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Investigating the role of design in the circular economy

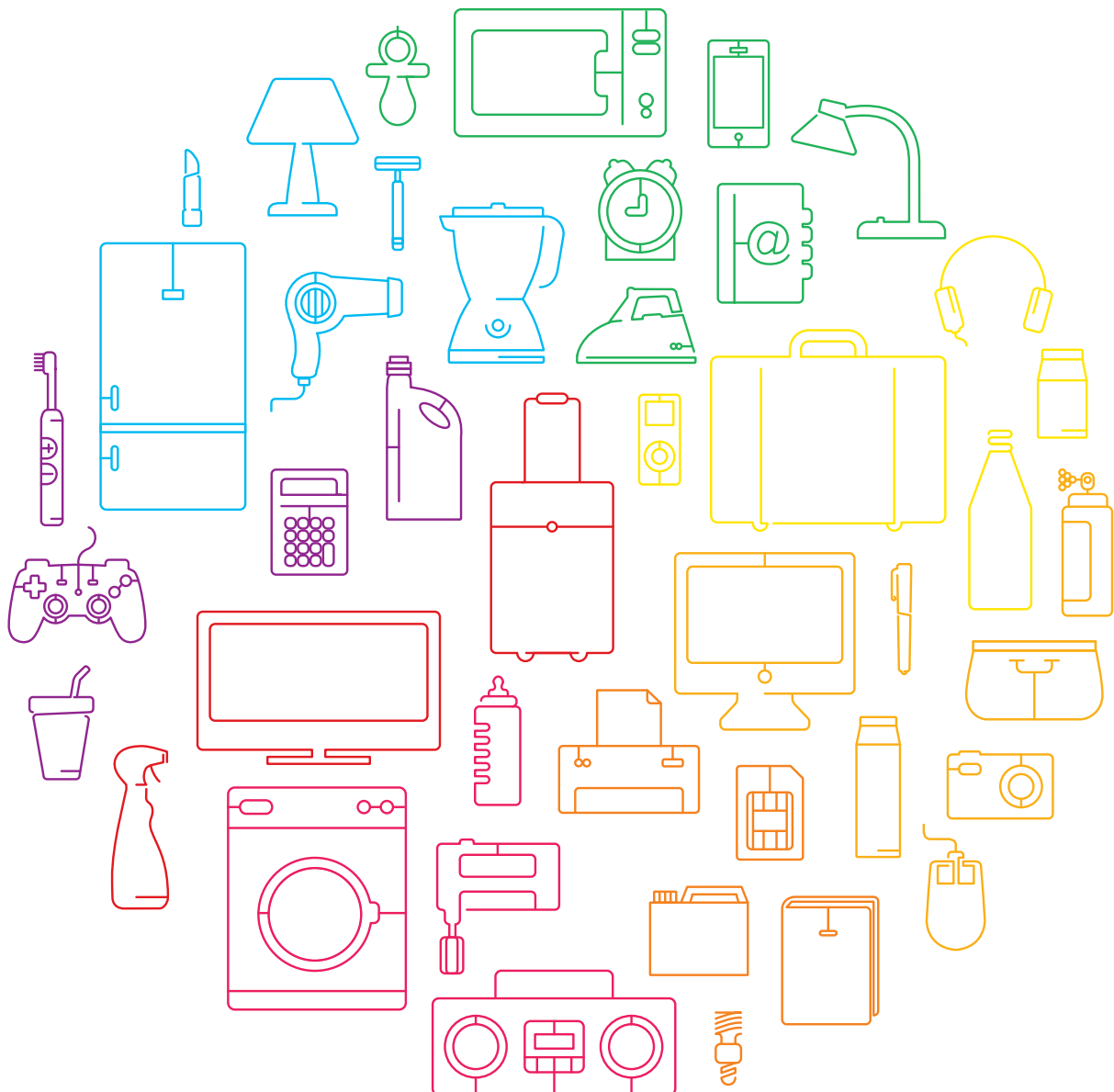
Executive Summary

8 John Adam Street
London WC2N 6EZ
+44 (0)20 7930 5115

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Executive Summary

- > The Great Recovery project, launched in September 2012 by the Action and Research Centre at the RSA, aims to build a cross disciplinary design community that is equipped to support the development of an economy based on resource-efficient principles.
- > According to WRAP, 420m tonnes of material ends up in landfill in the UK every year. That waste could be avoided if we redesigned our manufacturing processes around circular economy principles. This would create new business opportunities, address material security issues and contribute to sustainable economic growth.
- > We have created a network of professionals involved in all parts of the lifecycle of products in our economy, and engaged them in rethinking the design of these products from a circular perspective. We call this the '*Circular Network*'.
- > The Great Recovery has run a programme of workshops, networking and brokering events, presentations, debates and round tables. These have helped build understanding around the principles of closed loop design and the barriers to achieving full circularity. We have mapped these in the '*four design models for a circular economy*'
- > These events have supported Technology Strategy Board's (TSB) 'New Designs for a Circular Economy' competition that has invested £1.25m to 35 cross-disciplinary teams to carry out feasibility studies across a wide range of products and processes.
- > We have developed an online resource that focuses on design for circularity. This includes a growing database of reports, images and information, articles, blogs, Twitter feeds and a dedicated YouTube channel which hosts films of the workshops.

Through the circular network, workshops and teardown observations, we have gained a better understanding of what action and research is required to transform the way society manages resources. We have made a series of key recommendations based on the findings of the first phase of The Great Recovery programme.

We have run seven public workshops, four organisation workshops, two networking evenings and four brokering events across the UK, attended in total by over 500 people. Our website has a mailing list with 3,610 subscribers and we have 1,300 followers on Twitter. Our YouTube channel hosts the 18 films of the workshops, which have been watched 11,000 times. Our blogs and articles have been read by more than 9,000 people globally.

We have mapped the professionals involved in all parts of the lifecycle of products who need to input into the system re-think for designing for a circular economy.

The Circular Network





The Four Design Models

1. Designing for Longevity:

