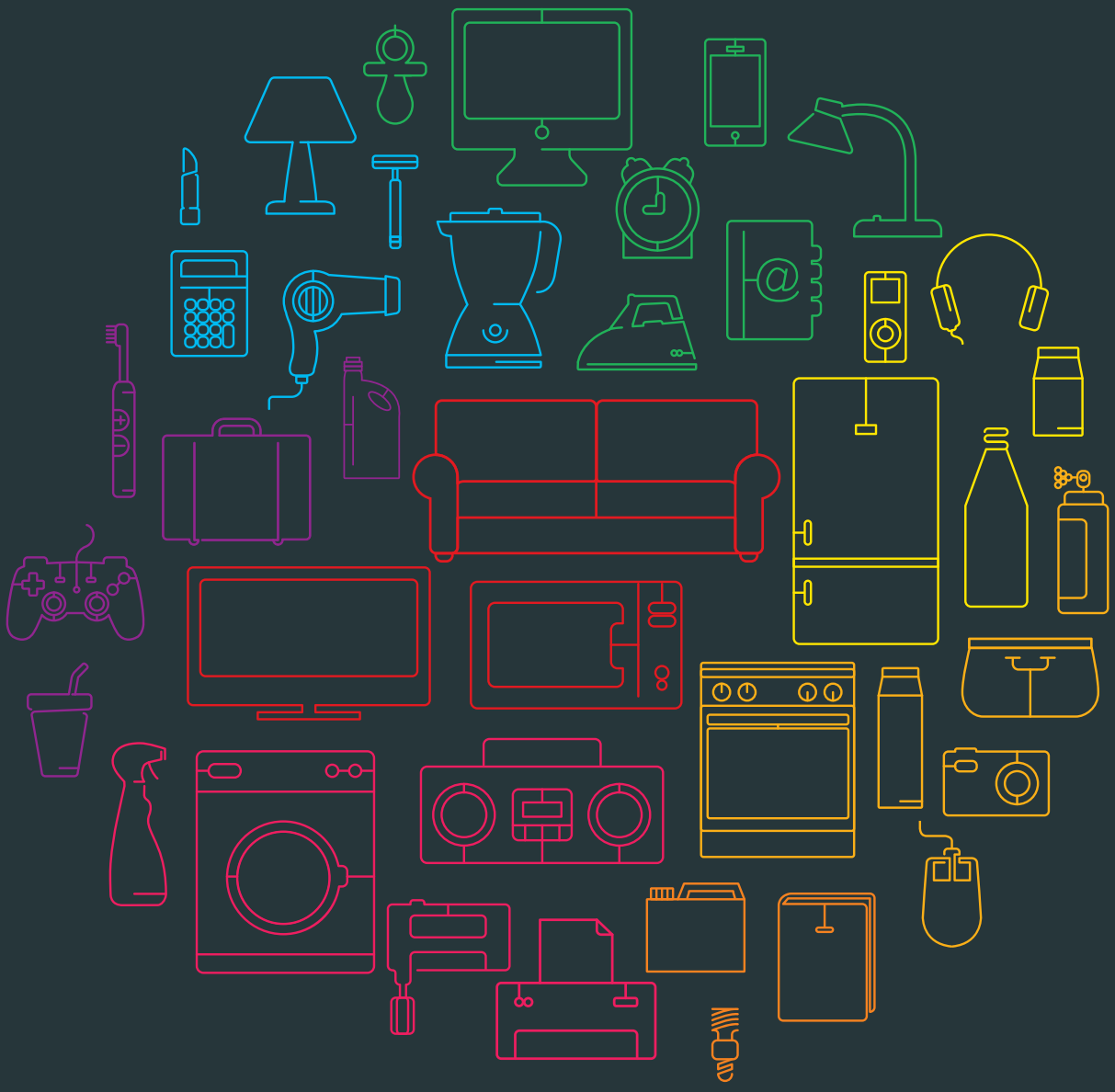
Rearranging the Furniture

An RSA Great Recovery Design Residency in collaboration with SUEZ Recycling and Recovery UK



RSA | THE GREAT RECOVERY

> I like to think that what I design stays in someone's home for ever, but in reality it does have an end of life

Ella Doran
Product Designer

Contents

Summary

Every year in the UK we throw out around 1.6m tonnes of furniture and bulky waste, most of which is buried in landfill or burnt in an incinerator. Conserving and re-using this furniture, on the other hand, would save valuable resources, create employment benefits and provide affordable items to local communities. So where are we going wrong?

Taking our unique design-focused approach to the circular economy, The RSA Great Recovery partnered with recycling and waste company SUEZ. Over the course of ten days we challenged a team of pioneering designers to investigate the materials streams and systems that lead our sofas prematurely to the skip, and then to come up with some new scenarios for closing the loop on furniture waste. The question we asked was:

'How can we design better systems that will increase rates of re-use and reduce the quantity of bulky items reaching landfill and incineration?'

The Great Recovery's emphasis has always been on the practical, experiential nature of the redesign process, and this design residency allowed us to facilitate meetings between designers, waste managers, local authorities, re-use experts and other stakeholders. Using Surrey as our sample county, we spent time at Leatherhead waste transfer station and community recycling centre. We visited different partners of the Surrey Reuse Network and also gathered insights from a retailer, IKEA.

Back at our base in Fab Lab London, the team conducted a 'teardown' exercise on a two year-old sofa that we had rescued from the landfill skip. We wanted to discover the stories behind some of its materials and to think about alternative scenarios for such items. Bought from a well-known high street brand and then discarded because it no longer fitted with the owners' new interior décor, this sofa had been brought to the local tip. Despite being in good condition and highly reusable, its fire label had been cut off, rendering it unsellable by the re-use organisations.

The problem of missing fire labels was just one of many discussed by the design team during the residency. With the support of experts from Urban Upholstery, The Furniture Re-Use Network and others, we uncovered and explored the many interconnecting and systemic issues that lead our living room fixtures to the waste heap. Our insights and observations prompted us to come up with a series of suggestions as to how these could be mitigated (see our recommendations opposite), and finally to propose seven practical scenarios for redesigning our furniture systems and closing the loop on bulky waste.

These early-stage scenarios and recommendations will evolve through research and live testing as part of the shift to a circular economy.

Future Scenarios for Furniture:

1. Fire safety labels: a permanent but unobtrusive attachment
2. Alternative futures and deconstruction manual: a guide to useful disposal
3. Design for contract, rent and remanufacture: quality design for effective remanufacturing
4. 'Own Art' design services: finance models to make quality affordable
5. Entrepreneurial logistics: channeling social media to create formalised re-use zones
6. Ingredients tags and provenance tracking: QR codes and innovative labelling to track materials
7. Recertification pack: a branding device to test and re-certify items

For designers and manufacturers

- Stitch fire labels into products where they can't hang out, or stamp them on to the furniture so they can't be cut off.
- Start to progress business models that allow for and encourage products or materials to be returned.
- Encourage longevity by providing longer warranties for products. Introduce finance models that enable longer term investments in product.
- Manufacturers and designers should interact with waste managers to gain insights into second and third life opportunites. Customers should be engaged and taught to see value in their furniture.
- Encourage a culture of innovation and experimentation around the circular economy.

For waste managers

- Partnerships with re-use organisations that can collect directly from homes have high success rates. Invest in building collaborative relationships with wider networks, especially logistics, re-use and repair partners.
- Consider incentives for site staff to sort and recover materials, and to prioritise re-use over recycling through bonus schemes.
- Ensure the physical design, traffic flow and communication on site as well as the allocation of staff tasks reflect re-use as a priority (over recycling).
- Local authorities should aim to become 'resource returners' rather than waste managers, should work closer with FRNs that can do insured pick ups or look to train and insure their own drivers.

