



Circular Economy Innovation Insights:

Reuse and Products as a Service

With thanks to the Circular Economy Programme Partners:

Lead Partner:



Partners:



With support from:



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101019181

Introduction

Our consumption of cement, steel, aluminium and plastics prevents us from reaching our goals of fighting climate change and reducing resource depletion. The production of these four materials alone, according to current trends will result in 920 GtCO₂ emissions by the end of this century.¹ As the global economy continues to grow, consumption of steel and cement could roughly double, aluminium triple, and plastics quadruple by the end of the century. However, many construction clients, contractors, and advisors do not realise that there are already many organisations able to provide reuse material solutions and offer more sustainable service-based solutions over supplying products as per a linear economy.

It is time for a paradigm shift in the way we create our built environment. We need an industry that can respond positively to this challenge through new business models that include providing reused resources and offering services rather than products. The time is ripe for innovation and through these solutions we can start to reduce resource depletion, meet our carbon targets, promote biodiversity, create social value and prevent the negative impacts of waste on the environment.

Everyone in the value chain can play a part in making this happen and this resource is intended to offer inspiration and solutions for change.

¹ Material Economics (2018). The Circular Economy – A Powerful Force For Climate Change Mitigation. Available at: <https://materialeconomics.com/publications/the-circular-economy-a-powerful-force-for-climate-mitigation-1>. [Accessed: 24/01/2020].





Who is contributing solutions to the circular economy?

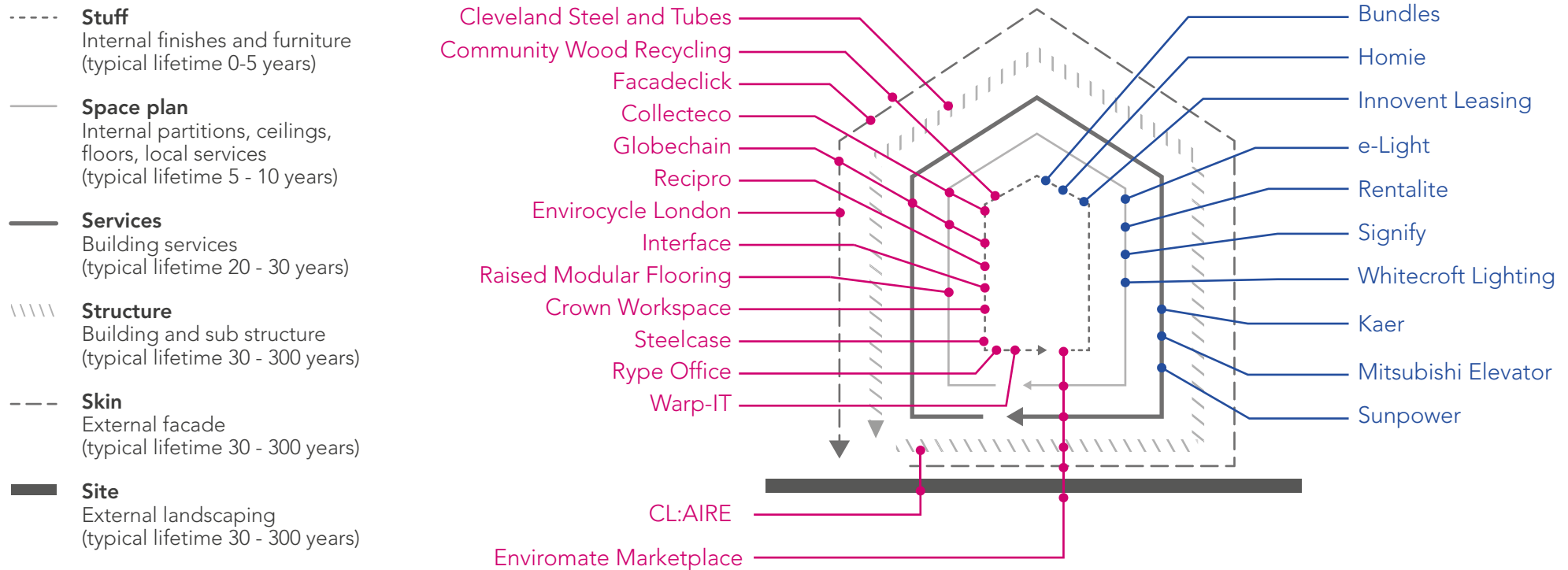
UKGBC posed this question to a number of stakeholders spanning the built environment value chain to uncover which corporates, SMEs and innovators facilitate reuse and offer Products as a Service. This research was conducted for UKGBC's Circular Economy Programme to create both Reuse and Products as a Service Implementation Packs which aim to support the industry in its journey to maximise resource use and reduce greenhouse gas emissions.

These pages explore a range of organisations that offer innovative circular economy solutions relating to reuse and Products as a Service. This document should be used in conjunction with the How-to Guides for reuse and Light as a Service. The hope is for these examples to act as a source of inspiration for the sector, and to help all of us think more creatively about how we can maximise resource use.

To find out more about the UKGBC step-by-step innovation process, and the support it provides, please refer to the [Sustainable Innovation Manual](#).

