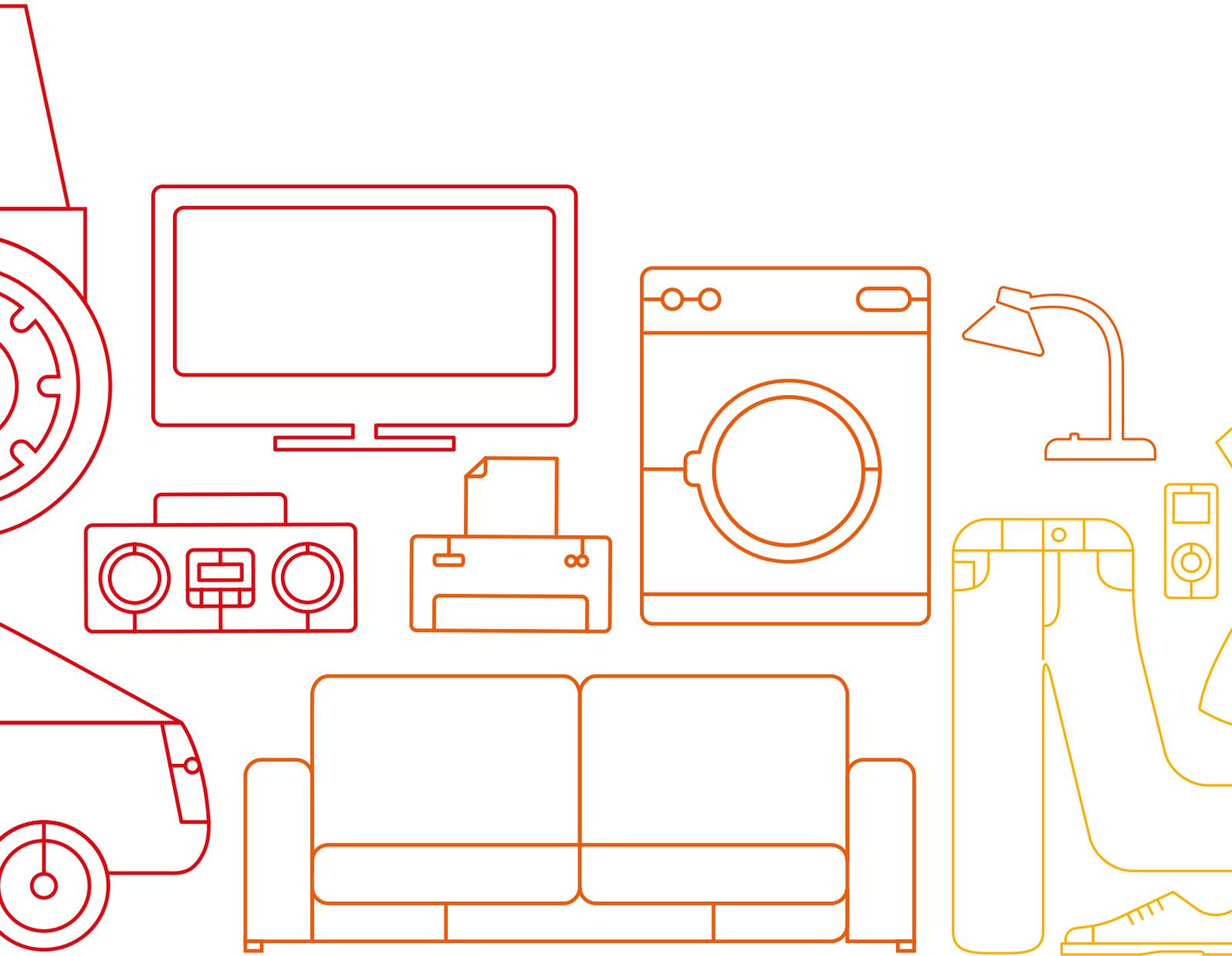


March 2016

# Designing for a circular economy: Lessons from The Great Recovery 2012 - 2016

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# How to read this report

The Great Recovery journey has been a four year investigation, pulling apart manufacturing systems and products to scrutinise the impact of design and new possible routes to a more circular economy. We set out to build and connect the new and growing circular design community, to support and encourage new business entries to Innovate UK's competitions, and to bring research rooted in insight and active investigation to the table of circular economy.

We started at the current end-of-life of things and worked backwards, asking questions along the way. We connected designers to those that might know answers and we quickly opened the discussion out to material experts, chemists, resource recoverers, policy makers, business developers, consultants, logistics managers and others who become part of the design teams.

Whether internally in a business, or across organisations, creating cultural and behavioural shifts is challenging. The Great Recovery's methodologies were developed whilst getting down and dirty in the supply chains of products and materials, and have highlighted key factors in enabling such shifts. These are namely; the transfer of insight and knowledge through cross-sector networking, multi-level communication and engagement including onsite and online platforms for debate, and empirical, action-based insight learning that leads to design iteration.

This report is both a record of the activities and impact of The Great Recovery project over the last four years, and a guide for those wishing to understand and advocate the need for systemic change. In keeping with the project's practical approach and emphasis on learned experience, rather than being an academic study it details the real-life findings and personal reflections of the value attained through direct quotations and examples from our network. These participants cross the divides of academia, design, industry, policy and entrepreneurship, and represent a 'snapshot' of our wider network.



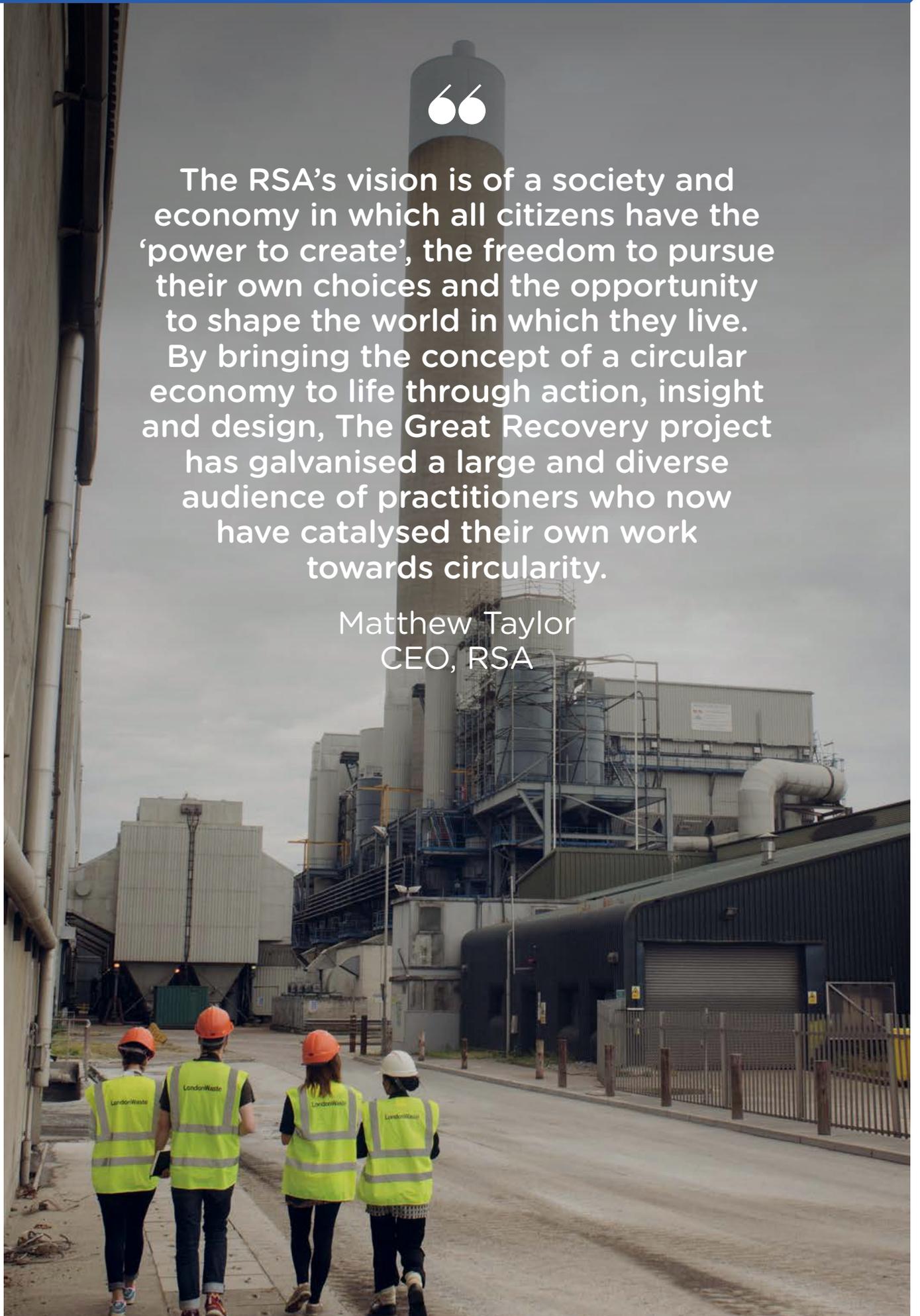
We urgently need all designers to visit end-of-life facilities so they can see for themselves how we are blindly designing waste into the system by creating products that are complex and increasingly harder to deconstruct and recycle.

Sophie Thomas  
Director of Circular Economy and Project  
Director for The Great Recovery.



The RSA's vision is of a society and economy in which all citizens have the 'power to create', the freedom to pursue their own choices and the opportunity to shape the world in which they live. By bringing the concept of a circular economy to life through action, insight and design, The Great Recovery project has galvanised a large and diverse audience of practitioners who now have catalysed their own work towards circularity.

Matthew Taylor  
CEO, RSA





# Steps & lessons learned

**This report brings together the experiences of people and organisations in our network and extrapolates a series of steps made, and lessons learned in our investigation into the role of design in the circular economy:**

## 1. Articulate the challenge

The shift towards a circular economy is not purely a design issue but design is a critical player. From setting out our position that waste was a design flaw we learned that the potential for design to influence and impact the way that we make, consume and dispose of our stuff was huge.

## 2. Be open & supportive

Through taking on the role of the convener we helped set out the macro view and enable fruitful networking from an open and supportive position. Building an authoritative, collaborative platform for investigation, ideas and events pushes the agenda and galvanises action.

## 3. Embrace the complexity & map the systems

We found that our visual design focus was key in conveying the challenges and possibilities without detracting from the complexity. The Four Design Models and Circular Network diagrams were the ideal tools for this and have been referenced all over the world.

## 4. Amplify the conversations

Building a project around an open platform for conversations and debate allowed us to be agile and reactive when challenges were raised. The network was our expert panel and sounding board, and their collective views and findings were amplified at policy roundtables and industry events.

## 5. Make the connections

We learned to be generous. The Great Recovery would be nothing without its network, and one of our most important roles was in supporting the work of those who were already embarked on a circular economy journey.

## 6. Learn through (un)doing

Our teaching methodology was deeply embedded in kinaesthetic learning. Visiting a waste site or taking apart a discarded object is a highly effective way to demonstrate the visceral and challenging nature of a circular economy.

## 7. Show, don't preach

All our communication became design focused in its application which lent the project a more human aspect and invited new participants to join the movement in a more active, creative and challenging way.

## 8. Make space for testing, failing & prototyping

We learned early on that businesses wanted practical, neutral space in which they could test ideas and new relationships, especially if these ideas could fail. Our partnership with Fab Lab offered such a 'safe fail' space which brought with it a new network of disrupters, entrepreneurs and makers.

## 9. Experiment and re-design

Through our workshops, events and design residencies we have learned to take an experimental approach, without taking an authoritative position by offering up our own solutions. We have allowed for the emergence of new and unexpected outcomes from our action based learning, because you never know what a teardown will uncover.

## 10. Push for policy & reform

Our starting point has been to understand how the advocacy work done by those working at the theoretical scale of the circular economy could be adopted and implemented by the design community. Approaching this through our learning methodology meant we moved quickly into the details, often focusing on how materials were being specified or what design element could change. We learned that this perspective helped explain what was in the way and stopping bigger shifts which could be articulated to the influencers in the circular network.

# Recommendations

UK and EU Government must commit to supporting the move towards a circular economy by building a palette of policies, investments and design support systems that enable positive behaviour change from all actors in the circular network.

Research bodies, trade and government organisations should partner to replicate and scale the convening role played by The Great Recovery in order broker network relationships, catalyse diverse partnerships and creatively engage network sectors through a range of experiential and design focused events and media.

Universities, maker spaces and interested commercial partners should collaborate to develop and invest resources in a physical 'hub', based on the make-space concept and dedicated to the circular economy research, design and development.

Closer links with the design and material development sectors and resource management should be fostered through a programme of design residencies funded through business partnerships, waste trade organisations and government programmes.

Through Innovate UK and other EU funding models, the UK government should continue to support and promote a programme of innovation-focused competitions and loan schemes in each sector and in cross level challenges to fuel new business ideas and enable cross to enable 'leap frogging' in the R&D stage through knowledge sharing and collaboration.

*We look to the future of the circular economy and call for this learning and expertise to be scaled up and taken into businesses and communities to be tested and refined through practice and iteration.*

Through the role of convenor, government and trade organisations should invest in UK cross-sector evidence gathering exercise that analyses raw material demands and waste created (mass balance) to understand future resource need versus waste created.

Working with organisations like UKELA UK government should run a comprehensive analysis and collation of the legal and legislative barriers and opportunities within different sectors as seen through the lens of the Circular Economy starting with those that have greater opportunities (e.g. construction sector).

