otherwise, there is no circularity and what we're doing is simply kicking the can down the road a little bit further. The call to action really, for me, is that polyester is so essential to our lives. We need to better value it and appreciate the millions of years it took to create.

I just want to zoom forward now to 2050 and give a vision of a world when polyester is no longer even referred to as a non-renewable.

If Worn Again's technology comes to fruition in the next few years, then all of a sudden that turns this massive non-renewable resource into a renewable one. I think that's the vision that I would really like to see happening long before 2050.

**BECKY:** I've got a few questions lined up, and then we're going to throw the floor open. I would like to start with Cyndi. I'd like you to tell us about World Circular Textiles Day and how people can join in.

**CYNDI:** Firstly, it's a day to celebrate, to celebrate the growing community of companies, organizations, and individuals who are all actively working towards a circular future and to really get these messages out there. Secondly, it's about imagining what full circularity could look like if we actually achieved it. We have a vision that circular 2050 will be a time when there's dignity, equity, and equality for those working in the industry and a time when all textile resources in the form of products and raw materials are kept in continual circulation.

The short version of that is no virgin resources are being used by 2050. As part of World Circular Textiles Day, we're launching a website which will provide a framework for a collaborative roadmap, to be developed by the industry and individuals, one which is continually revised over the next 30 years, until the vision is actually achieved. The aim of this website would be for it to become a living and breathing time capsule, that captures the progress; it charts the momentum of circularity and how we get there over the next 30 years.

**BECKY:** Thank you, Cyndi. I realise you've had to condense and boil down years and years of your thinking into that answer there! Why is it that you think creating a single day that happens every year for the next 30 years is a good way for us to be tackling the mountain? What's it going to do?

**CYNDI:** Well, I think that, hopefully, it's going to be more than just one day a year. It gives us a focal point which is really important. After COVID hit, a lot of us were concerned about what it would mean for circularity and for the challenges of textile waste. We were having a lot of discussions about what was happening, joining webinars, talking about how bad the problems were. We realized that there was a need for a more positive outlook and that was where the idea came from. Imagining what it could look like. Once we know what it looks like, we can start working backwards and focus on the stepping stones for getting there as an industry.

Once you know where you want to get to, it's much easier to plan the journey. We've come up with this concept of full circularity by 2050, telling the story retrospectively in three distinct phases.

First is the R&D and the innovation year. That's from 2010 to 2025 and we're right in the middle of that now. We have all the puzzle pieces for forming the system, but we're still figuring out how we put it all together.

Then next, comes the infrastructure in the rollout years which is 2025 to 2040. That's when we've got the model for the system with the collection systems feeding into re-use and regenerative cycling, designing for circularity, digital platforms with product platforms. All the components of circularity in the model, but we just need to then replicate that and roll that out.

Then the third phase is the expansion in the completion years, 2040 to 2050. This is when we have all the systems in place, have been rolled out, but we really need to just increase the capacity to eradicate the use of virgin resources all together.

In 2050 we're going to have a big party! This is a starting point. I think collectively, all the founders of WCTD, we had an idea about what the three phases might look like but we don't have the answers. This is about an invitation to say, "Get involved help shape roadmap deliver the vision," and that's what the website will be about.

**BECKY:** It's so powerful and important to put future visions in place. I know that a lot of people are trying to embrace circularity, trying to move linear systems into circular ones. They're beginning to realise just how difficult that is and how much time is going to take, and there is a lack of vision and clarity about what the end goal is. There's a power behind the idea to co-create the shared vision and to then retro-engineer the end goal. I'm going to come to Jade now because it's been quite astonishing to see how these founding signatories flood in; it's been extraordinary just how many people have come back to us and what they've been saying. Jade, could you tell us a bit more about some of the comments, ideas and general responses from industry?

**JADE:** It is exciting to see such a range of not only brands wanted to join, but innovators and circular soldiers and industry organisations joining. I think what is getting them excited from this is that it's a collaborative and joint effort towards circularity. I think anyone is able to contribute towards it and that's really the main message. I think the people joining all have that same ambition which is we want full circularity by 2050. Collective vision is what really catapulting this initiative in a way - it's just growing so quickly! That's also largely due to Cyndi and the work she's been doing over the past few years. It's been really great to see the really good feedback.