For policymakers

- Show strong leadership in promoting circular economy principles throughout all government departments, in particular Treasury, BIS and Defra.
- Introduce and enforce a principle of producer responsibility for bulky waste, in which original equipment manufacturers (OEMs) either receive their goods back at end-of-life or contribute to the costs of repair or recycling.
- Continue to increase landfill tax incrementally and introduce a future ban on landfill for bulky waste items. Use collected tax to fund re-use collection and waste prevention services.
- Encourage re-use and repair by removing VAT from repaired and resold goods.
- Ultimately, ensure that the social and environmental costs of production are not externalised as a cost to society but carried within the price of the product.

For local authorities

- Implement re-use over recycling as a priority, writing re-use shops into contracts with waste managers and prioritising re-use partnerships with retailers and waste sites.
- Recognise and communicate the social and financial value of re-use by ensuring collaboration between waste managers, social workers and budget holders.
- Encourage a culture of circular economy innovation internally, particularly amongst staff dealing with waste, procurement and re-use organisations.
- Make use of infrastructure, local knowledge and public service remits to connect local people and platforms dealing with re-use and repair services (e.g. Streetbank).
- Build business case incentives. Broker investment by manufacturers and waste managers in new sort, store and repair hubs such such as that run by Surrey Reuse Network in Addlestone.

1 Introduction

Sophie Thomas
Director of Circular Economy, RSA

The concept that design can be a universal tool for social or organisational change is gaining traction amongst business leaders and policymakers[1] and, according to the Service Design Research Network, provides a more 'human-centred' approach to innovation essential for tackling contemporary challenges.[2] Whilst this approach has revolutionised the way we currently create and design, when we look through the lens of a new circular economy it quickly becomes apparent that a wider perspective is required; one that goes before and beyond the user. This emphasis on user experience can only give you a partial picture; one that shows a product in its use stage but does not lay out the impacts of design choices before and after, often missing out the strained resources, rising waste piles and exploited workforces that come with the planet's growing consumer habits.

Over the two phases of The Great Recovery programme we have developed methodologies that allow networked teams to break down the issues surrounding a product or system, taking a much broader view than the use-life of a product and extending it into potential recovery of materials whilst thinking about retaining value in a second or third use-life. The process considers user-life expectancy, functionality, future markets, re-use opportunites and value from the material, recovery and repair perspectives. This networked approach to re-thinking at system level is crucial if we want to shift our economy to something more restorative and circular.

Research has shown that over 80 percent of the environmental impact of products we use every day is built in at the concept design stage, and that very little account is currently taken of the end-of-life implications of these designs. Moreover, if the system has not been designed to take account of the actual products, materials and behaviours that flow through it, there is very little point in merely changing the design of a single product. A keyboard designed for disassembly will still end up being shredded and put into the e-waste furnace unless a logistical system has been designed to divert it out of the existing infrastructure.

This report is a summary of the design residency supported by Innovate UK and run in collaboration with SUEZ and partners. It demonstrates the insight led, action-focused methodology of The Great Recovery on the challenging waste stream known as 'bulky waste'.

David Palmer-Jones
CEO, SUEZ Recycling and Recovery UK

The circular economy has been the guiding principle behind SUEZ's strategic decision-making since 2008. Extracting value from waste has shaped the transformation of our service offers to the public and private sectors, and of our technological assets as we move away from landfilling into processes that enable us to recycle materials and to recover energy. We also identify opportunities for collaboration with civil society organisations in order to deliver community benefits – social value – as part of our contractual obligations.

While the UK has improved its recycling performance dramatically in the past 15 years, this improvement has come at the expense of the potential for increased resource efficiency through re-use, and perhaps even more importantly, of the potential for redesign. We throw out 80-90 percent of our purchases after only 6 months of use, most of which end up in landfills and other forms of disposal.

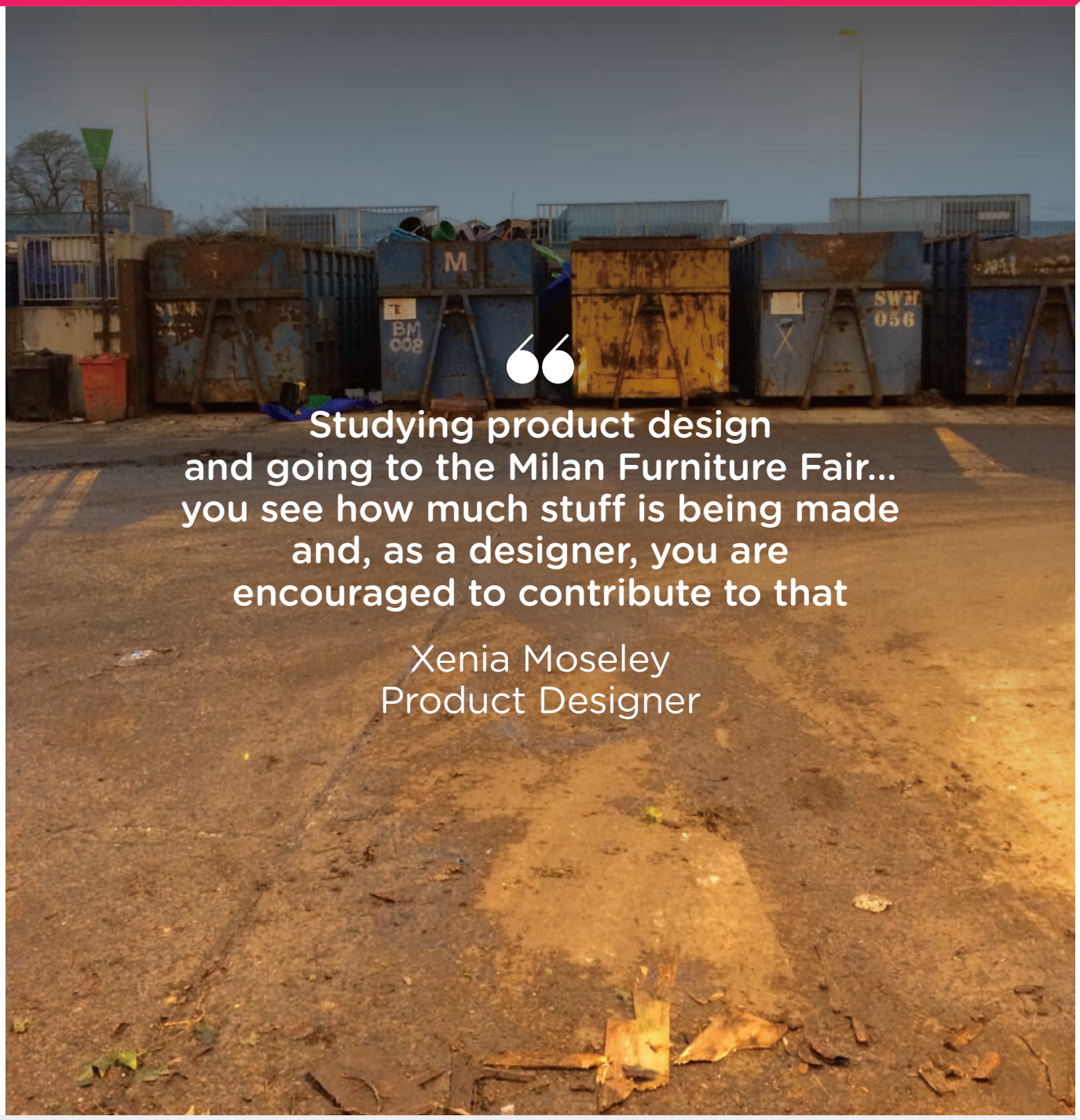
If one waste stream epitomises this fact, it is bulky waste, comprised principally of furniture. In the UK we receive approximately 800,000 tonnes of furniture at our community recycling centres (CRCs) but recover and reuse barely 15 percent. Bulky waste provides a great opportunity for investigating practical re-use potential, as well as the potential for product and service redesign for circularity. More re-use of discarded furniture also releases significant social value by engaging with community repair and distribution networks.