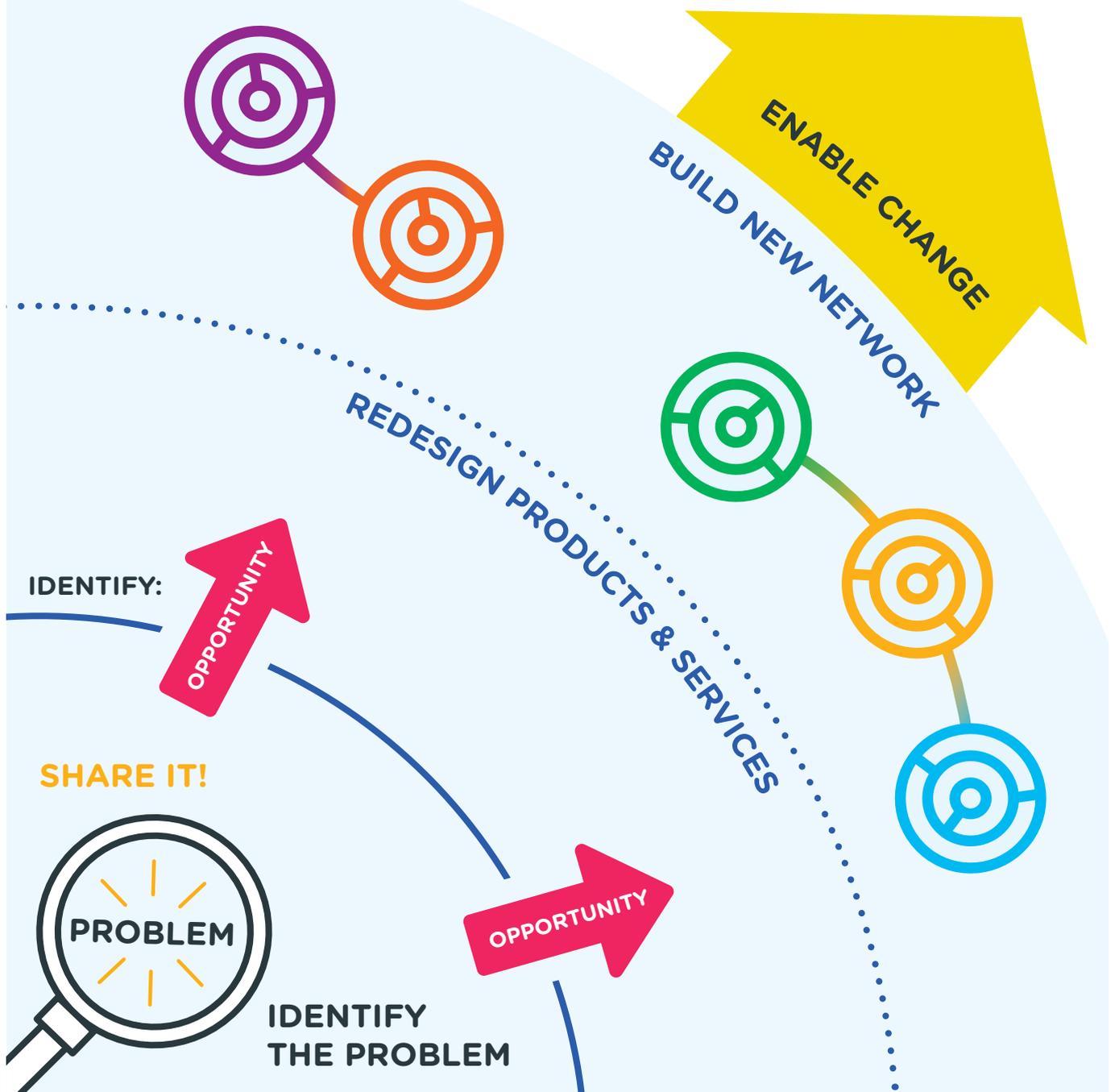
Government and trade organisations need to build on the design work of The Great Recovery to enable networks to move quickly towards prototyping and market testing. Investment at the network level must be allocated to support these investigation.

Universities and education organisations need to develop circular economy education programmes and curricula, incorporating action-based learning, that can be tailored for schools, universities, colleges and make-spaces.

National campaigns, supported by government, trade organisations, the third sector and businesses, should engage the circular network through creative public programmes that tell the stories of our products, and show the massive benefits that a shift to a circular economy could bring. These should explain, without dumbing down, what role each part of the network must play in order that the system maximises the value of the material flow.

# 1

## Articulate the challenge



**Sophie Thomas**  
 Director of Circular Economy, RSA

Many know the story of how The Great Recovery project came about. In 2011 I joined a UK government mission to Holland to study the Dutch strategies to 'design out landfill'. The Dutch introduced a ban on landfill in 1995 when space became an issue. This brave move shifted the way they were thinking about throwing things away, as away became unviable for them. Through this move they began to pioneer new strategies in resource efficiency and since then have been striving ahead into what is now known as a circular economy model for their cities and manufacturing. In fact it is safe to say that their work trailblazed the way for the rest to follow.

The Dutch visit took us to facilities that sorted, recovered, and managed resource flows (or waste flows as we were defining it in the UK at that point). One of these facilities recycled fridges and freezers from all over Europe. As I observed the process I was struck by two things: the immense variety of models being processed coming in from all corners of Europe, and the dramatic split in the plant itself; with high-tech machines crushing and mechanically separating materials in one half, and the intense manual line with many workers trying to pull out any component that held value or hazard. Opening up the large containers that arrived daily full to the brim with fridges was the start of a long process full of complexity. Every single appliance was different. This meant that every time a disassembler tried manually to get the valuable compressor out from the back before crushing they were faced with a set of challenges; from different sizes and types of screws and materials, to fittings and frames blocking their way. It made me want to gather all the fridge designers and stand them behind these guys who, just by their actions, would demonstrate the problems inherent in the way we currently design these appliances. Throw in some hands-on teardown action, initiate discussions with those that write the design brief, involve those that develop the marketing and technology, and we could have better fridges and better fridge designers.

When I started to think about it I saw it wasn't just fridges that could benefit from this thinking. It is safe to say that waste affects every part of our society. Businesses, government, local authorities, and members of the public all play a part in the creation, management and disposal of waste.

For a long while I have heard the term 'design' used at government and business level, where solutions are being sought around resource scarcity and innovation. I have witnessed ministers and CEOs announcing that solutions lie in 'designing products for easy recycling, or for disassembly'. However, experience shows that designing a product like this will not be so simple. Even before the designer has had the first spark of an idea, the brief has been written and requirements laid out. The design chain, with its multitude of decisions and influences shaping the way is a hard and confusing path to navigate.

For us to understand how to change the way we teach, practice and use design in a more circular economy we need to re-set the thinking away from the current product-centric focus towards a more system based design approach. Through testing this principle, The Great Recovery project has demonstrated that by considering 'value' in a broader view - not as a price tag on a shop shelf, but around second or third life use, recoverable material streams and information and reverse logistics flows - can completely change the way we design. And fundamentally too we must expand the discussion around the process of 'design' into considering all participants in the 'design chain' to uncover insight as to why things fail and become waste too early.

*We learned that good design plays a critical role in the shift towards a circular economy. It significantly influences the way we make, consume and dispose of all products. We are convinced that waste is a design flaw.*

## Sharing best practice in the manufacturing space

*The Great Recovery works in the manufacturing space, at the cutting edge with design at its core. The community built up by The Great Recovery is a fantastic example of how RSA projects should work - bringing together communities of interest and sharing best practice. There's the legacy right there and this is what excites young designers. It's a perfect example of a 'power to create' RSA project for the 21st century.*

Clive Grinyer, Design Director & RSA Trustee



# 2

## Be open & supportive

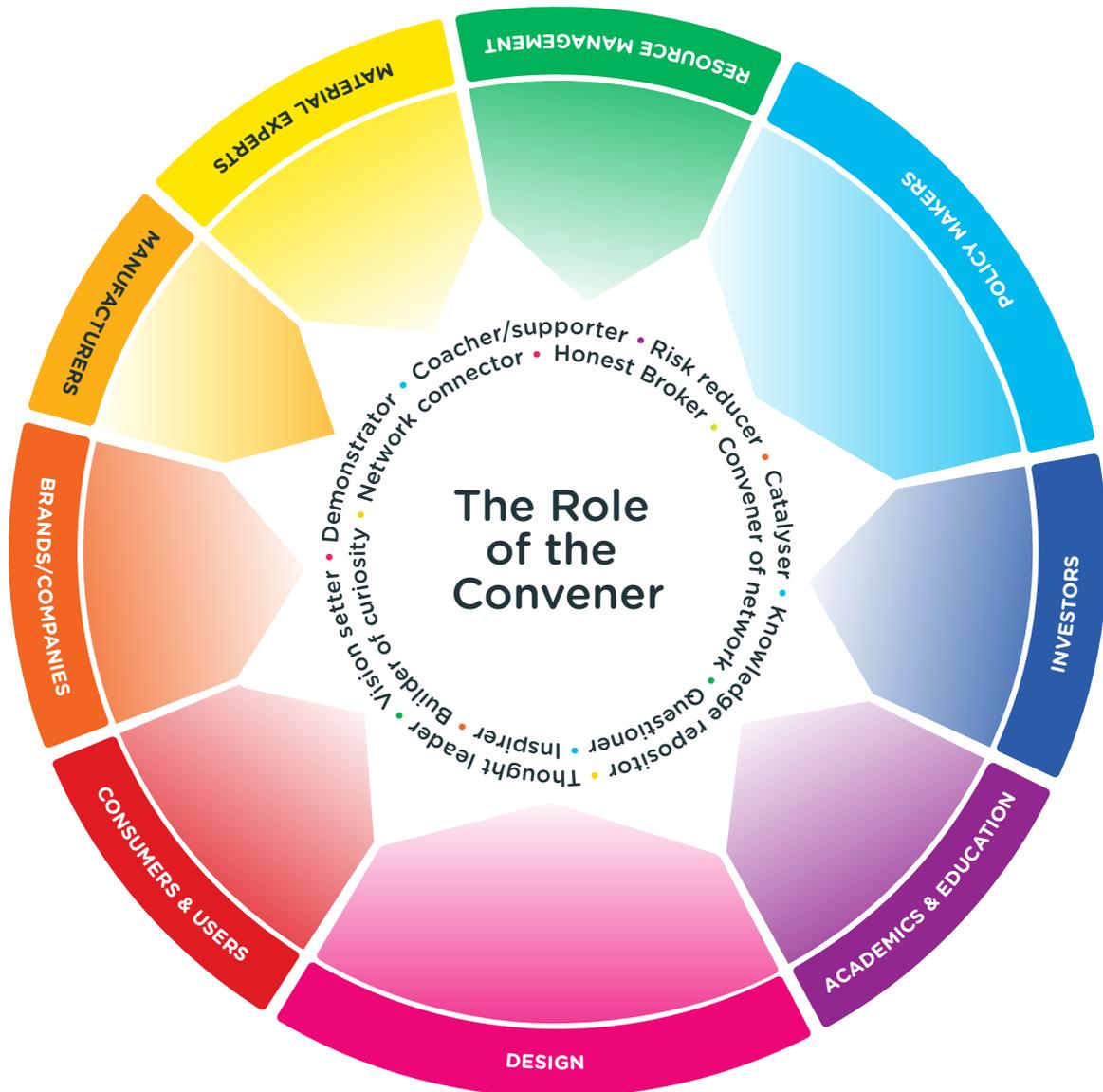


**At Innovate UK we have a focus on sustainable wealth creation. We see that the circular economy can deliver strong economic growth, create high value jobs, improve materials security and reduce environmental impact. Design sits right at the heart of creating a circular economy, and we wanted to start our programme with the designers.**

**In my first meetings with Sophie we set out a vision for The Great Recovery as a design focused movement that would explore what design can contribute to a circular economy, and would open the eyes of designers to the potential of circular economy thinking. It has enabled us to bring together actors from very different sectors and kinds of expertise to work together on new product, service and process ideas we can fund through our Innovate UK competitions.**

**Richard Miller**

**Deputy Director, Innovation in Industry, Innovate UK**



Since its launch, The Great Recovery project has been hosted at the Royal Society for the Encouragement of Arts, Manufactures and Commerce (RSA) and co-funded by Innovate UK, the government's technology innovation agency.

The RSA has been a cradle for social innovation and design since it was founded in the coffee houses of Covent Garden during the 18th Century Enlightenment. It hosts the Student Design Awards and the Royal Designers for Industry, both longstanding schemes which nurture the country's most exceptional design talents. It has a fellowship on 27,000 people across the globe, representing a powerful network of individuals who share the RSA's values.

Innovate UK is part of the government department for Business, Innovation and Skills. It supports and connects innovative businesses in order to accelerate growth in the UK economy, and provides grant funding

for R&D through its competitions, which cover such vital areas as cities, digital infrastructure, healthcare, agriculture and materials. Over the past three years, Innovate UK has supported the development of a circular economy through investing in new designs and business models that facilitate more circular approaches.

This partnership pulled together the RSA's unique history of innovation for the public good with opportunities for funding through Innovate UK's business focused competitions and networks.

*Through taking on a role of convener the project helped present the macro view and enable fruitful networking from an open and supportive position. Building an authoritative, convening platform for investigation, ideas and events pushes the agenda and galvanises action.*

# 3

## Embrace the complexity and map the systems



**The Great Recovery takes a practical, concept-specific approach to the abstract, influencing everyone from students to high-level policymakers with its great communication tools and an approach that is both structured and open ended.**

Liz Corbin  
Institute of Making, UCL

From the outset, The Great Recovery has aimed to engage people's imaginations through its tools of visual communication. The Four Design Models and Circular Network diagrams set out our philosophy of design and circularity early on in a simple, accessible way, and the use of colour and imagery lent a lively, human aspect to otherwise theoretical concepts.