**BECKY:** I think people really felt that, yes, they needed a vision, but also, they needed a sense of collaboration too. To draw energy from each other to pursue something connected, because we have been seeing lots of different innovations coming through from technology, from strategy, from design, but not really joining up. This is something that Kate and I have been thinking about and working on quite a bit. Kate, could you talk more about our interconnected vision for circular textiles? How you see it working here for World Circular Textiles Day?

**KATE:** We have started to touch on the most important thing about this to me, which is this idea of shared vision. One of the real challenges of sustainability in general has been some of the tensions between different solutions, and how they might fit together. The thing that I remember being so excited about with circularity, when I first came across the concept, was this idea that it gave a vision that everyone could pull together in the same direction. Obviously, it's turned out to be certainly more complex than that, but I do think that potential is still there.

I think we have to understand with circularity that it's not purely about this virgin recovery of resources; but without that, it doesn't exist. Without that, it's purely an extension or pushing things into the future. Once we've got that, once it's possible, then all of the other things that we feel intuitively are the right thing to do - making things better quality, finding new ways to share resources, to reinvent, remanufacture, to retain value - all become equally important. But what we need to do is to not allow anything to be building that mountain. We need to start making the mountain regenerate itself on the future basis. One of the really interesting things we did right at start with Worn Again was to look at how much potential feedstock there was already in existence. We quickly realised that if we were never to create a new material from virgin materials again, there's enough if we can pull these things together.

The other exciting thing about all this is the living and breathing time capsule - it gives us a barometer or way to know where we are. That's exciting to me because in our world of academia, things get committed to paper and are 'fixed' quite often, and this is one of those areas that is just transforming so rapidly. I think this is a brilliant way to keep a handle on that process.

**BECKY:** I'm now going to throw over to the audience and a question that came in via Instagram. There's huge concern amongst this next generation about greenwashing and about whether circularity is a 'get out' card for companies; they make a recycled product, they give it a lot of marketing spin, but actually the fundamental linear volume model of the company doesn't change. How do we align incremental progress and development with this 30-year ambition? How are we going to avoid letting companies greenwash and actually make it a genuine movement?

**JADE:** Accountability. That's what springs to my mind. It's interesting that the question has come from Instagram because we've seen such a huge change in the role that social media can play in accountability. What will start happening in the next few years – and we really see it happening already – is that there is a much quicker contact line between consumers and brands. There are so many channels now.

**Greenwashing, it happens unfortunately, but I think the vigilance is increasing. Consumer vigilance and also consumer 'ballsiness' is increasing.**

Just to contact the brand and say, "I'm curious as to what your supply chain is, what are your renewable materials?" or, "Do you have any preferred fibres, where can I find that information?" It's great to see that there's an increase in how consumers are interacting with brands.

On the other side, I think also there was a huge party paid for policy on imposing incentives towards brands to really integrate the practices beyond marketing and communications so think about incorporating recycled textiles. You could look at policy that gift brands tax breaks, for instance so that they're incentivized to incorporate recycled textiles. France has got a fantastic policy that encourages this, for example, and so I think each kind of actor has got its role to play. I think policy is a really important role. Consumers have a very important role to play in preventing greenwashing and peers so other brands. That's a discussion that could possibly happen more often in a pre-competitive air of course. I believe that we're moving towards more transparency, and I hope that we can hold each other more accountable especially with an open document and open living roadmap.

**BECKY:** What happens when a company wants to transform to circular practices? How do they start? With one product and then it evolves? Kate, Cyndi, do you want to just complete the answers around that first question?

**CYNDI:** Jade summed up a lot of the dynamics which are really important and evolving and changing. That transparency issue; we're moving into a time now where it's hard to greenwash these days without getting busted. I think we've evolved from that. In our experience, so many of the brands and the retailers now are actively engaged in transformation and change but they have massive supply chains. They're global, there's a heck of a lot of work that needs to be done. In our experience, we've witnessed real commitment internally by many different companies wanting to actually lift the bar on these issues.