The RSA's flagship programme The Great Recovery provided the perfect opportunity to explore the potential for capturing and reusing more of the furniture we discard. Under the RSA's Design Residency we were able to facilitate a unique confluence of the product designer, CRC site operator and social enterprise. The aim of the project being to identify practical ways towards unlocking significant economic, social and environmental value from the site's systems and materials, and to engage retailers and third sector partners in the process. SUEZ thank the RSA for undertaking this project. We are particularly grateful to Surrey County Council for their endorsement of the project, for giving the RSA and ourselves permission to base the Design Residency at their CRC, and for the unstinting giving of their time and expertise during the course of the study. We are also grateful to Surrey Reuse Network for sharing their knowledge and expertise in furniture repair and resale with the project team.

We believe this report and the accompanying film[3] provides product designers, as well as England's policy- makers and local authorities, with valuable insights into the design and operational barriers preventing greater re-use of furniture, and how they can be overcome. The conversation starts here.

- *SUEZ handles around 8.7m tonnes of waste in the UK each year, of which about 5.4 m tonnes are recycled or recovered.*
- *They manage 16 municipal contracts, 45 treatment contracts and 11 public private partnership contracts, including that with Surrey County Council.*
- *They handle bulky waste in their 129 household waste recycling centres spread across the UK.*
- *They employ over 5,000 people in the UK delivering recycling and waste recovery services.*
- *SUEZ in the UK was known as SITA UK prior to the unification of brands across the global SUEZ Group in March 2015.*

2 The Challenge of Bulky Waste

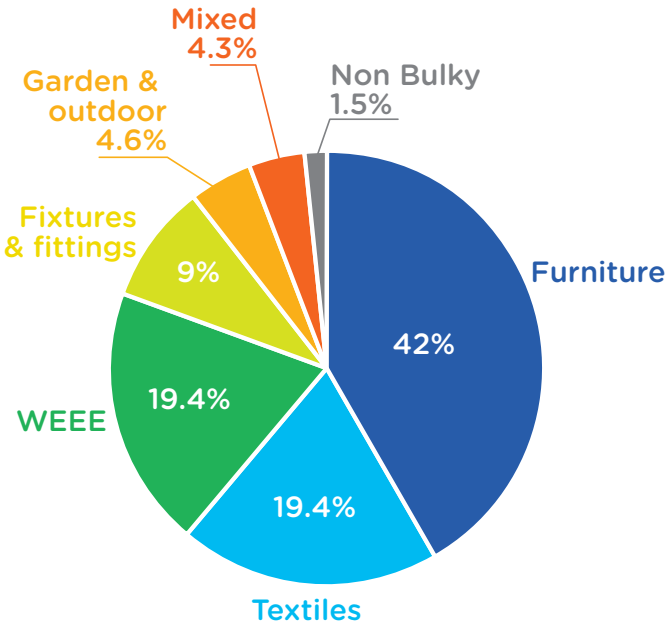


> Studying product design and going to the Milan Furniture Fair... you see how much stuff is being made and, as a designer, you are encouraged to contribute to that

Xenia Moseley
Product Designer

Every year in the UK we throw out around 1,600,000 tonnes of what is defined as bulky waste.[4] This includes large items that do not fit into a standard dustbin or, according to some local authorities, 'items you take with you when you move house'.[5] Approximately 42 percent of this waste is furniture, with the rest mostly comprised of textile (19 percent, including mattresses) and electrical or electronic waste (19 percent).

Due to its size and perceived low value (as reflected in its name), bulky waste is awkward to manoeuvre, expensive to break down and transport, and more often than not it ends its life in landfill. However, around 32 percent (by weight) of bulky items are in fact re-usable in their current state, and this figure rises to 51 percent if we take into account items requiring slight repair.[6] WRAP's work on the re-use benefits of bulky waste show that re-using (as opposed to recycling or incinerating) 1 tonne of sofas would save almost 1.5 tonnes of CO_2 emissions and would also create net employment benefits.[7] But current rates of sofa re-use hover at around the 17 percent mark.[8]



Bulky waste average composition by theme. WRAP[9]

A Circular Economy

The model of a circular economy presents an alternative to this linear system of accelerating waste production. It aims to conserve natural resources by substituting products with services and designing things to be used again and again before the materials are recovered.

Finally, materials are recovered and recycled back into new resources, reflecting the cycling of elements in natural systems, in which the waste from one process is the food for another.

The circular economy has been hailed by businesses, moreover, as a way to marry environmental sustainability with profitability. McKinsey and the Ellen MacArthur Foundation have suggested that a circular economy represents an economic opportunity of more than $1 trillion globally, whilst the UK's Waste and Resources Action Programme (WRAP) points to a minimum of £23bn per year that could accrue to UK businesses were they to shift to more circular systems.

This design residency represents a joint investigation into the possibilities for circular economy innovation. It brings a design-based approach to the challenge, beginning the investigations at the end-of-life stage where insight and knowledge of a system or product failure is often held. This challenge is articulated as:

How can we design better systems that will increase rates of re-use and reduce the quantity of bulky items reaching landfill and incineration?

3 Design Thinking & Methodology

Since its inception in 2012, The Great Recovery project has used design thinking and methodologies to investigate the challenges and opportunities for a circular economy. The focus is on insight gathered at the end-of-life stages of a product's existence, that can be fed into R&D in new materials and design, and highlight practical barriers to circularity that can help shape new business models. We convene communities of individuals and organisations from divergent industries to explore and uncover the problematic materials and manufacturing processes used in our electronics, textiles, packaging and other everyday items.

Visits to waste sites, recycling plants and re-manufacturing facilities, and the introduction of product 'teardown' (literally taking something apart to reveal its materials, components and design) brings the designers, manufacturers, material scientists, business managers and others face-to-face with the consequences of their output and helps them gain understanding. From this they can begin to redesign products and services for more circular systems.

The Great Recovery's pilot innovation hub at Fab Lab London is also providing a unique space for action-centred research, in which all parts of the supply chain and circular network can share knowledge, rethink materials streams, rewrite business models and prototype circular design in a hands-on, practical and collaborative way.

In order to glean more understanding of specific circular challenges, and to allow designers to spend longer 'deep diving' into products and systems, The Great Recovery has developed an 'insight design residency'. These residencies allow extended access to experts, particularly at the end-of-life stages, and see brokered teams from the network focus on specific issues or products, gathering expertise that allows for new designs of systems and opportunites to be developed.

Our approach to bulky waste

Faced with the loss of material, social and economic value inherently invested in a pile of waste furniture, this design residency set out to explore the challenges at both product and systems levels, and to further develop concepts and prototypes that could help shift behaviour and business practice towards reducing wasteful practice in this sector.

Designers from all backgrounds and disciplines responded to an open invitation for a place on the residency which ran for 10 days over two months. Four designers were chosen:

Ella Doran – an award winning designer who runs her own business focused on interiors and textiles.

Kirsty Ewing – a design researcher with expertise in sustainability, product-service systems and business models.

Sarah Johnson – a redesigner, founder director of two businesses and educator of 'designers who don't want to make landfill'.

Xenia Moseley – a social entrepreneur, maker and craftswoman, and one of The Independent's five freshest design talents in 2014.

The Great Recovery's Four Design Models serve as guides to redesigning products and services for a more circular economy. The nature of the products suggest that new design approaches for bulky waste should focus on the models closer to the user, developing longevity through repair and re-use and service.

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 re-use 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 product streams such as packaging must work effectively with the recovery industry to increase the value of material recovered and to reduce contamination and multi-material complexity.

Case study: Surrey Reuse Network

Surrey Reuse Network (SRN) comprises seven local furniture re-use organisations (FROs), including Kingston Community Furniture (KCF). The FROs collect items from sites like the SUEZ waste transfer station and community recycling centre in Leatherhead and take them back to their own shops to be sorted and resold in the community. The network diverts around 600 tonnes of furniture away from landfill and recycling every year, saving the county council money on recycling costs and landfill taxes. It offers volunteering and work-based training to around 400 people a year, and supports around 5,000 low-income households with affordable household goods through the Local Assistance Scheme (LAS). By pooling members' resources, the SRN has started to take on contracts for bulky waste home collections from some of the district councils.