For designers in particular, aesthetics do matter. In order to grab the attention of our diverse circular network, we had to make the circular economy personal and relevant without dumbing down or detracting from its meaning. This thinking even went into the project name. The words *Great Recovery*, whilst implying a challenge of scale, also represented hope and opportunity: the power of design and creativity to bring people together and repair our relationship with our stuff.

The circular economy has been defined in many different ways, incorporating approaches or principles

from industrial symbiosis, biomimicry, closed or open loop design, the sharing economy and other methodologies. Its brilliance lies in its expansiveness. But in order for its message to be direct and clear to as wide an audience as possible, and particularly those from the world of design, we needed to find a striking way of communicating its message – at a glance.

These graphic devices and have now become foundations for others when teaching first principles of circular design. They are used by designers to understand what model of circular design is the right fit for their concept and help map out who should be on the wider design team.

*We found that our visual design focus was key in conveying the challenges and possibilities without detracting from the complexity. The Four Design Models and Circular Network diagrams were the ideal tools for this and have been referenced all over the world.*



## Intuitive and disruptive

*The Great Recovery is disruptive and it's really making a difference. I train children, students and teachers on circular economy and deliver CPD in the classroom. For the last couple of years we've used The Great Recovery diagrams because they make so much sense - you don't need lots of experience to use them as they are so intuitive.*

Steven Parkinson,  
Design & Technology consultant, lecturer  
and Co-Founder of Teach Design

## Offering tangible examples

*It was difficult to convey the concept of a circular economy before The Great Recovery came along. The project has served to provide a tangible example of what it means to tackle this huge, global phenomenon.*

Liz Corbin, Doctoral Researcher,  
Institute of Making, UCL

## Incorporated into teaching models

*The Great Recovery's work has had a big impact on our own fixing and re-use projects, and has been incorporated into the teaching model that we share with our network of maker libraries around the world.*

*The stories narrated on the website, particularly around the bulky waste design residency, are extremely valuable resources that raise the profile of circularity and create content that support the arguments around shifting towards more circular systems.*

*Our new Central Research Laboratory in Hayes nurtures design start-ups, and when they talk about prototyping we use The Great Recovery diagrams to challenge their decisions in terms of planning, material choice and partners.*

Daniel Charny, Professor and Curator of  
Contemporary Design, Founder of Fixperts

### Tool 1: The Four Design Models

Much of our thinking has evolved around our diagrammatic approach in understanding the different paths a product can take in order to be designed for circularity. This thinking is expressed through the four models, or principles. Ideally we look to design as close to the user as possible on the inner loop - for longevity, but if that is not realistic or relevant to the product we move on to designing for a different business model: leasing or service. The next loop of remanufacturing

sees broken components replaced and the product restored to its original state, whilst the outer loop of material recovery (or recycling) involves the complete breakdown of materials before some are restored to the manufacturing process. The model allows the designer to understand who are key knowledge holders for the extended design team.



### Tool 2: The Circular Network

From a very early point we sought to identify who could be influencers when designing for circularity. This list further developed into the Circular Network diagram, making it easy to see all of those industries and practitioners who need to be involved in the creation of a more circular economic system. From local governments to waste managers to designers, it tells us what we already know, that all of these actors need to be engaged in creating change and have the potential to be part of a bigger design chain.

This tool connects the traditional supply chain stakeholder map to materials and resource experts for primary and secondary material streams and the influencers in both policy and investment and education. Many times people told us that they didn't consider some of the linkages until they saw this diagram. By including all of these players in the one circle it highlights the fact that we are all part of the system, we all have a part to play in shifting it and there is no hierarchy. We need to locate and 'own' our own segment of the circle, but we also need to recognise the importance of working with others.



# 4

## Amplify the conversations



**The Great Recovery is the water cooler that everyone congregates around.**

Charles Ross  
Lecturer, Falmouth University

Communicating with a broad network of other organisations and individuals through a variety of media has enabled us to continue a conversation about circularity at a bigger scale.

The Great Recovery was present at industry conferences, policy roundtables and other public events, promoting and connecting with new network members. All these have given us the opportunity to share our thinking and activities with a raft of practitioners, innovators and public figures.

There are many examples of the network in action: The M&S Plan A team played the Game of Circularity on our Resource stand at the 2015 Resource show, leading to The Great Recovery methodology being an integral part of the briefing for their in-store designers. An informal conversation about legal barriers to a circular economy led to two successful roundtables linking the UK Environmental Law Association (UKELA) and the Chartered Institute of Waste Management (CIWM), a survey of waste companies, media coverage, and the inclusion of findings in a submission to the

EU. Conversations and connections create more conversations and connections, and this is how a network or community of practice is built.

As well as the physical conversations, a presence on the RSA website and our own site and Twitter feed have seen us share news, events, blog posts, videos and case studies by and with our growing network. By tapping into this digital world we have been able to amplify our impact, to create buzz and excitement around our work, and to provide a platform and voice for those others who are daring to innovate in their own areas of circular economy expertise.

*Building a project around an open platform for conversations and debate allowed us to be agile and reactive when challenges were raised. Network members became our expert panel and sounding board, and their collective views and findings were amplified at policy roundtables and industry events and online.*

## Better applications to Innovate UK competitions

*The Great Recovery has done an enormous amount to engage the design community. The strength of the collateral and online presence is impressive. The events have helped deliver some of our core objectives, making the audience aware of the competitions and setting up some really interesting partnerships. Lots of dialogue and energy has been created, which has resulted in better applications – and some of those initial applicants have become key collaborators for us too.*

Ben Peace, Sustainability Lead,  
Knowledge Transfer Network



## A circular foundation built in the UK design community

*I first had the remarkable and rewarding experience of hosting The Great Recovery whilst working as a plastic bottle recycler... Later I found myself working at Innovate UK, responsible for supporting the project and able to see at first hand the benefits and insights it has produced as well as the foundation it's built in the UK design community for future work in this area. Design will play a vital role in the transition to a circular economy and thanks to The Great Recovery we're heading the in the right direction.*

Nick Cliffe, Lead Technologist  
Resource Efficiency, Innovate UK



## More open and unintimidated conversations

*Through their collaborative sharing and learning-focused approach, inviting others on their journey, The Great Recovery team have built a more open conversation around the circular economy. They provide encouraging, practical insight through unintimidating, accessible reports and workshops that invite new sectors to think about circular approaches in design and the role they can play.*

Erica Purvis and Sharon Prendeville,  
Open Source Circular Economy Days



# 5 Make the connections

As has been touched upon, one of the roles of The Great Recovery has been to support and disseminate the ground-breaking work being done by many other people and organisations in pursuit of a circular economy. Entrepreneurs, designers and others are already getting on and 'doing stuff', and we have been able to amplify their work. The Great Recovery has become the repository of information for 're-designers', 're-makers' and entrepreneurial thinkers who want to find anything from a new business partner to an article on behaviour change.

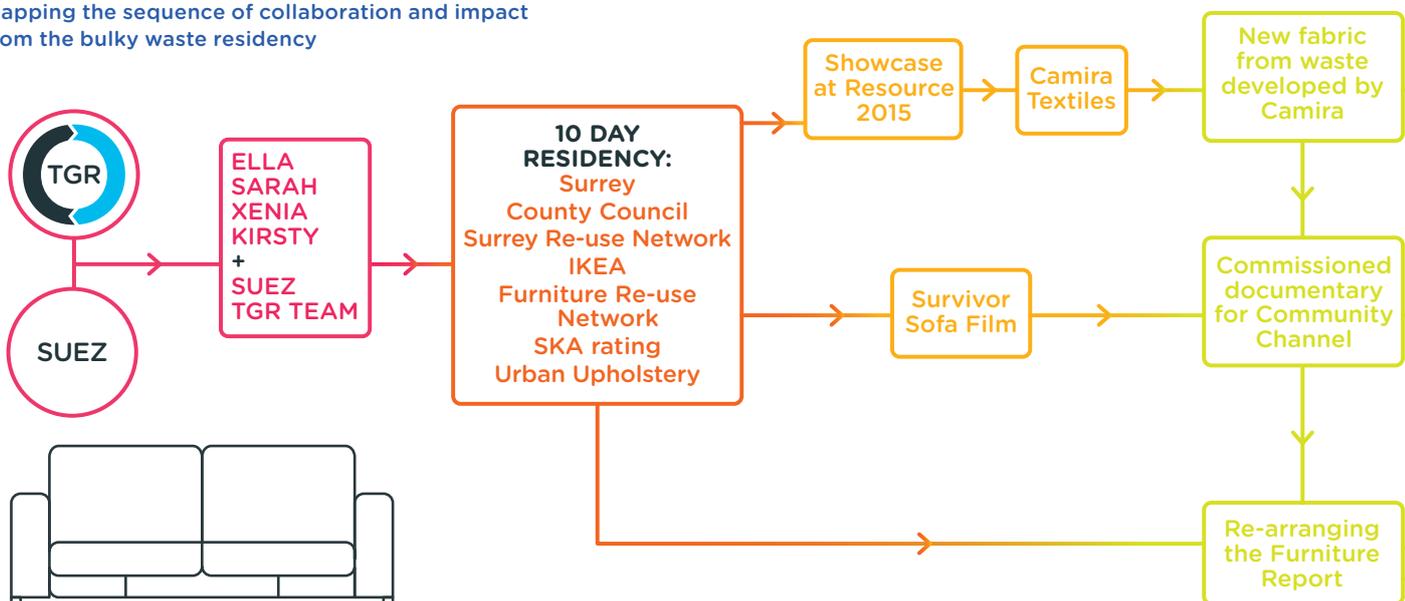
We have also been able to bring diverse groups together to better understand each other's situations, brokering new relationships between professions such as design and waste that would never otherwise meet and acting as a catalyst for those working towards collaborative impact. Our second phase of work focused on the relationship between the design, resource management and materials sectors, to build

further insight knowledge that could feed into the design process. Between 2013 and 2015 Innovate UK ran competition briefs that focused these sectors on circular economy. The Great Recovery supported these through creative workshops and supportive network events at which potential applicants could meet and form collaborative partnerships.

At the Resource show in 2014, we asked visitors to link themselves to those they would need to meet in order to pursue their own circular journey that we could help set up these connections. In 2015 we provided free space on our stand for small, innovative and design-based outfits. The platform provided to these 'disrupters' in turn enabled many more connections.

*We learned to be generous. The Great Recovery would be nothing without its network, and one of our most important roles was in supporting the work of those who were already embarked on a circular economy journey.*

Mapping the sequence of collaboration and impact from the bulky waste residency





## A mix of demographics questioning preconceptions

*It was at a Great Recovery event that we met Kingfisher and BioRegional, and together we worked on designing Project Box. We went on to win Innovate UK funding, and then put together the application for another pilot project. The project's innovative product and service design combination is key to circular design. The Great Recovery has done a good job of getting different demographics together to challenge and question preconceptions. I've had some great conversations with people at different events; debating longevity versus user focus.*

Rich Gilbert, The Agency of Design

## Kickstarting new businesses in service design

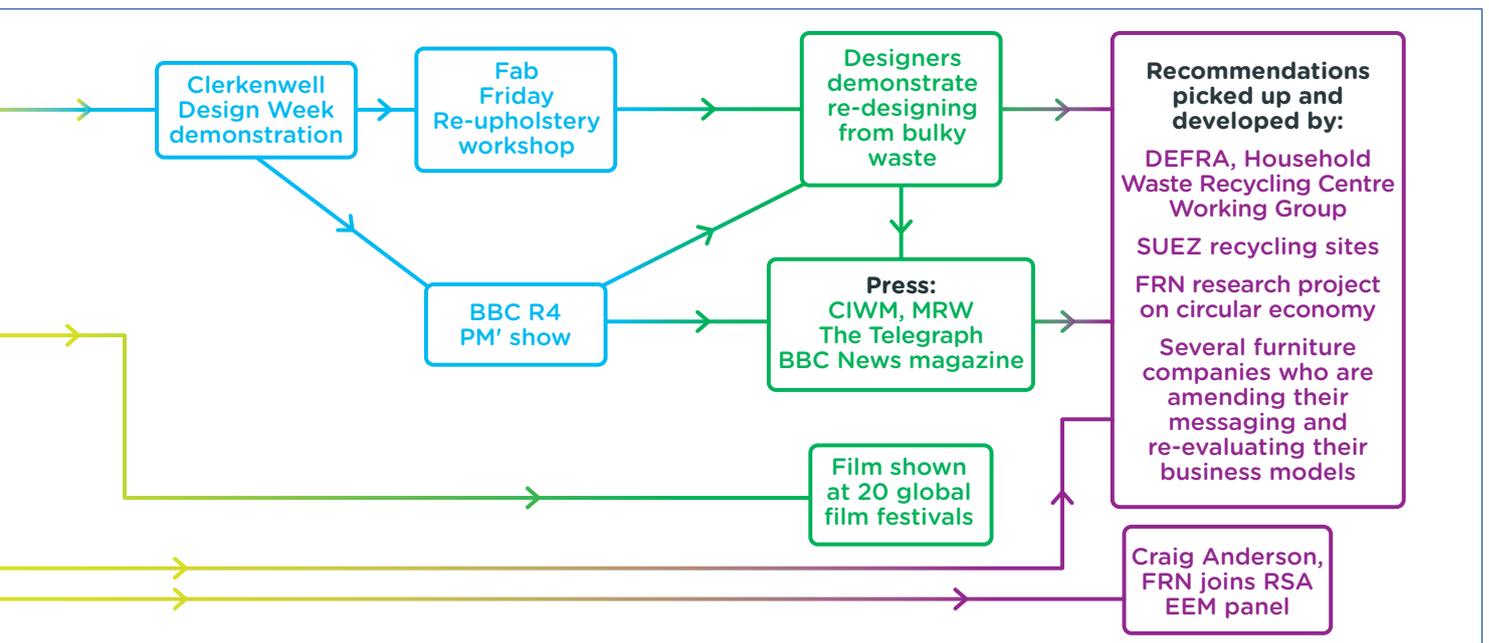
*I wanted a cross-cutting way of working that would find solutions to problems, rather than just designing products which I'd done before. I won my first circular economy project through the Innovate UK competition. There was a certain serendipity as I realised I was part of the circular network. I gained the confidence to set up my own business, and I met some of my first clients at The Great Recovery events. Since then things have really taken off: I've even run some Great Recovery workshops myself on service design.*