I'm less worried about greenwashing and more worried about how can we really accelerate this change, because I haven't met that many people that aren't interested in making it happen. (In fact, no one!) As you were saying, Becky, we're involved in linear supply chains. We're talking about creating a whole new system, it's a new way of doing things and there are a lot of tweaks that need to happen to make it work, and that's what everyone's focused on with circularity.

Even the very nature of circularity can get us away from all that hidden stuff. Everything's going to be transparent because brands need to know where their raw materials came from, where it was produced. Consumers are asking for it, the social media side of it. I think it's moving in the right direction. The question is, how do we make it happen quicker?

**KATE:** I couldn't agree with you more, Cyndi. I'm optimistic about, in a way, the role of industry in this as an equal partner. Becky and I are in so much positive energy from the people working in industry over the years.

**This idea of transparency and the technology in that area is such an interesting space because there's getting less and less places for people to hide in the supply chain. The problem of not being able to see far enough into your supply chain is starting to get better with a lot of the companies that we are meeting.**

Also, the social media side of things is a double-edged sword. In that, it provides on one hand this incredible platform for activism and marketing. Just look at the success of Fashion Revolution which is effectively a marketing campaign that has brought voices together from all over the world. Yet social media has also fed fast fashion; it's something used by the same generation to be more engaged in fast fashion. I think it's more about intent, than one type of technology or another being more green. How do we really harness that marketing brilliantly for circularity?

**BECKY:** Exactly what I was going to say. This is an effort in harnessing, isn't it? All the technology, all of the opportunities, all of the networks that are there and building towards a real vision that's been co-created and that has got people committed and signed up to it. Now I've got some specific questions I want you to think about. One person would really like to know about the future of leather. What's going to be happening with leather in the future?

**KATE:** It's a problem in so many ways but all I really wanted to say about leather is it's a bit like denim in that it has its own industry around it. Obviously, the environmental issues and societal issues around the production of leather and the finishing of it are huge. In terms of circularity, there are some really interesting companies regenerating leather in a mechanical way for the short term but there's also just starting to be some fascinating research around the regeneration of protein fibres. Cellulosics and synthetics have been developing these for decades now, but there's some fascinating work around regenerating protein fibres – so hair and skin products – that I think could provide some real innovation in the future.

**BECKY:** It's a really, really broad materials palette out there when you look through the lens of circularity and the challenges that lie ahead. How does the second-hand market fit into this vision of total circularity by 2050?

**CYNDI:** Our vision of circularity is about keeping products as products for as long as possible. Then when they can no longer be used as products, we break them down to recapture the raw materials. Circularity at 100% – well, that's partially about reuse. There are so many different facets of that, but it opens up a whole new world for all the reuse platforms, the rental, the leasing. That should be the number one goal; products as products for as long as possible.

That's top in the tier when it comes to circularity and then once those products can no longer be reused, we can recapture the raw materials. Polyester has always had such a negative connotation. But look at it as a regenerative, renewable resource. It's just brilliant because we put all of this energy into drilling for oil, mining for it, and pulling it out of the ground. The worst thing we could do is throw it away and not reuse it again. We do have the challenge of microfibres, so we need to overcome that and prevent those from ending up in rivers and oceans. I think there's a lot of technology and innovation happening around that, so if we can tackle that, that would be good too.

## Notes

Watch the 8 October 2020 launch seminar on YouTube <https://circulardesign.org.uk/events/world-circular-textiles-day-2020>.

To get involved, contact [mail@worldcirculartextilesday.com](mailto:mail@worldcirculartextilesday.com).

# Afterwords

## THANKS TO

CCD Team: We decided to undertake making this book, in part because it would give us a chance to share and support each other, as well as help get out ideas out there in a popular format. For early career researchers, learning to critique and edit texts for publication is an essential skill, and this book gave us the chance to practice on each other. The colour coding of contributions denote what kind of format the authors chose to work with: violet for 1,000-word essay; mustard for interview; and rose for 500-word picture essay.

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