Addlestone Hub is a new venture set up by Surrey County Council and the SRN for the centralised

the community. It is currently in the process of gaining Authorised and Approved Treatment Facility (AATF) accreditation for large waste electricaland electronic equipment (WEEE) products such as washing machines, provides Portable Appliance Testing (PAT) testing for smaller electrical items, and has also started to operate upcycling and repair services for furniture. According to Adrian Collins of KCF, there is both enormous availability and huge demand from the Local Assistance Scheme and others for these cheaper reused goods, but without places like Addlestone to check and refurbish the items they can end in recycling (downcycling) skips and landfills.

4

The Journey of Bulky Waste

Over the course of the residency the team visited several places that represented stopping-off points in the bulky waste stream to observe and gain insight on the challenges and opportunites. They spoke to experts from the Furniture Re-use Network, RICS SKA Rating system for interiors, Warwickshire County Council and others along the way.

Day 01

The Waste Collector: Leatherhead Community Recycling Centre (CRC)

Starting at the SUEZ waste transfer station and Community Recycling Centre (CRC) in Surrey, the team saw a repository for a huge variety of residents' unwanted products. The facility has a re-use collection area to redirect bulky items to the re-use charities, as well as trained staff who actively go through rubbish bags to pick out recyclable materials in the 'bagged household waste' skip.

Day 03

The Manufacturer and Retailer: IKEA

IKEA's Sustainability Manager, Charlie Browne, discussed the company's partnership with the Furniture Re-use Network in bringing **reverse logistics** into their retail business. The team discussed longevity in furniture and how other models like mono-material approaches could apply for lower price range pieces.

Day 02

The Reuser: Kingston Community Furniture (KCF)

Some of the reusable items from Leatherhead CRC are brought here to be checked, have minor repairs done and be sold back into the community. Adrian Collins (KCF) explained the work of Surrey Reuse Network and how long-term unemployed residents are helped back into the workforce by being taken on and taught new skills.

The Repairer: Addlestone Hub

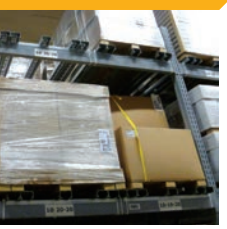
Addlestone receives waste furniture as well as white goods from Surrey CRCs. Articles are sorted and tested before being passed to Surrey Reuse Network shops for resale. Supported by Surrey County Council, it is an important storage location, and some items are upcycled by staff who are also given training and helped to find jobs.

The Sofa that Survived the Landfill Skip

Whilst we were observing at the Leatherhead site, we witnessed the unloading of a sofa from the back of a resident's car. After a few enquiries, it was ascertained that the sofa was a high quality product from a reputable furniture brand. It was about two years old and would have been bought new at a price of around £2,000. It was still in very good condition and had the potential to fetch a good price if re-sold. However, a thorough check by a Leatherhead staff member revealed no fire label, and so the sofa ended up, as many do, in the landfill skip.

Re-use organisations will not re-sell sofas and armchairs without fire labels, and according to

Adrian Collins from KCF around 50 percent of reusable sofas end up in landfill purely because they do not have these labels. Our design team rescued the sofa from the skip in order to perform a product tear-down and investigate its components more closely. See page 14 to read about the next stage.



Day 04

Insight gathering
Discussions with Craig Anderson, CEO of the Furniture Re-use Network, Elina Grigoriou, Design Director and RICS SKA Rating technical committee chair and David Whitehouse, Project Manager, Waste Management, Warwickshire County Council.

Day 06

The Recycler and Textile Tester: Camira Fabrics
A visit to Camira's textile factory in Huddersfield led to the development of a new upholstery fabric made of waste offcuts retrieved from their suppliers.

This fabric was used to re-upholster the sofa that survived the skip.

Day 05

The Street Salvager and Sofa Transformer: Urban Upholstery
Back at Fab Lab, sofa hackers and Hackney furniture experts Urban Upholstery helped to deconstruct this sofa that was pulled from the landfill skip at Leatherhead CRC. Later in the project the survivor sofa was given a new lease of life.

Day 7-10

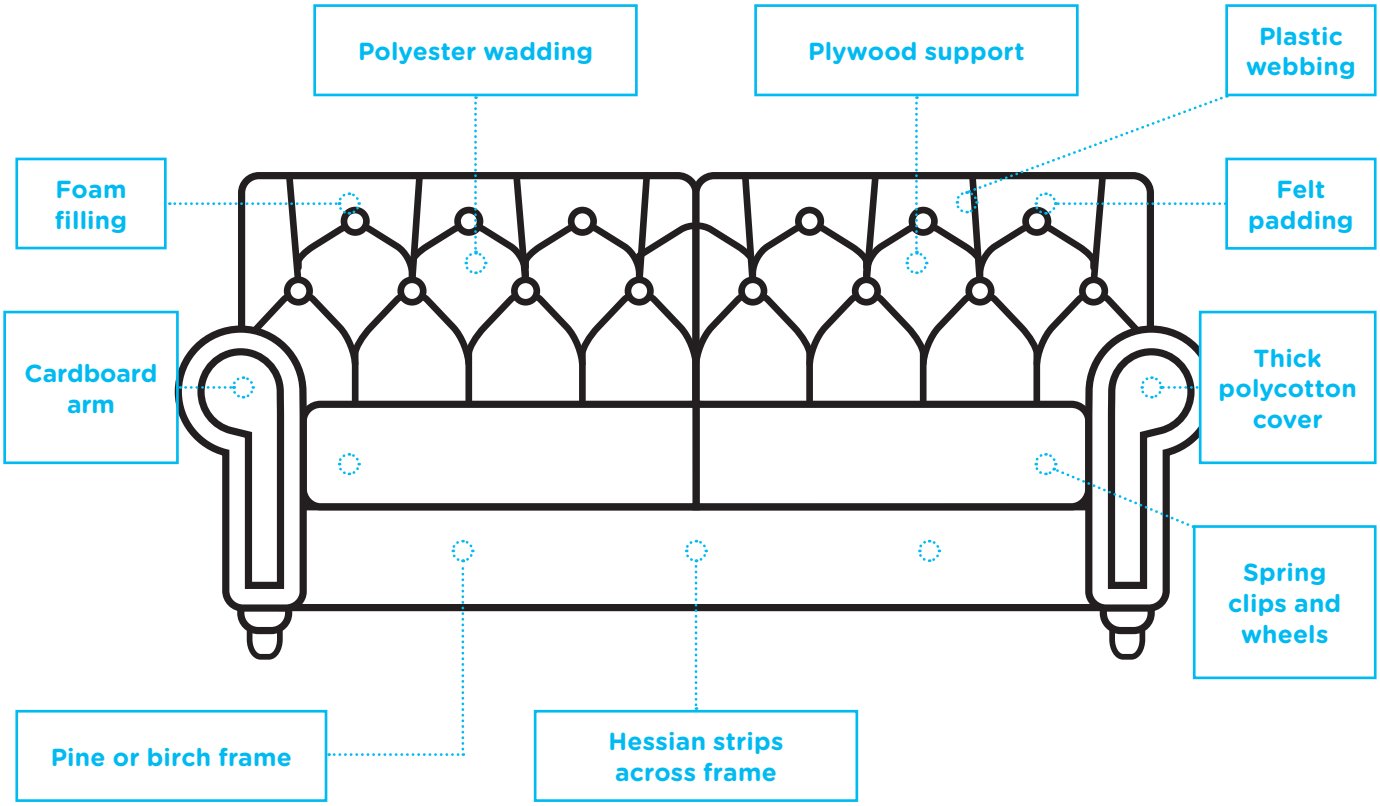
Feedback to the network
Further research culminated in a roundtable discussion at the Fab Lab with our partners and other stakeholders.

The Sofa Teardown

Back at the Innovation Hub in Fab Lab London, carrying out a practical teardown process on two sofas - each sold in different price ranges - allowed the design team to further investigate each of the sofa's materials, process of manufacture and opportunities for redesign.