Rob Maslin, Founder of We Design

## Mixing it up to inspire new collaboration

*In the design industry there's lots of quality thinking out there, but you still need to be inspired. So the idea of mixing it up, by getting plastic recyclers talking to furniture manufacturers for example, catalyses new ideas and new processes. The Great Recovery's round table on textiles made everyone aware of the new Sew2Sew project and now lots of big players are looking to adopt it. I'm continuously in touch with lots of people I've met through The Great Recovery events and the project is responsible for bringing together a lot of eclectic groups of people who would never normally meet.*

Charles Ross, Lecturer, Falmouth University



# 6 Learn through (un)doing



**Blog posts and pictures you may forget, but you never forget the smell of a landfill site.**

Rich Gilbert  
The Agency of Design

Right from the start, The Great Recovery has explored the challenges of a circular economy in a hands-on and creative way, and has shared this action-based approach with thousands of people from our network. Where some may talk about the problems of waste and material recovery, we take designers to see those impacts for themselves. Where others discuss supply chains and materials streams, we get our workshop participants to take apart familiar everyday products, to identify the materials used (if they can) and consider the many processes that led them to be incorporated in that item – as well as the difficulties of recovery and re-use. We then challenge them to design differently and, using the four design models, to create products and business models that take account of the real value of materials, and the real costs of production.

The adage goes that hearing is forgetting, seeing is remembering, but only doing is understanding – and designers in particular are often visual and haptic learners. Seeing our consumer detritus at first hand in a huge pile on a windswept waste site hidden far

away from the town centre is often when the enormity of the problem hits home, and can be the first step in a journey towards reorientation of both practice and values. Being asked to take apart a product that was only ever designed for ease of assembly and manufacturing creates a kind of dissonance: on the one hand we may appreciate the design for its beauty, brilliance or perfect adaptation for (first) use, but on the other hand it may be impossible to separate the materials for re-use, and therefore the design has precipitated its demise.

Changing our systems, design practices and physical artefacts has to start with changing people's ways of viewing the world, their ideas, expectations and mental models. And often this begins with interrupting their assumptions by getting them to do something they have never done before.

*Our teaching methodology was deeply embedded in kinaesthetic learning to demonstrate the visceral and challenging nature of a circular economy.*



## A unique and powerful experience

*The Great Recovery's focus on design, and the power of designers to influence outcomes, is unique. The tactic of taking designers to confront products at the end of their lives, by experiencing landfills and recycling facilities, really stands out – as does Sophie's articulation of how that affected their attitudes.*

*The teardown sessions have also been very powerful, including one done specially for a Green Alliance conference which I know made a lasting impression on many of the participants.*

Julie Hill, Chair of WRAP, Associate of Green Alliance and author of *The Secret Life of Stuff*

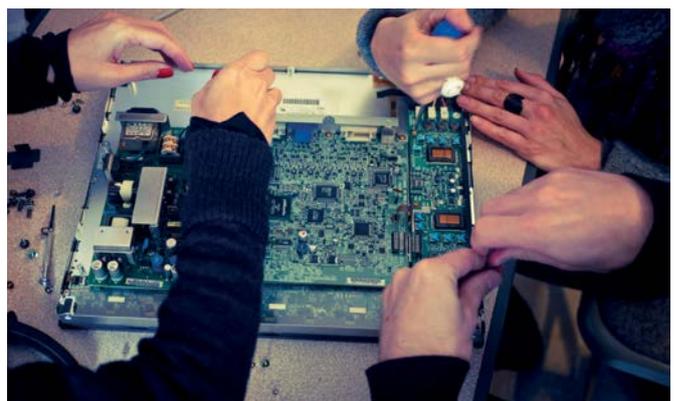
## Reading reports is not enough

*When you talk about the Circular Economy in theory it all sounds inspiring and makes sense. But it's a complex issue, and talking about it or reading reports is not enough to enable you to actually change your practice. When we started The Great Recovery, we began to take people to the various places where our possessions end up when they are no longer wanted. When we put on safety glasses and gloves, selected the right security screwdrivers, then prised apart TVs, washing machines, drills and speakers, we found that our mental models of the way products and businesses work were starting to break apart. The physical act of the 'teardown' was enough to begin a change in our way of thinking.*

*When, together as a group, we discussed how hard the objects were to take apart, and what the value was of the gold, copper and other components, we started to think about supply chains, the distance each object had travelled, and what it was worth now that it was discarded. That was just the beginning. The real magic began when we started redesigning for one of the 'circular models' that we had created. When we imagined each object being redesigned for fix and repair, for service design, or for parts to be re-used or recovered, we experienced the complexity of redesigning business models and our entire way of thinking about products and ownership.*

*At the time we felt that the workshops had been successful, as we saw the change in people and the intent to go back to their lives and change things. But the proof of the pudding is in the eating and the real triumph for me is that we regularly encounter people who have totally changed their design practice, their manufacturing strategy or their business model due to The Great Recovery. It continues to have a knock-on effect.*

Nat Hunter, Director, Machines Room and previously Co-director of Design, RSA



The ambition of the The Great Recovery project was to take apart and investigate the whole life (from manufacture to current disposal) of a multitude of objects that were varied in scale and material. We were often seen with our arms stretched out saying 'from disposable coffee cups to buildings and everything in-between'.

True to our word, many, things were scrutinised, taken apart and re-designed over the four year programme, the smallest being lipsticks, pens and toothbrushes and the largest an oil rig.



## A visceral response that sticks

*It's not every day you get the chance to visit a waste site or tear something apart - a simple exercise but really powerful. Rather than a slide presentation we went and saw where London's waste goes.*

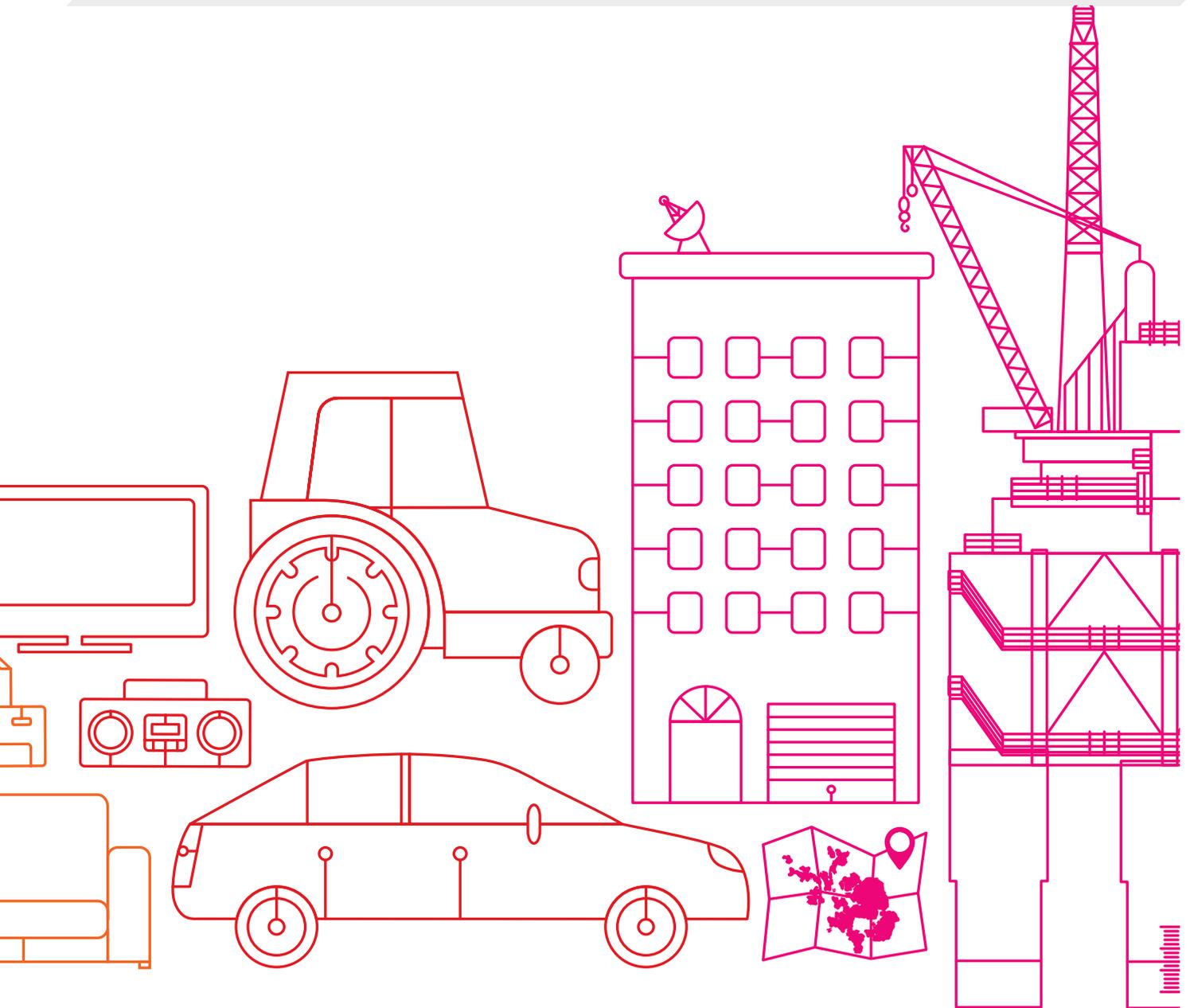
*Visits like these can provide enormous inspiration: seeing the infrastructure in front of you and getting that visceral response - those things really stick. You can know about things in theory, but going there you can translate some of those ideas into practice. It made me realise how, in the waste management business, the way things are collected or not, comes down to the economic-driven system. This, in turn, showed me where design could have impact.*

Rich Gilbert, The Agency of Design

## Awareness and learning is paramount for designers

*For me it was the visit to the electronics recycling plant in Kent that really stood out. We took things apart, tried to get those rare earth metals out - and that whole process was astounding. When you see the problem in front of you - tons and tons of printed circuit boards all piled up - it forces you to think long and hard about the terrible waste we are creating. I thought I had a reasonable knowledge of sustainable design, but learning about the different processes of recycling was eye-opening. The education and awareness that The Great Recovery is bringing to the design industry is paramount. Since the visit I've been working on light fittings and have managed to redesign four component parts into one.*

Terence Woodgate, RDI Designer



## Inspired to build circularity into other projects

*Design is such an influential part of the economy, and the circular network being built by The Great Recovery is amazing.*

*At the recent Fab Lab upholstery event we were rebuilding furniture. There were so many people from different backgrounds to share passions and ideas – the discussion was wide and varied. We are so inspired by The Great Recovery. The ‘Survivor sofa’ has inspired us to do our own furniture project and we are going to dedicate the final year of our MA to the circular economy.*

Mariana Pedrosa and Andrea Fischer, MA Service Design students, Royal College of Art

## Kinaesthetic learning is so important

*Going to the tin mine in Cornwall was fantastic. It was the launch workshop for the project and suddenly we were dressed in overalls and had this bag of unloved items to tear down including a washing machine. Most of us hadn't the foggiest idea which elements were in which stuff, and that was pretty shocking for us designers. Because we were all working round the table with our hands, the conversation really got started and grew, and we realised that we were all in this together. It was a great leveller.*

*We not only grasped the theory, we also rolled up our sleeves and got our hands dirty– and for designers, who are often kinaesthetic learners, that's so important.*

Charles Ross, Lecturer, Falmouth University

# 7

## Show, don't preach



**The Great Recovery project has taken the circular economy out of the realm of the ‘expert’ and into everyday experience. It has taught us to recalibrate our relationships with our stuff and dared to question our current economic models.**

**Lucy Chamberlin,**  
Head of Programme, The Great Recovery

The Great Recovery has made over 40 films in its four year programme, which have been watched more than 50,000 times. These tell the stories of our visits, workshops, explorations, and interview many stakeholders around the circular network who help shed light on the challenges of the circular economy. Much as we would like to we couldn't take everyone with us on our visits but a pithy 3-minute film can reach a larger, broader-based audience through social media and channels such as YouTube, and by means of visual and audio messaging can have greater impact than a written report in PDF (though we did these too). Through the medium of imagery and film, we have presented the ‘human’ implications of a circular economy more directly, considering questions like: Do people think it will be easy to take apart a product? How do they feel about redesigning a business model? What is their reaction when they confront a pile of discarded products – not just in words, but in body language, tone of voice and emotional charge?