Products on this loop should be designed to have a long life span, extended through user action of upgrade, fixing and repair. Products designed for longevity can be taken apart easily without breaking any security seals or glued components. When these products fall out of favour the user should be encouraged to pass them on. This relationship requires readily accessible information and product service manuals. Transparent supply chains and open-source operating manuals would open up huge opportunities.

2. Designing for leasing/service:

Sellable products are redesigned into a service business model. Digital platforms and changing consumer behaviours are allowing people to share and lease products as an alternative to owning or buying. Service design is a growing area and is a key component to effective circular economics. It allows for higher specifications of design and materials that increase life and durability.

3. Designing for re-use in manufacture:

Designing for re-use in manufacture develops products or their components that can be taken back by business to be re-used or re-built for re-sale. This system would help switch the focus onto value of material rather than volume, and would incentivise investigation into designing products and services that bring used products back into a circular system. This is designing for longevity at a manufacturing scale.

Designing for material recovery:

This model re-captures material through new system designs that guarantee a quick flow of the product into their material stream and back out as a recycled raw material. Fast flowing products and packaging should be redesigned to fit the existing recovery and recycling systems, and comprehensive communications should be created to make sure these materials are put in the right streams by consumers.

1. Skilling up the design industry

- A. Prepare future generations of designers. Embed circularity in the design education system. Sustainable design must not continue to be left behind or added as a last minute thought. Make sustainability a matriculation criterion in every design and engineering degree. Encourage multi-disciplinary learning based on an understanding of the lifecycle of the products and services.
- B. Encourage creative approaches. New and existing tools need to be realigned around the challenge of designing for circularity. Established tools like the teardown process are highly effective but not commonplace in design thinking.
- C. Designers must be bolder and broader. New generations of system thinkers are needed. Designers need to re-set their definition of beauty to encompass the whole circular life of the materials and processes within their product and design out waste.
- D. Re-kindle skills which are in danger of dying out. Encourage investment in capturing dying craft and trade skills in manufacturing and investigate their adaptation for emerging technologies.