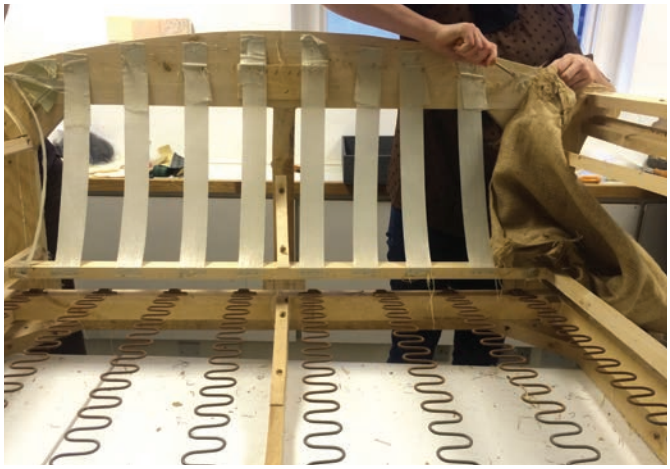
We wanted to know what kinds of materials they contained and how easy it was to deconstruct them, in order to gauge recoverability. Well-made sofa frames such as the one we uncovered in the more expensive model can be worth more in the right market than the sofas themselves.

What makes a £2,000 sofa?



Even with expert upholsterers and specialist tools it took over two hours to disassemble the recovered sofa. This makes it an unlikely candidate for material recovery (disassembly and material recycling) in a business context, as the labour costs would be much higher than any value recouped from the materials. However, these were quality materials which could have lasted for much longer than its actual two-year life.

Had it not been for the issue of the fire label, the obvious next step would have been direct re-use (with potential for repair after several years), making it a candidate for the 'design for longevity' model.

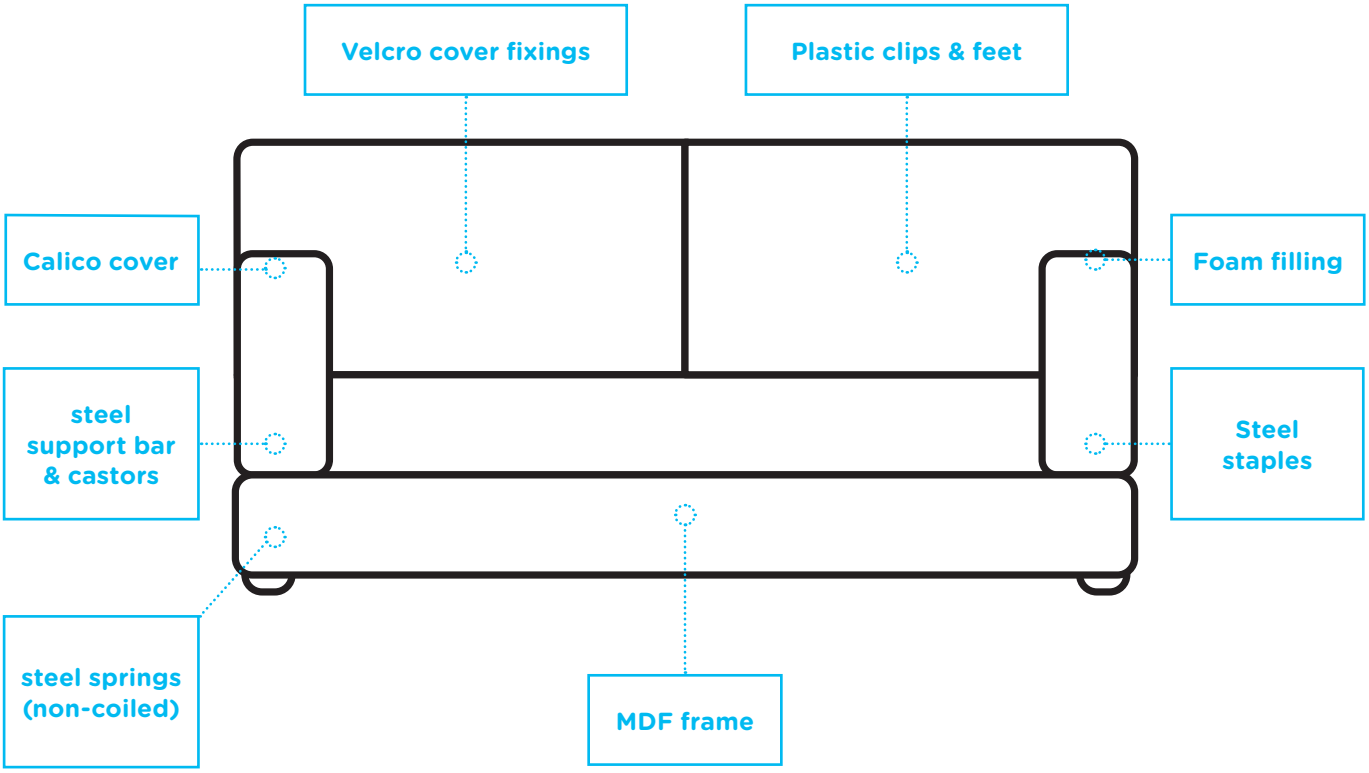


Case Study: Urban Upholstery

Patrizia and Andrea from Urban Upholstery have created a business out of giving new life to furniture they find fly-tipped on the street. Stripped down to their frames and depending on state and quality, the sofas and armchairs recovered from the street can be worth up to £600 – or more in the case of a Chesterfield. Recognising that it is usually the seat and arms of a sofa that wear out first and lead to it being thrown away, in 2012 the pair set about developing a sofa that had modular parts: replaceable arms and a 'mattress' seat. They called it the BauBau sofa, and it

comprised of a frame rebuilt with hand tied springs, press fasteners, elastic webbing and layered natural materials – all of which enable it to be renewed and given many new lives, and doubling the value.

What makes a £200 sofa?



The second sofa was a new model with an unrepairable defect. It did have its fire label, so could have been re-sold. It took less than an hour to take apart and had fewer material components. However, It had clearly been designed for efficient assembly - which is true for a large number of sofas that are put together at speed - using staples; easy to fire in, but almost impossible to get all of them out. Research confirmed that the cost of re-upholstering it would be more than the price of buying a new one. It would be a candidate for 'design for remanufacturing' (re-use of suitable components) and there were signs of re-use in the frame at the pre-retail stage, or 'design for material recovery' (recycling of original materials) models if an alternative could be found for staple assembly.

5

Insights & Challenges

Our observations and follow-up explorations culminated in a series of insights that can be used to inform future product and service design

Collection systems often lead to broken items

At community recycling centres like Leatherhead CRC, the focus is on recycling. The system and material streams collected reflect current legislative targets that aim to push up the volume of material recycled in Europe and the UK, but which do little to recognise the potential value in product re-use. Staff do their best to rescue re-usable items, but generally resources are limited, and when things get busy, as they often do, roles revert to managing the traffic flow on site. The centres themselves work on a drop off basis where the public can come to deposit large items of waste, putting them in containers which take different materials or products. For example some containers will be for metal and some for mattresses. The separation of materials will depend on who is contracted to collect the waste and what has market value at the time. The containers are designed for large scale collection and recycling so when you put something in, it's unlikely to survive the fall or will be crushed under the weight of other objects.

As with other waste streams, bulky waste suffers from breakage at many points of collection. The transport vans sent out to collect bulky waste from people's homes by council contractors have high caged sides, and little care is taken when items are thrown in.

Recommendation: Partnerships with re-use organisations that can collect directly from homes have high success rates. Invest in building collaborative relationships with wider networks, especially logistics, re-use and repair partners.