In order to feel empowered to create a more circular economy, people need to feel that they are part of a wider movement of change, and that their personal predicaments are common challenges. Our most popular clips invite the viewer to learn alongside those in the film, to experience the frustrations and obstacles that stand in their way, and to overcome these together with them. Building the skills and confidence to risk disrupting the status quo requires positive and affirmative messaging; negative stories demotivate people, but a message of collective challenge and opportunity can inspire and enthuse them.

*All our communication became design focused in its application which lent the project a more human aspect and invited new participants to join the movement in a more active, creative and challenging way.*

**The Great Recovery in numbers:**

Twitter followers	5,750
YouTube video views	52,538
Minutes of YouTube footage viewed	107,767
GR workshop and event attendees	978*
Fab Lab visits	12,000
RSA Fellows	>27,000
Mailing list	2,200



**A better understanding of important perspectives**

*For Restart it's been very valuable to be part of a larger network. I had some pretty intense conversations at The Great Recovery's launch event about the case for upgrading and repairing products as opposed to throwing them away. It was the 'sounding board' that inspired me to push for more openness, and since then we have developed our own proposition as we realised more and more the importance of giving people the right to repair.*

*The Great Recovery has showcased our work and helped us to build valuable new connections with people who are interested in citizen-led repair. It brings together layers of people - from designers to practitioners - which brings a better understanding of these diverse and important perspectives.*

Ugo Vallauri, Co-Founder Restart

**Democratising the circular economy**

*The Great Recovery hooked me in with its innovative thinking and engaging, nicely packaged content. I hadn't realised how important design was, but by highlighting it you are giving circularity a much wider remit and moving on from waste. With things like the short videos and the Circular Train Game at Resource you are 'normalising' the circular economy: we need The Great Recovery to make these things cool and desirable.*

*The 'Rearranging the Furniture' report done with SUEZ looking at bulky waste was so accessible. It set out the opportunities and areas we need to work on, and my business mind started thinking 'what do we need to do next?'*

Daniel Connor, CEO & Founder, WarplIt

## Demonstrating design as an effective tool

*The Great Recovery came just at the right time: it cut through the verbiage and bluster surrounding what is quite a simple concept, and enabled us to show how design is the single most effective tool in achieving a more circular economy. The early workshops were practical: starting with the problem and immersing the designer in the waste they designed; then building up to product disassembly and redesign, and finally reimagining business plans and service delivery. Working across the system shows the ugly side as well as the opportunities, and The Great Recovery was revolutionary in its ability to present, engage and act.*

Mark Shayler, Director of Ape and facilitator for The Great Recovery



## A visual project that is very human and highly accessible

*Colleagues in the creative industry were surprised that I'd joined The Great Recovery team as filmmaker. I was actively discouraged from doing it. 'Sustainability is boring', 'How will you bring it to life?', 'No- one will watch the films' were just some of the comments I received.*

*Right from the start I used a familiar format to pull in more general audiences and to amplify the messages. It was also important to keep the videos at a human scale: "How does this make you feel?", "Why should we care about this?" What are the key questions that help the audience connect with, and better understand the subject of the films, namely waste.*

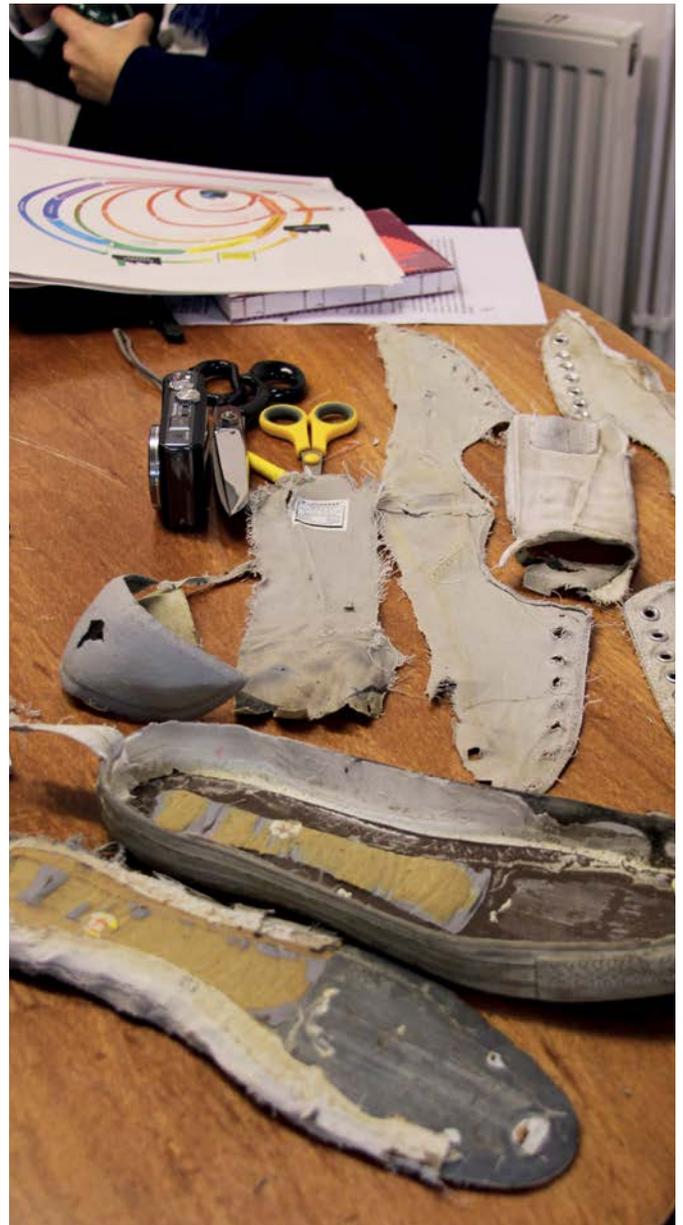
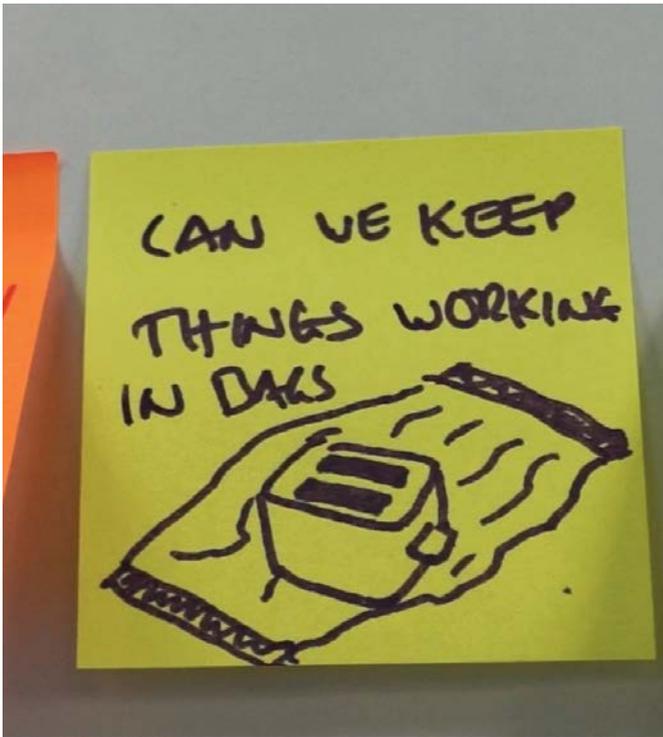
*Statistics for The Great Recovery YouTube channel show how viewers will often press the "save for later" button when the films are released and then watch them via a smart TV. Statistics also show viewers repeat watching our content and actively engage with our long form content. "The Tipping Point" film for example is over thirteen minutes long and has an audience engagement of 87 percent, which means these viewers watched it from the first second of the film to the very last.*

*We made 'The Survivor Sofa Story' as a commission for The Community Channel and it's now on BBC Iplayer. It has also been accepted at over twenty global film festivals.*

*Most broadcasters will tell you that sustainability is hard to make 'sexy' or interesting to a general audience. But this highly visual project has managed to circumvent all of that in a very human and accessible way.*

Paul Wyatt, Film Maker and Media Design Consultant





### Simplicity of concept resonates

*The Great Recovery's simplicity of concept and communication has always been very strong: watching the videos and seeing other people going through various realisations about design and waste really resonated with me. I was trying to understand waste and resource systems better at the time, so The Great Recovery certainly contributed to my learning journey. It has also been useful in pushing forward an agenda for the re-use of assets on our estates - giving me the confidence to be able to sell these ideas to other teams internally. It has shaped my thinking on how we can support our manufacturers around resource use: considering not just energy and water, but waste, resources and many other aspects.*

Sarah Wakefield, The Co-operative Group

# 8

## Make space for testing, failing & prototyping



Since opening Fab Lab we have had over 12,000 people through the door from all different sectors. They start by wanting to know about digital fabrication, then begin to realise the links between this and some big environmental issues. They start to think about what happens to their creations at end-of-life and through the partnership with The Great Recovery we can introduce ideas on how they can re-use components rather than just recycling or landfilling.

Tony Fish,  
Fab Lab London

In 2014, The Great Recovery embarked upon a new collaboration with Fab Lab London, an urban fabrication laboratory from the global network initiated by MIT. The hub opened in the heart of the City of London. Basing the team here a couple of days a week gave us access to a whole new network of disrupters, innovators, makers and entrepreneurs who were doing things a bit differently, as well giving us creative space for workshops, and a home for our materials library.

*We learned early on that businesses wanted practical, neutral space in which they could test ideas and build new relationships in a place where it was OK to fail. Our partnership with Fab Lab offered such a 'safe fail' space which brought with it a new network of disrupters, entrepreneurs and makers.*



## Case study: The Circular Economy Innovation Space:

*The thinking behind the The Great Recovery / Fab Lab collaboration was fivefold:*

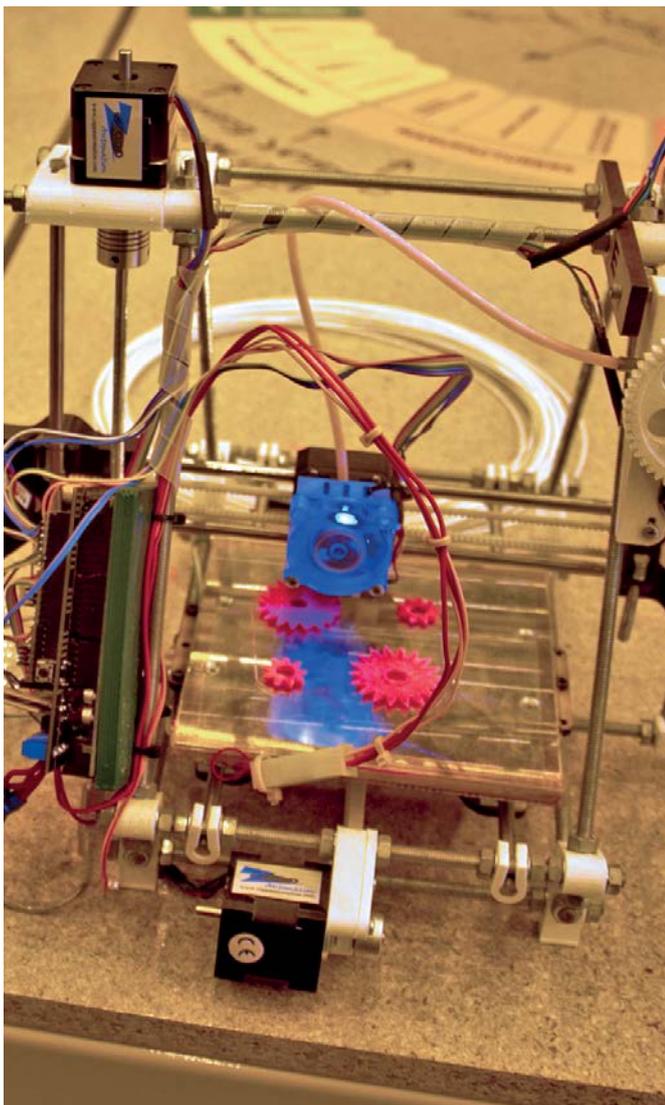
*1. Rapid Prototyping: Designers and businesses need to print out, test, put together, take apart and bring to market quickly in order to get a fast, iterative design process going. Fab Lab has the equipment to enable this to happen.*

*2. Knowledge sharing: Growing knowledge across the Circular Network is essential if we are to achieve system-wide change. The Fab Lab is a melting pot for creative and disruptive thinking, whilst The Great Recovery helps increase understanding around the circular economy for all those that visit the lab.*

*3. Fixing and customisation: Encouraging re-use by fixing, hacking or customising an item increases utilisation and makes the most of the embodied energy from initial production. Fab Lab have the additive (3D printer) and reductive (laser cutter) kit to enable and open-source these activities, which are also key to reducing wastage.*

*4. Re-thinking material streams: Where we see a broken down product and only scrap material value, those that 'hack' materials and electronics in a Fab Lab may see valuable components that do specific and transferable tasks. For them opportunity lies in the building blocks that can be reutilised in new applications.*

*5. Unlocking information flows: In order to understand where our stuff is at any given moment, and get it back for re-use or repair, we need to develop sensor-driven tracking data. Fab Labs are hotspots for Arduino and sensor technology development, and circular thinking needs this to help unlock data flows that accompany our products.*