Actions:

Develop further and higher education modules to integrate design for circular economy and systems thinking into a wide range of design curricula.

Develop an education programme that encourages cross-curricular learning, connecting designers with engineers, material scientists, anthropologists, marketeers and business students.

2. New business approaches

- A. Redesigning the brief. Businesses must begin to develop design briefs around new business models that take account of provenance, longevity, impact and end-of-life. They must consider a circular approach.
- B. Foster new technological partnerships between the design, suppliers and waste industries. Short lifecycle products such as FMCGs should be redesigned to prioritise full material recovery. Packaging design briefs must match the capability of our recovery facilities and where innovation occurs, it must occur on both sides.
- C. Build incentives to develop and design new industrial symbiotic relationships in business. These systems could potentially bring great opportunities in new markets and create local partnerships and jobs. Investigate networks and information flows to enable these links to develop.
- D. Shift the opinion that design is an 'add-on'. Promote the Technology Strategy Board's competition requirements that partnered the skills of design and business to solve problems through the redesign of whole systems.
- E. Investigate consumer behaviour and attitudes. Create new incentives around leasing and take back. Investigate growing models of consumption that work on collaborative sharing systems and develop new warranties and social trust systems that can be transferable to many products and services.

Actions:

Help businesses to develop briefs that incorporate resource efficiency and closed loop principles. Support the commissioning of effective design that incorporates circular economy principles.

Broker new dialogues between the designers, suppliers and the waste industries to instigate new collaborations for innovation around end-of-life, with an initial focus on packaging.

3. Networks: connecting and collaborating

- A. Create access to new spaces that allow collaborative R&D for businesses and their supply chains to test, trial and design around circular principles and the four design models; design for longevity, design for leasing/service, design for re-use in manufacture, and design for material recovery.
- B. Investigate the common barriers to collaboration in circularity. Explore ways that can encourage frank business learning through the network. Explore the legal barriers and opportunities for closed loop collaboration.
- C. From consumer to user. Build the debate around ownership and how we effect this in the approach to design, and build a movement to redefine the connection with the stuff we consume.
- D. Open up supply chains to scrutiny. Question cheap global production through the advocacy of transparent supply chains by supporting those that campaign and expose bad practice.
- E. Move towards the designing out of built-in obsolescence in products through an investigation to the shift into business models developed around design for longevity.

Actions:

Create a physical space where industry stakeholders can come together to test product, systems and service design, supported by a network of expert consultants.

Develop design standards and tools to support closed loop design and continue to build the online library of open source information about closed loop design and the circular economy.

4. Pushing the policy

- A. Multi-layered packaging which prevents or increases the complexity and cost of recycling should be designed out. At the same time, investment in innovation fully recoverable mono-material packaging should be supported to increase greater resource recovery.
- B. Encourage the transparency of information. Too much knowledge is hidden and left to speculation. Open source service manuals will bring product transparency and allow designers to build in fixability, upgradability and longevity.
- C. Redesign the systems. Transparency in process and supply chains will assist the redesign of systems, build consumer confidence and open up opportunity to make bigger resource efficiencies.
- D. Laws and accreditation must be fit for circularity. Review the laws that hinder re-manufacturing with used components and that make repair an expensive option.
- E. Investigate accreditation systems for recycled materials. Begin to comprehensively test recycled resource materials so that they have potential to attain grade quality levels that are equivalent to their virgin counterparts. This will build confidence for designers to specify and open up new markets for recovering and reprocessing.

Actions:

Open up dialogue with government around new legislation to encourage packaging design for full recoverability.

Encourage companies to provide full operating and repair manuals for all electronic products.

Enable discussions with the Circular Network and government which investigate the legislative barriers involved in moving to a circular economy.