Spatial design influences behaviour

Recycling centres serve a vital role. Often referred to as 'the dump' - a harkback to a 'landfill only' past - most have high material turnover, big recycling targets and serve a continual stream of drop-offs from the local community. All this means easy access and flow around the site is essential. It also puts an uneven emphasis on the recycling skips rather than the re-use area which is often near the exit (thus helping to hit volume targets as opposed to keeping value). Centres have a duty of care to make sure that any item dropped off ends up being processed responsibly and not taken by those that use or work at the site to be resold for personal gain. However, many items still work or are reusable and we often saw people carefully placing an item next to the skips, not in them, in the hope that someone would want it and it wouldn't end up smashed to pieces. Re-use spaces are generally too small or not obvious, sometimes positioned after the labelled skips and must be attended to keep items in order and prevent issues with theft.

Recommendation: Ensure the physical design, traffic flow and communication on site as well as the allocation of staff tasks reflect re-use as a priority (over recycling).

Financial incentives support good practice

At the Leatherhead CRC, site staff are encouraged to pick reusable and recyclable items out of waste streams and receive a quarterly bonus for meeting these diversion targets. However, this practice is an exception in the industry. Staff at other CRC sites across the UK are not incentivised in this way, and a change of management at one site visited by our designers led to a similar bonus system being scrapped. This dramatically affected the site's recycling rate, which fell from 90 percent to 60 percent almost overnight.

Recommendation: Consider incentives for site staff to sort and recover materials, and to prioritise re-use over recycling through bonus schemes.

The business case for re-use is hard to build

Although the waste hierarchy has been promoting re-use over recycling for several years, there are few incentives for companies to make a viable business out of it. Re-use remains largely a charity dominated industry and, in the case of furniture, often requires voluntary or local authority support - the SRN was started with help from Surrey County Council.
The business case for recycled raw materials has been proven and businesses are able to profit by finding markets for various levels of quality and purity. The financial incentive for waste management companies to encourage re-use is often negligible, as the social benefits are long term, and often difficult to measure.

Recommendation: Build business case incentives. Broker investment by manufacturers and waste managers in new sort, store and repair hubs such as Addlestone.

Throwing stuff away is not a free option

Despite the high costs of waste disposal to local authorities the reality is that anyone can dump products full of valuable resource with no consequences or penalties. As a society we still believe waste collection (and recycling services) are free. These costs are there, but hidden in our council tax bills, or completely externalised in production processes. The stresses on local authorities to collect, store and process waste streams when budgets are continuously reducing is becoming visible. Education centres are closed, repair shop ideas are shelved and responsibility is pushed to the waste contractor, shifting the emphasis back onto maximising material volume. The potential value held in these waste flows will not be realised by the local authorities who only get paid for full skips therefore disincentivising the collection for re-use. We heard about staff in a CRC seeing large quantities of high value copper going into a metals collection skip. They separated it out from the other metals, thereby adding value to the load for the contract reprocessor. In spite of this, the reprocessor only paid the HWRC a basic price for metals, based on volume rather than value.

Recommendation: Ensure that the social and environmental costs of production and disposal are not externalised as a cost to society but carried within the product price.

Bulky waste is expensive waste

Despite landfill tax having pushed up the cost of putting rubbish in the ground in the last 10 years it remains arguably the cheapest and most straightforward option for bulky waste. These items have high transportation and material recovery costs and often cannot fit into the energy-from-waste incinerators. Moreover, whilst producer responsibility legislation exists to a more or less efficient degree in sectors such as electronics and packaging, there is no equivalent for furniture, and therefore no legal incentive for manufacturers to consider end of life scenarios in their designs.

Recommendation: Introduce and enforce a principle of producer responsibility for bulky waste, in which original equipment manufacturers (OEMs) either receive their goods back at end-of-life or contribute to the costs of repair or recycling.

Communications 'black spots' interrupt the flow of materials

In order for materials to flow in the most 'circular' way, they need to be accompanied by information detailing effective use, disposal and recovery. Currently there is no requirement to include this information when you sell a piece of furniture. One sofa guide we read did mention material durability and modular design facilitating disassembly of the product at the end of its life, though gave no suggestions for what to do with the pieces being replaced. There are issues around up to date collection information but technological solutions are available.

'Sadly, many people don't follow the instructions', said Charlie at IKEA. 'This leads to further damage and wastage both at the assembly and disassembly stage'. This was backed up by observations at many of the CRCs visited and was illustrated by one couple, who said that they were disposing of their self assembly cupboard because it had broken when they took it apart to move house. Although flat-packed furniture is designed for self-assembly, it is not currently designed for self disassembly and re-assembly or re-use.

Recommendation: Manufacturers and designers should interact with waste managers to gain insights into second and third life opportunites. Customers should be engaged and taught to see value in their furniture.

No fire label? Straight to landfill

Most people do not understand the reasons for keeping fire labels intact and attached. These labels can be unsightly or get in the way, and therefore frequently get cut off without a thought for later importance. Even though a sofa without a label can be sold on by an individual, re-use organisations are unable to without the regulation fire label, and the furniture is then far more likely to end up in landfill. In a discussion at Kingston Community Furniture, project manager Adrian Collins estimated that around half the number of sofas disposed of ultimately end up in landfill because they have no fire label attached.

Recommendation: Stitch fire labels into products where they can't hang out, or stamp them on to the furniture so they can't be cut off.

As soon as we consider something to be waste, it will become waste

One man's waste is another's gold, and as we saw time and again it is people's perceptions about what is, or isn't waste that effectively determines the fate of an object. The couple that brought the high quality sofa to the CRC had not considered reselling it on sites such as eBay, Gumtree or Freecycle (it is perfectly legal for individuals to sell second-hand furniture without a fire label), or if they did, dismissed it as too time consuming. Items that are no longer wanted by one person will still hold value for others so re-selling should be made as easy as possible.

Recommendation: Make use of infrastructure, local knowledge and public service remits to connect local people and platforms dealing with re-use and repair services (e.g. Streetbank).

We are only as strong as our networks

As we visited the various facilities, we saw how crucial the 'in-betweeners' were to the rest of the network. Van drivers in particular play a key role in ensuring that furniture is transported safely from a resident's home to a re-use charity, without breakages or 'swap-outs'. (Unfortunately, quality second hand items are sometimes mysteriously replaced with unusable second hand items whilst enroute to the re-use centre, lowering the rates of resale and revenue for the charities). According to Adrian from KCF, a real change in the drivers' behaviour can come about through understanding who the furniture is for – in some instances people from their own communities who have a pressing need for these inexpensive items.

Similarly we learnt that, at IKEA, engaging staff on different sustainability issues by getting them to test products at home and report back has been very successful for the brand. Staff now have more ownership over what makes it onto the shelves and feel informed enough to discuss pros and cons with customers. Inter-store competitions and a regularly updated 'leaderboard' on energy and waste statistics have encouraged new behaviours around efficiency and social good, whilst bagging and labelling mattresses which are sent on to re-use organisations, and asking the transporters to look after them in transit, has likewise improved re-use through communication.

Recommendation: Recognise and communicate the social and financial value of re-use by ensuring collaboration between waste managers, social workers and budget holders.

Risk-averse cultures inhibit re-use

Currently, Surrey district and borough councils do not insure their bulky waste collection drivers to enter residents' homes, so residents are instructed to leave the furniture outside to await collection.[10] The booking system can mean there is a few days' wait during which time the furniture is exposed outside and can be damaged by rain or vandalised. Soggy sofas and broken tables are very unlikely to be resold, thus increasing the stream of bulky items entering landfill. Conversely, the Surrey Reuse Network does insure its drivers to enter homes, meaning that items are protected from the elements until the day of collection and are therefore far more likely to have a second life. Interactions with residents can also provide vital 'touch points', increasing re-use in the future and and trust in the system.

Recommendation: Local authorities should aim to become 'resource returners' rather than waste managers, should work closer with FRNs that can do insured pick ups or look to train and insure their own drivers.