## Appealing to the possible rather than the improbable

*The Great Recovery project has enlightened, challenged, explored, connected and inspired. For the team it has been a momentous journey of discovery, and has been the means of introducing us to some extraordinary people and places. What other project allows you to go from advising the Scottish Parliament to tramping round a fridge dump with a bunch of wide-eyed students in one day?*

*It is only when we look with new eyes at the complexities of 21st century existence and start to see environmental problems as human problems that we will begin to change our behaviour and our systems. The Great Recovery, with its colourful design focus, its ability to address all sectors from one platform and appeal to the possibilities rather than the improbabilities, has started to inspire that change.*

Lucy Chamberlin, Head of Programme,  
The Great Recovery



## Attracting the creatives, the makers and the disrupters

*The Great Recovery has been able to curate events that attract people who are not of the traditional 'church' of sustainability but are those that are interested in connecting with the creatives and disrupters who come to fabrication labs. This has been great for both organisations; we could have ended up with a big bias towards white male engineers, but The Great Recovery has diversified that and introduced us to new collaborators.*

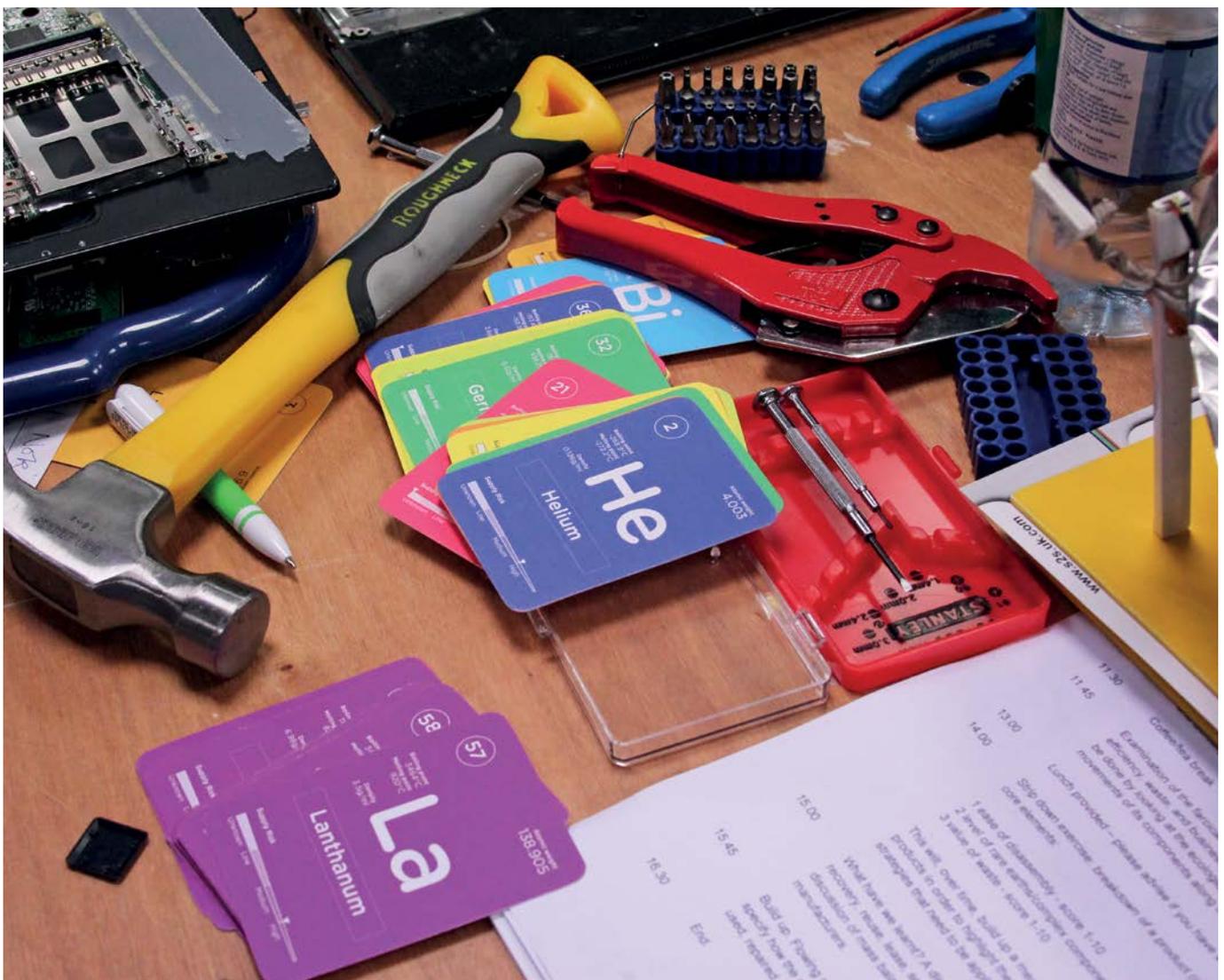
Ande Gregson and Tony Fish,  
Co-Founders and Directors, Fab Lab London

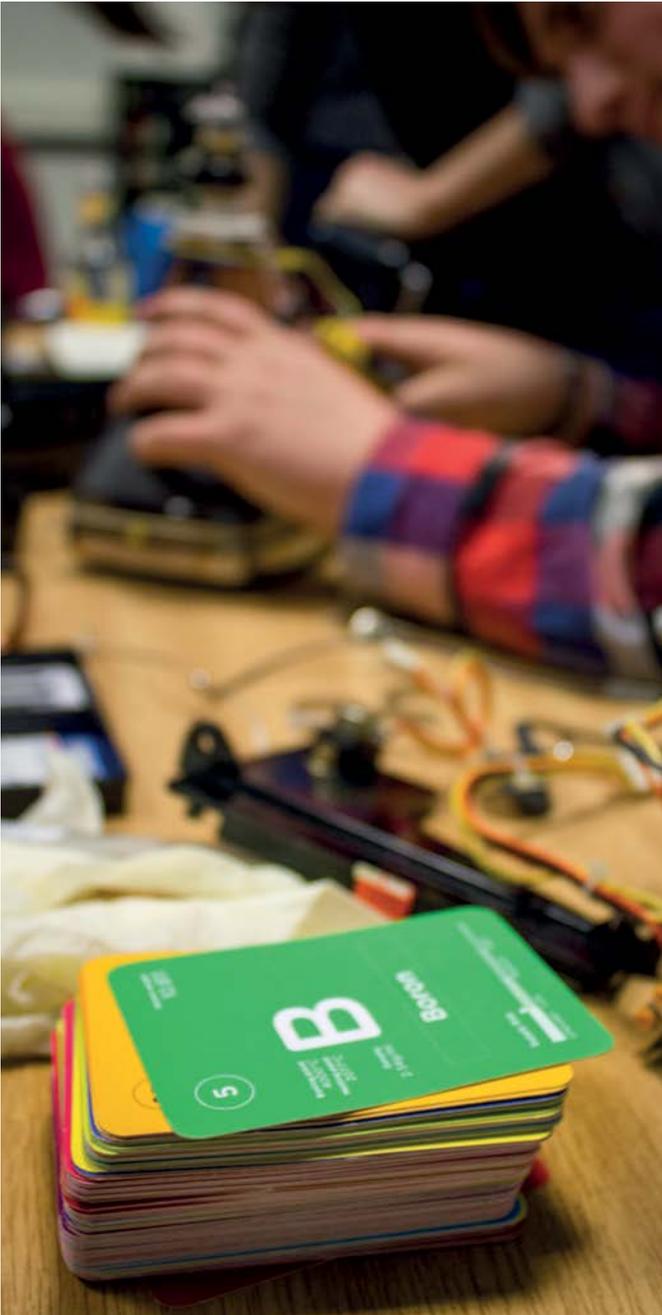


## Walk in and immediately get involved

*Having Fab Lab as an open access space and community hub is a big advantage as people can just walk through the door and get involved.*

Liz Corbin, Institute of Making, UCL





## A supportive team of expertise

*Through The Great Recovery and Fab Lab I have been able to develop my circular project design theory, relying heavily on the expertise of the team to give me a deeper understanding of everything from 3D printing to the challenges faced by manufacturers. During my time at Fab Lab I have slowly begun to understand the machines, the software, and materials, and therefore to realise the holes in my initial project aims. When facilities and spaces are incredibly hard to come by, the Fab Lab is a great way to encourage immediate creativity and design development of circular products.*

Sophie Zajicek, Designer, Great Recovery resident



# 9 Experiment & redesign



**The real triumph is that we regularly encounter people who have totally changed their design practice, their manufacturing strategy or their business model due to The Great Recovery. It continues to have a knock-on effect.**

Nat Hunter,  
Director, Machines Room, previously  
Co-Director of Design, RSA

As well as allowing people to get in to the 'nitty gritty' of how stuff is made through The Great Recovery's series of workshops and network events, we also developed more in-depth insight based design residencies. These longer, deep-dive programmes take teardown and design-up methodology to the next level by providing smaller groups of designers with a more comprehensive exploration. They are focused on observation and insight around specific sector challenges and look at waste, re-use and design for circularity. Our aim is to focus on the 'design-up' process and expose these designers to the challenges of implementing the circular economy. This process has been documented in our report 'Rearranging the Furniture', supported by SUEZ, available on

[www.greatrecovery.org.uk](http://www.greatrecovery.org.uk). The Fab Lab has been used extensively by The Great Recovery for redesign projects. A series of 'Fab Fridays' free events explored subject like plastics, textiles, electronics and food waste and our 2015 'Re-Design the City' residents developed their circular economy projects for prototyping and testing.

*Through our workshops, events and design residencies we have learned to take an experimental approach, without taking an authoritative position of offering up our own solutions. We have allowed for the emergence of new and unexpected outcomes from our action based learning, because you never know what a teardown or conversation will uncover.*

## Case study: a design residency on furniture, fabric and fire labels

*What started as an exploratory 10-day residency programme supported by SUEZ for four designers grew to become a project of passion which is still evolving more than a year later. Having set out to gather insights on the waste streams of furniture and other bulky items by visiting amenity and recovery facilities and speaking to those working 'at the coal face', our designers came across a two-year-old sofa that had been relegated to landfill because it was missing its fire label.*

*This sofa took them on a journey of discovery that involved looking into business and re-use models, researching fire regulations, and taking the sofa apart to explore material streams and design. Noticing the sofa's story on our stand at Resource 2015, the fabric manufacturer Camira joined in and worked with our designers to develop some suitable fabric (made from suppliers' waste material) in order to reupholster it.*

*The next step in this journey was a pavement slot at Clerkenwell Design Week, where we engaged*

*members of the public in the re-upholstery process and used it as a communications piece to talk about the importance of circular design. The sofa has been exhibited both at the RSA and at Camira's showroom as a physical representation of material streams in a circular economy and the power of collaborative enterprise.*

*Camira are now retailing the 'waste' fabric in their shop, and are working on another project with one of our designers (see below) who is giving new life to a whole tranche of old furniture.*

*The short film made about the residency has now expanded into a 30-minute documentary being shown on national TV (the Community Channel), and the project has also been featured on the BBC magazine and the Today programme.*

*None of these outcomes were originally envisaged as part of the residency: they all came about as a result of being open to new suggestions, tapping into our network, and taking risks that others avoided.*



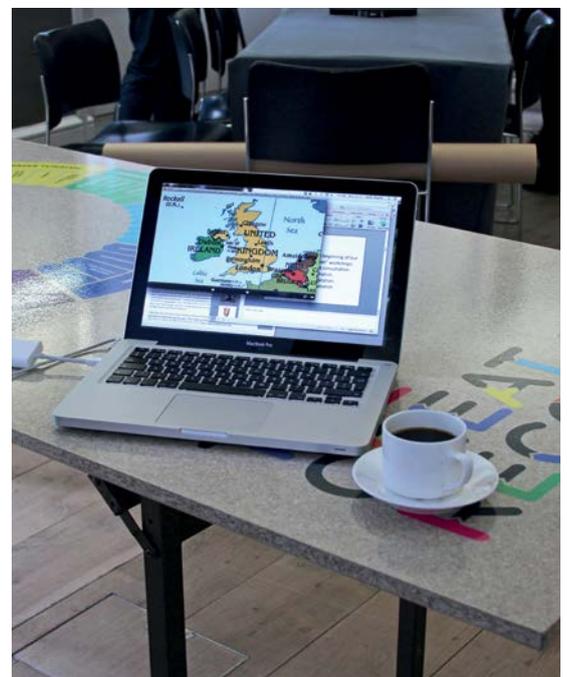
## A focus back to designing with material appreciation

*In recent years I have become increasingly aware of my own design 'excess' and interested in supporting a shift away from throw-away culture, back to material appreciation. I believe designers can help by questioning and playing with ideas and themes and helping communicate to the public that their waste could be another's treasure. I loved working on the residency as I was able to learn so much, share ideas with others, and get some space from which to come back to my own business. It also connected us to an incredible network of waste managers, retailers and charities that are championing re-use.*

*The Great Recovery is like the messenger: supporting designers and spreading the word and keeping the ideas bubbling. The more designers connect, communicate and share, the better we can manage the changes required to design out waste.*

*Now I am sharpening the focus of my own company to be more circular. We are working with a company to re-upholster furniture for a trade show that would otherwise have been thrown away, and we are using the Camira Survivor Sofa fabric to do it.*

Ella Doran, Designer and Entrepreneur



## Concrete deliverables

*Any successful articulation of the circular economy needs to join up both ends of the supply chain – specifically, designers, manufacturers and retailers with organisations that collect and manage discards. The Great Recovery has been an ideal platform for this. The quality of its work is high, its profile is high, and the programme is able to show concrete deliverables. The Survivor Sofa project stood out precisely because it enabled these supply chain discussions to happen. It highlighted the sheer profligacy of our purchasing and consumption habits, and the inefficiencies inherent in each part of the chain – collection of discards, logistics, ease of repair and deficiencies in design that mitigated against reuse of an otherwise perfectly functional discarded item. The recommendations that the project made and which are relevant to our operations are being studied and actioned – such as training recycling centre staff, providing incentives to raise re-use rates, etc. Many of these recommendations are also being examined by the household waste recycling centre working group facilitated by Defra.*

Gev Eduljee, Director of External Affairs,  
SUEZ Recycling and Recovery UK

## Case study: a workshop on Oil and Gas Decommissioning

Working with Zero Waste Scotland, The Great Recovery investigated the opportunities for increasing levels of re-use in the North Sea O&G

decommissioning sector. The report: 'North sea oil and gas rig decommissioning & re-use opportunity' can be downloaded on [www.greatrecovery.org.uk](http://www.greatrecovery.org.uk).