Size matters

One of the reasons most high street charity shops focus on fashion rather than furniture is that furniture is bulky and heavy, difficult to transport on foot or in the family car. For local authorities, and charities and businesses looking to increase re-use, the cost of transportation is a very real issue, and can mean that it is still cheaper to take the furniture to landfill than to a re-use or even recycling facility. Residents without a car have to pay to have their bulky items collected, but costs can reach £30-60 per item, and in poorer areas particularly this can lead to fly tipping. We learnt that people will sometimes chop up furniture in order to fit it in to their car and take it to the recycling site,[11] meaning that any re-use value is instantly lost.

Recommendation: Continue to increase landfill tax incrementally and introduce a future ban on landfill for bulky waste items. Use collected tax to fund re-use collection and waste prevention services.

We can't compete with China on labour costs

One of the most fundamental barriers to an increase in circular economy activity is the cost of labour in the UK. Transportation, processing, cleaning and repairing are labour-intensive activities, for which the associated costs often outweigh the value of the products or materials recovered, particularly if the original manufacture took place in the Far East. However, companies like IKEA now estimate around 80 percent of the cost of its products goes on raw materials, compared to 20 percent less than 10 years ago.[12] As material prices rise, therefore, it may become more viable to invest greater amounts of labour in recovering and re-using these materials and products.

Recommendation: Encourage re-use and repair by removing VAT from repaired and resold goods.

Long-term thinking is currently unconventional

The ideal scenario for bulkier products in a circular economy is that these items are designed for longevity. Indeed, investing in something that will last a long time is often less expensive on a per-use basis than buying the cheapest alternative. Most modern furniture is manufactured with foam that crumbles after 10 years through oxidisation, according to Urban Upholstery, whereas traditional stuffing techniques that use natural materials like wool and coir last for at least 20-50 years. In the past Italian tradesmen would go around the villages re-carding and re-filling the wool in mattresses and furniture, giving it incredible longevity. Today, however, with products available at much cheaper prices, enabling and persuading people of the value of investing for the long term is a challenge for retailers and marketeers, especially when profits are predicated on through units sold rather than customers held.

IKEA is attempting to communicate the value of longer-term investments to customers in the case of its solar panels, which have so far exceeded their sales targets.[13] The concept of 'pay now, benefit later' - the solar exemplify with the idea of pay-back times - directly contrasts with the 'benefit (consume) now, pay later' model that some furniture companies promote through their finance offers, and which can lead to customers paying for the furniture up until or even after the end of its life. The question is how to translate this long-term approach into the furniture market, in order to achieve both an increase in quality and a reduction in waste.

Recommendation: Encourage longevity by providing longer warranties for products. Introduce finance models that enable longer term investments in product.

Getting things into the re-use system is complex and time consuming.

Whilst at Leatherhead CRC we saw many items, including the high quality sofa, that could have been resold or donated by the owners via sites such as eBay, Preloved or Freecycle. However, brief conversations with residents and staff showed that, for many people, time is proportionately more valuable than money, and the convenience of offloading the unwanted item at the CRC was a more attractive and faster option than taking pictures of the piece, uploading them onto a website, and then waiting for someone to show interest and collect it.

Despite its partnerships with furniture re-use organisations (FROs), re-use also remains a big challenge for stores like IKEA: 'It would be easier for us just to have a skip in the backyard with a shredding and recycling plant', says Charlie Browne. Re-use on the other hand involves coordinating collections with brokers and allowing for localised incidents which can sometimes prevent the FROs from collecting items on the agreed day, leading to a backlog and a slowdown in the system. The relationships between the retailer, logistics manager and the FRO in facilitating effective material 'flows' are critical here.

Recommendation: Implement re-use over recycling as a priority, writing re-use shops into contracts with waste managers and prioritising re-use partnerships with retailers and waste sites.

Infrastructure is not yet developed

Despite their work with re-use charities to take back waste items, IKEA still finds the practice of reversing the logistics streams problematic: 'You can get things from A to B. But getting them from B to A can be a nightmare.' says Browne. One-way linear systems are part of the 'business as usual' approach, and shifting these represents a change in attitude as well as process. The lack of identified markets for the secondary materials, recycling infrastructures and associated costs of transport have been a significant factor in mattresses and other bulky items continuing end up in landfill[14].

Recommendation: Start to progress business models that allow for and encourage products or materials to be returned

Circular economy activities such as sorting, testing, cleaning, repairing and reselling moreover require space in which to happen, but with land and property costs on the rise this in itself is a challenge.

Addlestone Hub in Surrey is piloting the combined capabilities of storage, testing, repair, training, and retail in partnership with the County Council.

6

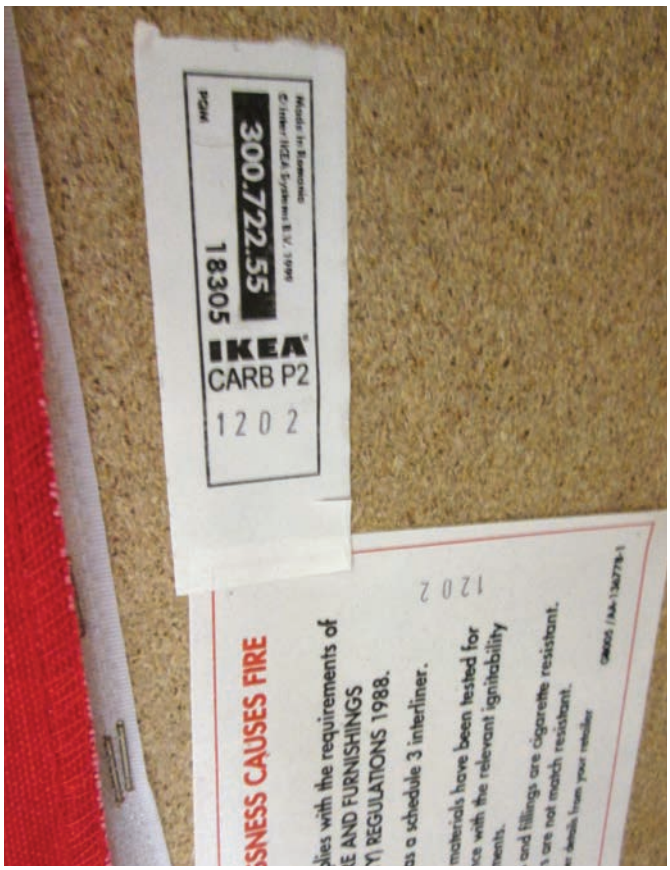
The Future of Furniture

During the final leg of the Residency, the designers came up with seven suggested scenarios for improving current systems and closing the loop on bulky waste. Each concept needs further research and development and has the potential to increase re-use in our society.

1. Fire safety labels

Most people do not understand the reasons for keeping fire labels intact and attached. These labels can be unsightly, or get in the way, and are therefore frequently cut off without a thought. Even though a sofa without a label can be sold on by an individual, re-use organisations are unable to sell them and are unwilling to take the risk of giving them away without the regulation fire label, and the furniture is then far more likely to end up in landfill. Standardising the location and fixture of fire labels and considering more permanent attachment would solve this problem. Attention and collaboration from manufacturers, policymakers and industry groups is required to make this small but significant change.

We suggest that labels are attached in such a way that they can't be easily removed; for instance, stitched all around the edges or replaced by a stamp. They should carry valuable information, such as an ingredients list and 'do not remove' message, be non-obtrusive and placed in a consistent location. They should also be linked to warranty information via a simple written message or QR code.



2. Alternative futures & deconstruction manual

People are currently not aware of what happens to their furniture at the end of its life. They often don't know the best ways to dispose of it, or understand the likelihood of it being landfilled as opposed to reused. Once households have decided to buy something new they are rarely committed to spending lots of time or effort dealing with their old furniture. Budget furniture is not built to last, and once it breaks or becomes worn, most people will replace the whole piece rather than seeking to repair it.

We propose an on and off-line guide to alternative futures for furniture. As well as listing re-use organisations, manufacturer take-back schemes and repair or resale options (eg eBay), the guide would specify methods of deconstruction for handy material separation and recovery (rather than a paid for collection or illegal dumping)! Guides would be distributed at point of sale, and would amount to practical, customer-focused instructions on how to retain embedded material value.

> **There are pros and cons with different design solutions – depending if you aim for durability or remanufacture or deconstruction**
>
> Kirsty Ewing
> Design Researcher

3. Design for contract, rent and remanufacture

For a rental or service market, people need high quality, well-designed, environmentally sound furniture that doesn't cost a lot up front and has an easy removal process at the end of its life. Manufacturers need to try to keep hold of the value inherent in the material parts of their products, ensuring that the product maintains its quality on a semi-frequent refurbishment basis (average four years). But organisations have become used to buying their furniture, not leasing it, and space for storing furniture safely in between leases as it awaits remanufacturing can be very costly.

We suggest that manufacturers make use of mono-material construction and design components for simple adaptation, disassembly, remanufacture and material recovery. The residual value of furniture should be recognised, as it is with cars, and materials should be recoverable at the end of the lease. Frames (eg of sofas) must be good quality, for effective re-upholstering or refurbishment (for instance using tacks instead of staples), and the designs should also be easy to store.

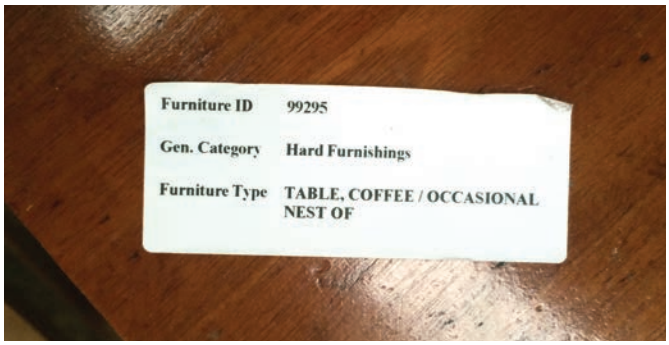
Relationships with dealers must be developed, as these will affect the success of the service.

4. 'Own Art' design services

Good design should be just as accessible and – most crucially – investable as art. But encouraging people to invest in long lasting pieces or in refurbishment services is not easy, especially when they are faced with cheaper models from companies with persuasive marketing practices and low income restrictions. Quality pieces of furniture should be affordable to all, encouraging design for longevity and design for life. We need to support and encourage designers, through investment, to make quality work that lasts and is not thrown on the waste heap after a couple of years.

Own Art is supported by funding as per the model of Arts Council England, and uses a loan model eg 'makes buying art easy and affordable by letting you spread the cost of your purchase over 10 months with an interest free loan'. By doing so this model supports individual artists and enables people to invest in bespoke work that can gain in value. We propose that this initiative is extended to include design services such as reupholstering, bespoke design and direct sales of furniture.

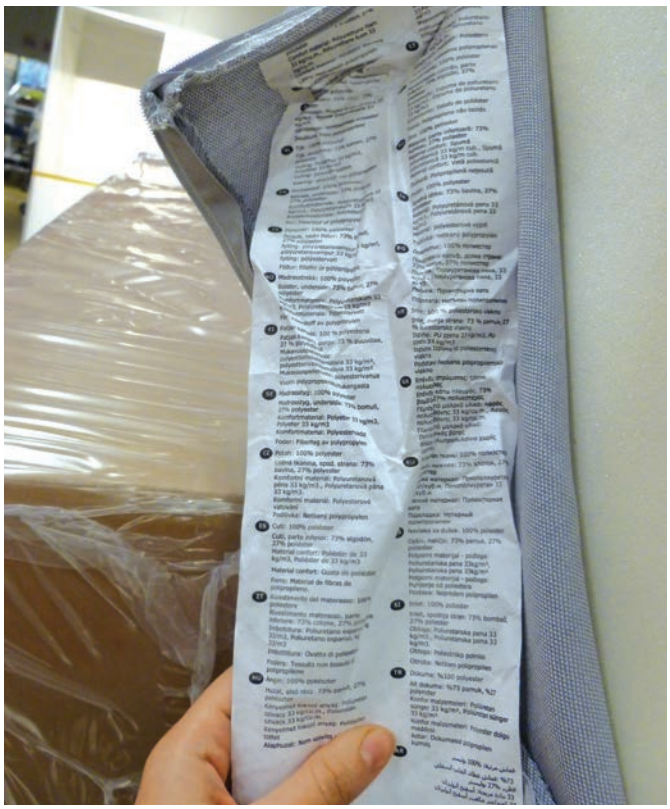
> **I'm interested in designing for lease: imagine a sofa that would be commercially viable, that would be easily refurbished and keep its residual value and would work financially, aesthetically and environmentally for everyone**
>
> Sarah Johnson
> Redesigner



5.Ingredients tags and provenance tracking

Manufacturers, retailers, consumers and waste management companies all need to be better informed about the materials and products they are handling, so that they optimise re-use or recovery. In order to track materials, components and products through a system, we need to require a complete 'bill of materials' that records all materials in any particular product. This type of open disclosure should also aim to encourage more informed consumption. But sourcing information from the numerous levels of a supply chain - who may not know, or wish to disclose the relevant information – can prove very costly and challenging, even for the largest retailers and manufacturers.

The proposal is for different furniture items to carry barcoded labels, QR codes or simple written labelling with supply chain information. Existing platforms such as Historic Futures and History Tag can be developed and leveraged and logging services tested and prototyped.



6. Entrepreneurial logistics

Bulky waste that is collected at the kerbside is often subject to weather damage and careless handling, reducing any chance of re-use or resale. A 'grey' market of furniture resale has also led to quality goods being siphoned off before they can reach the charity re-use organisation. Collection schemes are regulated by differing authorities, and consequently long waiting periods and insurance-related rules can prevent entry into homes to collect furniture. When WRAP and Argos piloted a re-usable bag for home deliveries of new sofas, results showed that it reduced returns rates, gained positive feedback from customers and operatives, had the potential to reduce packaging by 1,560 tonnes per year, and would lead to cost and environmental benefits. The key to success, however, was how effectively the variables[15] in the system could be managed by those running it.

Social media could be harnessed to create formalised re-use zones, combating fly-tipping and enabling value to be recovered. Bulky waste is dropped off at the nearest re-use zone, photographed, and a localised QR code scanned and uploaded. These would go to a web-based catalogue. Waste entrepreneurs and FRNs pay a small subscription fee to gain access and receive real-time updates, which in turn pays to clear any unwanted items. Weather-proof 'body bags' (rather like the WRAP /Argos sofa bag) would be available to protect soft goods from the elements and ensure that they go on to a second life.

> **There's so much opportunity in the household for waste not to become waste, but there's a kind of mismatch in communication and so it ends up in a site like Leatherhead and SUEZ has to deal with it**

Xenia Moseley
Product Designer

7. Recertification pack

Sofas are one of the most common forms of bulky waste in the UK. Due to fire safety standards, soft furniture is not resold or reused if its fire label has been removed, and it tends to end up in landfill or incineration instead. Electronics can be PAT tested, but a similar mechanism for re-certifying soft goods and re-establishing fire safety does not exist. Current fire safety methods 'test to destruction' and use match and cigarette tests so could not be repeated on an item that you want to keep in good quality for a re-use market.

The proposed recertification pack would 'swatch' test for fire safety and train furniture re-use organisations and waste professionals to judge suitability for re-use. A patented 'branding' device would simultaneously test for fire safety, certify and re-label the item, and also raise awareness amongst consumers about the possibility and maybe the history of a 'second life' for their unwanted and reused furniture.

> **Sitting round the table on the final day with manufacturers, recyclers, waste managers, and the design residency team meant there was some great debate. However, we just touched the tip of the iceberg. There is a real game changing opportunity to affect and redesign a pretty broken system**
>
> Ella Doran
> Interior Designer

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[10] Conversation with Adrian Collins (KCF) and Hera Cottrell (Surrey CC)

[11] Conversation with site staff members at Leatherhead CRC

[12, 13] Conversation with Charlie Browne, IKEA

[14] Conversation with Tom from RWS Reccom

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www.greatrecovery.org.uk

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