### From niche discussions to a wider global debate

The open access exposure to the wider industry takes it from being a niche discussion to something that people will consider and utilise in the wider world.

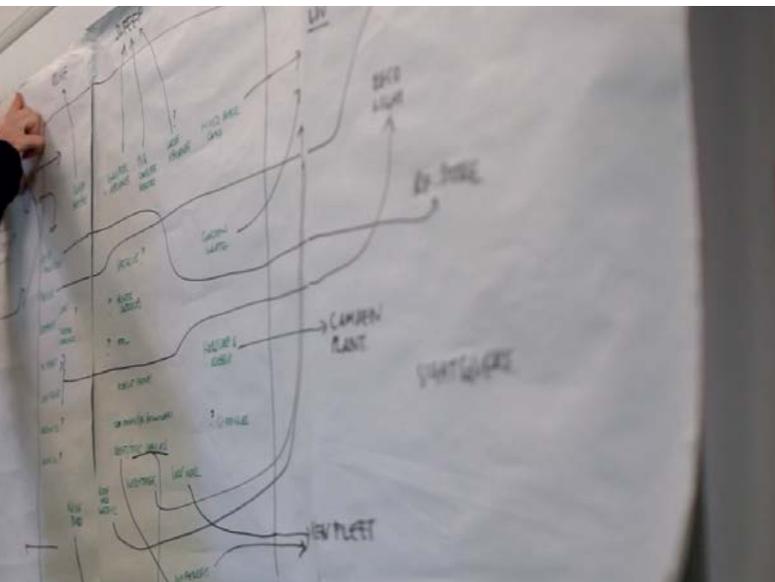
Claire Potter, Designer and Lecturer at University of Sussex

### An important lynchpin project

The Survivor Sofa project was a stand-out for us. In co-developing the fabric for the recovered sofa, The Great Recovery team helped to push the boundaries of using the waste to see how much recycled content we could incorporate into the product. We are now starting to manufacture it for sale to our customers, and have even dubbed the fabric range 'Survivor' in reference to the project.

The Great Recovery has many strengths and is such an important lynchpin for the development of the circular economy. Bringing people and organisations together and enabling communication across industries and between designers, manufacturers, recyclers and policy makers, is integral to building a future economy. By connecting me with different individuals from all kinds of organisations I've really been able to look at the bigger picture when it comes to circularity, understanding things not just from a manufacturing point of view but also from waste managers, recyclers and policy makers; it is important to incorporate these considerations into our future projects.

Paul Arnold, Sustainability and Innovation Manager, Camira Fabrics



# 10

## Push for policy & reform



**Organisations such as Innovate UK, and programmes like The RSA Great Recovery are crucial not just as a means of ‘correcting’ market failures in the form of insufficient innovation within the UK economy. They also have a vital role in creating a vibrant ecosystem of connections and supportive institutions which can help the spread of sustainable innovation and expertise, and help create new markets for sustainable manufacturers.**

Manufacturing Commission  
Industrial Evolution report, 2015

Over the four years The Great Recovery’s profile has grown significantly. We have built up an invaluable network of partners and collaborators. Our focus on collecting evidence through action has led us to put design at the forefront of circular economy thinking, and the UK as trail-blazers in this field.

*Our starting point has been to understand how the advocacy work done by those working at the theoretical scale of the circular economy could be adopted and implemented by the design community. Approaching this through our learning methodology meant we moved quickly into the details, often focusing on how materials were being specified or what design element could change. This unique perspective has helped us explain the barriers to a circular economy.*





## Engaging and inspiring diverse stakeholders

*The Great Recovery provides a verve and impetus to projects to ensure they are delivered with maximum effect. The team engage and enthral diverse stakeholders and have been able to influence the Oil and Gas decommissioning sector through their thought-provoking and inspiring report. A recent design workshop was also tremendous, and brought together key stakeholders from different industry sectors to consider the importance of design in a Scottish circular economy road map.*

Maurice Golden, Circular Economy Programme Manager, Zero Waste Scotland

## Highlighting required people and competencies

*The Great Recovery's strong design centric approach offers many good case studies and resources on how design has to change and what that means for companies, in terms of competence and collaboration. The first report opened up a cross-disciplinary design approach that is fundamental, instead of viewing the circular economy as a resource management issue. This gave a good starting point for our work, to understand what the crucial processes are, and most importantly the people and competences needed for a successful circular economy development programme.*

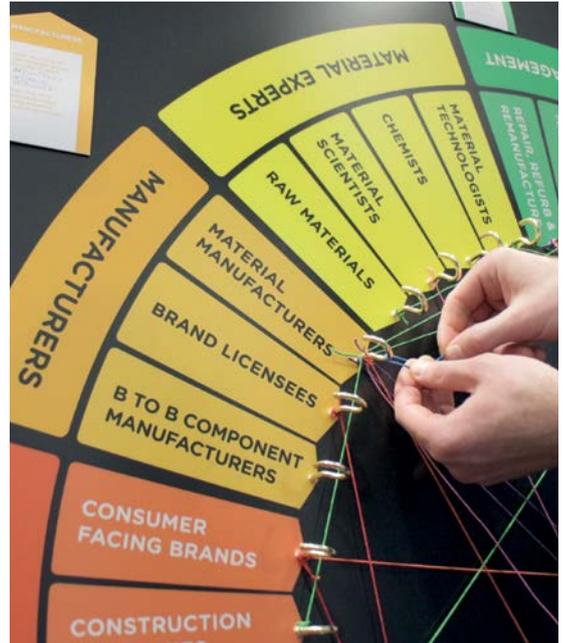
Paula Fontell, Co-Founder of Ethica Ltd

## Inspiring new perspectives

The Great Recovery gave us the inside track on textiles reuse and recovery, and investigated a new initiative to give a second life to our corporate uniforms. We have now set up a take-back programme, are moving to removable branding and are looking to work with a social enterprise to help us sort old clothing items so we can maximise re-use. We are setting up measurement programmes for all our waste, exploring a closed loop for our paper, have changed our criteria for new supplier tenders to make circular economy a priority and are actively exploring more 'products as service' solutions, such as our lighting.

The work of The Great Recovery has inspired our employees and many others by giving them the opportunity for hands-on activity that causes them to see things differently.

Bridget Jackson, Director of Corporate Sustainability, PwC UK



## THE GREAT RECOVERY GAME OF CIRCULARITY

Where the Engine of Design takes on a network of companies...  
Imagine that you are the manufacturer of a range of products. You must design your products to maximise your profit (points) whilst reducing the cost of production, taking into account profit, waste and material impacts, you must design your products to achieve the best possible circular outcome. In each scenario, we will challenge you to maximise your profit (points) whilst reducing the cost of production, taking into account profit, waste and material impacts, you must design your products to achieve the best possible circular outcome.

- 1 First, choose a product to go in your train:  
**Sofa**  
**Washing machine**  
**Jeans**  
**Mobile phone**
- 2 Nov  
The  
of  
ez  
p  
a  
c
- 4 Materi  
century  
plastic
- 7 Once they have reached the **end of their life**, the products can take very different routes.
  - Will they become waste, burnt in an incinerator or buried in a landfill?
  - Will the materials be recycled, shredded or melted and made into new materials?
  - Will the component parts of the product be reused in new applications?
  - Will the products themselves be reused through a rental or lease model?
  - Will the products be passed on intact, entering seamlessly into a second life?

Spin the waste randomiser to find your landfill tax multiplier. Then uncover your final score...

## Speaking clearly to practitioners

*From the outset The Great Recovery has set out to fully understand how design is integral to a circular economy process, which speaks so clearly to me as a practitioner. The tools and reports have been invaluable in both my own practice's work and in my role as an educator.*

*The University of Sussex now has a 'Role of Design in the Circular economy' module which demonstrates to the students that decisions they make from specification all the way through to realisation really impact the rest of the life cycle of the product, and this understanding leads them to radically change their thinking.*

Claire Potter, Designer and Lecturer  
University of Sussex

## Pushing for closer collaboration

*I have been inspired by The Great Recovery's work to bring an important issue of design and consumption into the public arena. I find it worrying that so many products are being designed to be out of fashion within a couple of years, and I think designers and manufacturers need to be the ones driving change in this area. Part of the issue is that consumers, and even parts of the industry, aren't aware of the huge waste of resources that occurs in the process.*

*The Great Recovery project highlights the issues surrounding 'take, make, dispose' manufacturing and argues for closer collaboration between designers and those in different parts of the manufacturing and disposal process. This can help all involved to better understand how products can be designed in such a way to make the best use of resources, in both the short and long term.*

Paul Priestman, Director, PriestmanGoode

## THE FOUR DESIGN MODELS

By exploring the practical possibilities of design for circularity, we have identified four main strands that fit within a circular economy.

### Design for longevity

This is the way we used to design things: for long life and fixability. Products can be easily taken apart for upgrade or repair, and are well crafted and reliable. Users place high levels of trust in these products and are emotionally attached to them, increasing the likelihood that they value them for a long time and then pass them on to another owner rather than throwing them away.

### Design for leasing or service

The product-sharing business model is becoming more common as leasing is seen as an alternative to ownership. It allows for higher specifications of design and materials that increase life and durability. The material stays in the ownership of the manufacturer as the product is never sold, so value is kept within the system.

### Design for reuse in manufacture

These business models and systems support the return of old products to manufacturers so that they can upgrade or replace components, fix and resell them. Reverse supply chains and effective legislation are important factors in remanufacturing. These products need to be designed for easy factory disassembly in order to increase their material utilisation.

### Design for material recovery

Products in this outer loop can be reprocessed - recycled - into new materials. These procedures can involve intensive recovery methods that extract the most value currently available. Design for fast-flowing recovery and to reduce multi-material complexity.



## Proactive and inspiring

*The Great Recovery has supported and helped further our work towards achieving a circular economy through the proactive role they played in initiating engagement with the UK Environmental Law Association (UKELA), bringing in key stakeholders and hosting one of a number of meetings to help identify real and perceived legal barriers in moving towards a more circular economy and looking for ways in which these might be addressed. This links in to other work we are doing, for example around the definition of waste.*

*Engagement with the design sector is a key strength of The Great Recovery project, as is its use of extensive networks and effectiveness in bringing together different stakeholders to tackle shared challenges from different angles. The team is proactive and inspiring - educating various audiences, sharing innovative new ideas and helping to make this whole subject area exciting and appealing, especially to young designers and buyers.*

Simon Johnson, DEFRA

# Reflections & recommendations

The Great Recovery has brought a very distinctive design perspective to the challenge of transitioning from a linear to a circular economy. We have introduced design thinking and design process into our investigations with Innovate UK and all the partners we have collaborated with. This has allowed our partners to get new insights into how that transition might take place.

Our role has been to convene the wide network of organisations and individuals who are influential in the creation and disposal of our products: designers, manufacturers, suppliers, waste companies, policy makers, regulators, scientists and others. Insight and commitment from all of them is crucial in understanding the design decisions that impact on the end of life of products and materials, and in redesigning products around circular economy principles.

Working with cross sections of our network we have investigated opportunities for this redesign of products and business models: examples can be found at [www.greatrecovery.org.uk](http://www.greatrecovery.org.uk) and in our publications, detailing our research into bio-economy opportunities in the Orkneys, the development of a circular economy approach to the Decommissioning Oil and Gas assets from the North Sea, and our design residency investigation into issues in bulky waste. Core to The Great Recovery has been supporting

Innovate UK in their work promoting innovation in circular economy through design: providing support, connections, advice to the applicants of their design challenge and competitions. Finally, we have worked with the RSA's Student Design Awards and with universities and educators to raise the profile of the circular economy in education.

Our approach throughout has been practical and hands on: harnessing the power of learning through doing and of visual communication: we have enabled thousands of people to experience and understand what happens to products at their end of life, and to reimagine them for a circular economy.

We have been continually buoyed by the passion and capacity of the network to make the sea change needed for us to move from our current 'take, make, waste' systems to an economy in which resources are not wasted and valued in line with planetary boundaries. We must not underestimate the challenges which currently block the way but we conclude this project with both a firmer commitment to the need for this change and a stronger belief in the capacity of society to make this transition.



Looking to the future of the circular economy, we hope the lessons we have learned and the expertise we have gained will be scaled up, taken into businesses and communities and tested and refined through practice and iteration.

### Build networks & support conveners:

New relationships breed new thinking and break up the invisible silos that exist within industries, businesses and political entities. They enable people from sectors as varied as design and waste to teach, learn from and understand each other. It is the role of the convener to act as a catalyst for brokering new these dialogues and collaborations between diverse sectors. Indeed, creating these connections to form networks built around knowledge sharing has been shown to be one of the most significant roles of The Great Recovery programme.

Research bodies, trade and government organisations should partner to replicate and scale the convening role played by The Great Recovery in order to broker network relationships, catalyse diverse partnerships and creatively engage network sectors through a range of experiential and design focused events and media.

### Create physical space:

A network requires access to neutral spaces in which to operate and have face-to-face interaction. These places represent 'safe spaces' for difficult conversations, for prototyping new methods, for experimenting and failing and evolving to experiment again. By their nature they should be the open-source physical places which bring contributors the mental space in which to think creatively and act spontaneously. The Great Recovery's space at Fab Lab London provided 'neutral territory' in which we could bring together cross sector participants to share learning and insights, and to test and develop new designs. It is centres of learning and innovation like these that the circular economy movement so urgently needs in order to bring together its diverse practitioners at a pre-competitive stage and to set the direction of travel for a new global economy.

Universities, maker spaces and interested commercial partners should collaborate to develop and invest resources in a physical 'hub', based on the make-space concept and dedicated to the circular economy research, design and development.

### Support and promote new skills

The skills that must be developed in the new circular economy are not those which can be picked up from books or by rote. They are new behaviours, new ways of collaborating and new ways of seeing. And for these to be learned and ingrained, they must first be tested and actively encouraged. The Great Recovery's tangible methods such as teardown workshops and site visits have inspired new ways of thinking in participants, and led to new ways of acting. The mutual learning that comes from convening organisations and individuals with very different experiences has sparked some unique insights and associations. Through events, films and other resources The Great Recovery has been able to pass on knowledge and skills, and to enable other practitioners, from academics to business leaders, to pursue circularity in their own field of expertise. At the RSA we continuing our research examining current teaching practices in the design for a circular economy.

Universities and education organisations need to develop circular economy education programmes and curricula, incorporating action-based learning, that can be tailored for schools, universities, colleges and make-spaces around the UK.

Closer links with the design and material development sectors and resource management should be fostered through a programme of design residencies funded through business partnerships, waste trade organisations and government programmes.

### Support Research & Development

Whilst there are general principles and approaches that need to be adopted across all industries to facilitate a transition to a circular economy, every sector will also have to find its own practical solutions and best way to transition. It is therefore vital that all sectors receive ongoing and adequate investment and support for insight discovery and Research and Development. Through our engagement with businesses, including with the applicants to Innovate UK's design challenges, we have seen the benefit of 'safe fail' investment into areas where there is potential gain but proof of opportunity may be required, or where the gain may be in the longer term and less attractive to private investment.

Through Innovate UK and other funding models, the UK government should continue to support and promote a programme of innovation-focused competitions in each sector and in cross level challenges to fuel new business ideas and enable cross to enable 'leap frogging' in the R&D stage through knowledge sharing and collaboration.

## Promote redesign in action

The Great Recovery’s approach to hands on learning and insight gathering has teased out key insights across a range of products and sectors. We strongly believe that this creative approach is vital for not only engaging the design community in the process, but in identifying and acting on the challenges it throws up. This ‘micro, back to macro’ level of insight will help in addressing market failure, as the breadth of these challenges vary in scale and detail. They include failures in waste infrastructure to facilitate reuse and recovery of present day material streams, through to the end of life strategies for new materials coming to market. Having a design focus on these barriers can shift the thinking and find innovative solutions.

Government and trade organisations need to build on the work of The Great Recovery and the insight learning design methodology to enable networks to move quickly towards action focused prototyping. The focus should start at end-of-pipe destinations for products and materials to identify barriers and opportunities that are currently in play and that are slowing the progress towards a circular economy. Investment must be allocated to support these investigations. For example, European and government incentives that have been very successful in reducing waste to landfill need to be redesigned to support recovery and reuse.

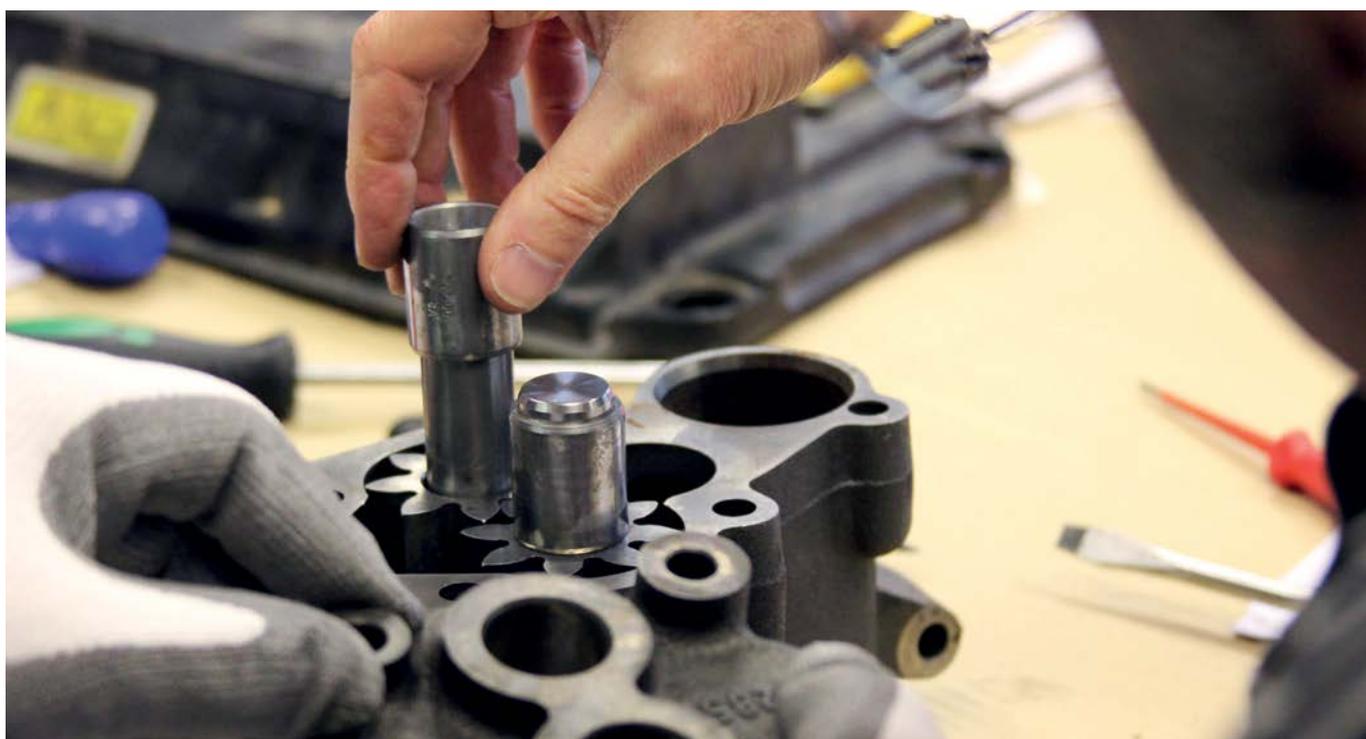
## Build the evidence base

Valuable information that we need to support the case for moving towards a circular economy is still missing. It is vital that there is collective understanding of the current availability of materials that are needed to enable growth, for example to build our projected housing stock requirements in the UK, and of the material and waste streams resulting from these actions.

A cross-sector evidence gathering exercise that allows business and policy makers to understand the future resource need versus waste created (mass balance) throughout the UK would allow those working towards a circular economy to understand where opportunities lie and where urgent R&D is needed. These sector by sector material flow analysis studies will not only act as bench marks for understanding demand in recoverable and recycled materials, it will identify where innovation or additional support is needed and help inform the recovery plans for new materials not yet in mainstream use, graphene for example.

Acting as the convenor, government and trade organisations should launch a UK cross-sector evidence gathering exercise that compares raw material demands and waste created (mass balance) to understand the impact of predicted future resource and the waste streams this will create.

A similar comprehensive analysis and collation should be commissioned, within different sectors, of the legal and legislative barriers and opportunities as seen through the lens of the Circular Economy, starting with those that have greatest opportunities for reducing current waste production, and for incorporating circular design principles, for example the construction sector.



## Enable behaviour change

The Great Recovery has given people a 'hands on' experience of the making and disposal of their products, an approach we committed to because it results not only in the gathering of insights by these participants, but, we believe, the process itself acts as a call to action. Activities, such as tearing down a product or visiting a waste site, enable participants to both truly understand the challenges and galvanize their own resolve to help make the changes needed - something we have seen many times throughout the project, even in the most stubborn of sustainability non-believers.

Enabling people to 'look inside' products and their systems, both physically and via the increased sharing of information, is key to empowering all those involved in the network to actively play their roles in enabling truly good circular design. This is crucial because changes in behaviour and attitude must be something we all to commit to: products suitable for a circular economy cannot be

developed if the responsibility resides solely in the hands of the designers. Leadership from business, civil society and especially from government is required to support and amplify this message - the phrase 'I will if you will' holds true.

National campaigns, supported by government, trade organisations, the third sector and businesses, should engage the circular network through creative public programmes that tell the stories of our products, and show the massive benefits that a shift to a circular economy could bring. These should explain, without dumbing down, what role each part of the network must play in order that the system maximises the value of the material flow.

UK and EU Government must commit to supporting the move towards a circular economy by building a palette of policies, investments and support systems that actively enable all positive behaviour change from all actors in the circular network.



The RSA (Royal Society for the encouragement of Arts, Manufactures and Commerce) believes that everyone should have the freedom and power to turn their ideas into reality – we call this the Power to Create. Through our ideas, research and 27,000-strong Fellowship, we seek to realise a society where creative power is distributed, where concentrations of power are confronted, and where creative values are nurtured. The RSA Action and Research Centre combines practical experimentation with rigorous research to achieve these goals.

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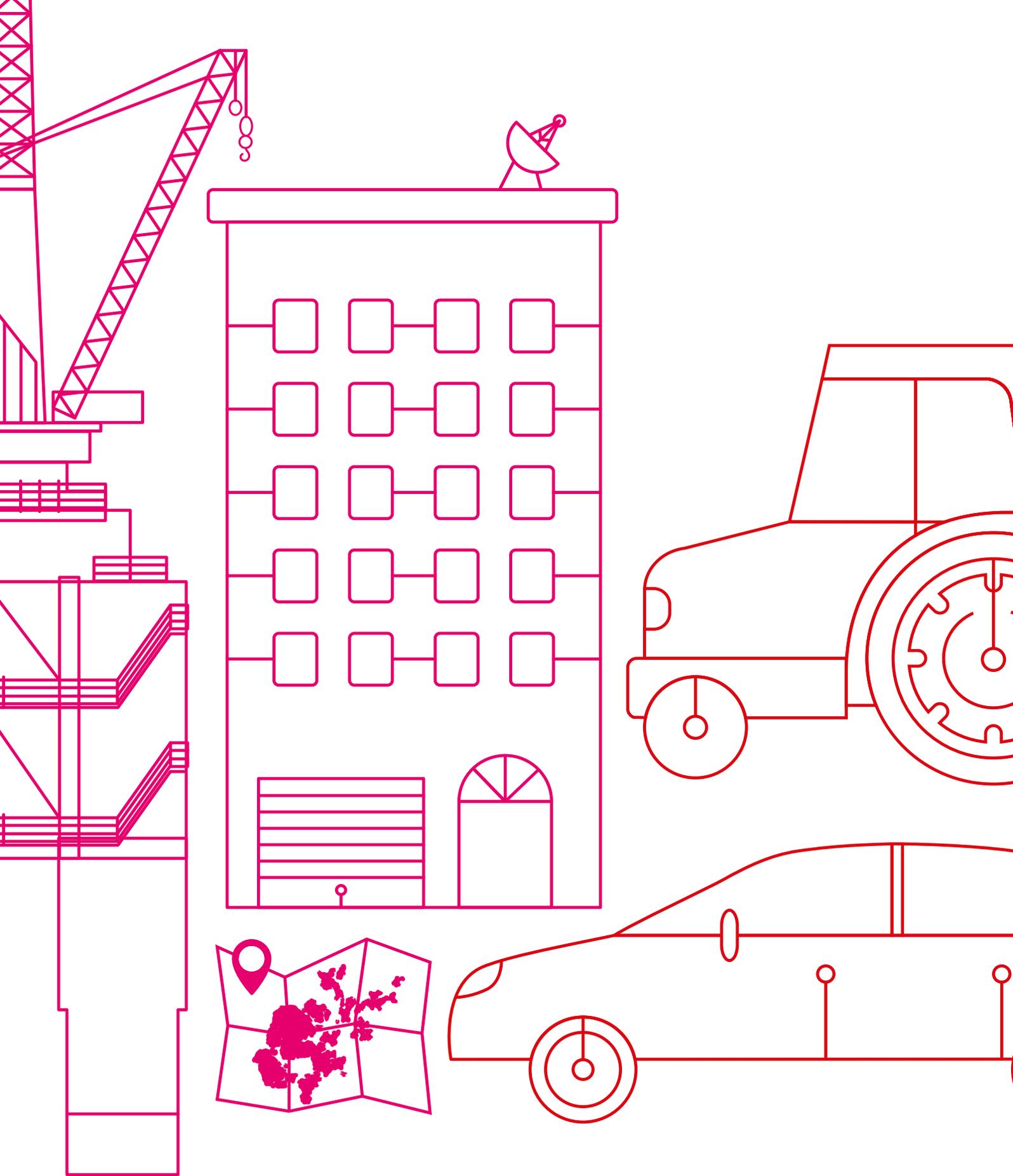
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