The Building Material and Product Innovation Map

The Building Material and Product Innovation Map provides a view of where the product and service innovations detailed in this document fit into the building layers. This helps highlight where further opportunities and gaps in the market exist for new innovations and ways of thinking.



Challenge

01 Reusing Materials and Products

- Material 01 Construction material
- Material 02 Fit-out products
- Material 03 Flooring
- Material 04 Furniture and office equipment

Challenge

02 Procuring Products as a Service

- Product 01 Electrical appliances (including IT and white goods)
- Product 02 Energy generation and vertical transport systems
- Product 03 Lighting

Challenge

01

Reusing Materials and Products

How can the sector reuse materials and products from another project?
How can the sector send products offsite for reuse on another project?

Challenge insights:

- Material and product suppliers rarely provide take back schemes to enable onward reuse
- Little is known about what materials and products are available for reuse and where they can be accessed
- Storing materials or products between their availability and requirement often is not practical or financially viable
- Many project teams see the reuse of materials and products as high risk due to warranty and liability concerns as well as aesthetically unacceptable

Material 01 Construction materials



CL:AIRE: a service which facilitates the reuse of soils and aggregate by connecting suppliers with clients

CL:AIRE has developed an online portal which allows organisations to upload excess materials to their site as a donor site of soils and aggregate, then connecting them with organisations looking to acquire the materials.



Cleveland Steel and Tubes (CST): a supplier of steel tubes which operates under a reuse model whereby the majority of pipe is sourced as oil field surplus production

By repurposing steel, CST is able to contribute towards a circular economy as well as create a carbon saving of up to 96% and generate financial savings. To ensure there is no impact on lead times they hold 65,000 tonnes of products in stock. The pipe is made fit for alternative applications, they refurbish the materials in-house to remove excess external coatings which are then recycled and disposed of responsibly. There are no technical, legal or practical reasons steel tubes cannot be reused or repurposed. They have been proven to work over the past 40 years and material properties and traceability have been shown to be at least as good as new products.



Community Wood Recycling: a social enterprise network which sells a range of reclaimed wood for reuse including flooring, doors, window frames, decking and furniture

Community Wood Recycling saves resources by rescuing and re-using waste timber that would otherwise be landfilled (or at very best downcycled into woodchip). This social enterprise creates sustainable jobs, as well as training and volunteering opportunities, for local people – especially those who might find it difficult to get into or back to employment.



Facadeclick: a brick system that can be disassembled and reused

Facadeclick is a dry building system involving facing bricks which click together to form blocks. The Facadeclick system uses no adhesives or mortar, but has innovative connecting parts to join facing bricks. The facing bricks are completely reuseable as a result, after their first, second, third or fourth use.

Material 02 Fit-out products



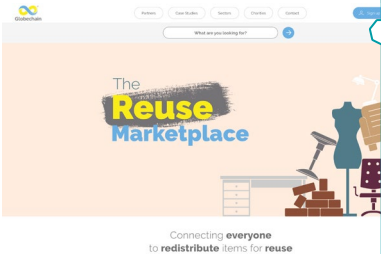
Collecteco: facilitates the collection and donation of surplus furniture equipment and construction materials from business for good causes

Collecteco partners with businesses across the UK to donate furniture, equipment and construction materials to charities, schools, NHS Trusts and other not-for-profit organisations. It does this to empower good causes to maximise their spending on impacting communities and helping people, rather than buying new equipment. Every project generates a social/environmental value report detailing good causes helped, in-kind funding generated, carbon savings and other key facts.



Enviromate Marketplace: an online marketplace for reuse items where they can be sold or donated.

Enviromate Marketplace is a platform for anyone to sell or donate construction surplus construction materials for onward reuse. It also allows users to source unwanted materials from other projects.



Globechain: a reuse marketplace that connects companies with charities, SMEs and individuals to redistribute unneeded construction material while collating social, environmental and economic data

Globechain has created a digital platform which functions in a similar way to eBay. This platform has so far diverted over 5.1 million kgs of waste from landfill through reuse and with over £2m of savings to charities. The platform is able to provide a financial benefit to the organisation looking to remove the materials from their site through the reduced cost of waste disposal. Corporates use Globechain for waste cost reduction and social impact data. Globechain has over 10,000 members and operate in the UK, Spain, UAE and New York.



Recipro: sells surplus stock from contractors and suppliers

Recipro sell discounted products such as paint and furniture donated by contractors and suppliers who have overordered, changed range or returned stock. Typical customers include charities, community groups, families, landlords, renters, churches and schools.

Material 03 Flooring



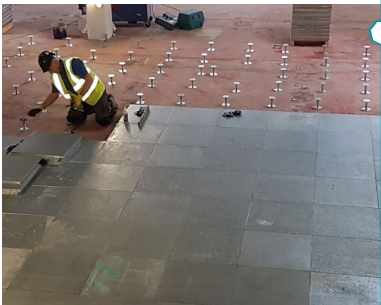
Envirocycle London: a carpet tile reuse programme

In order to avoid carpet tiles going to landfill, Envirocycle London recover used carpet tiles and grade them. These tiles are then supplied to charities, schools, businesses, contractors and the public for reuse. Since starting in 2017 it has prevented hundreds of thousands of carpet tiles going to landfill or being used as waste for energy.



Interface: a carpet supplier offering a take back scheme for carpet reuse

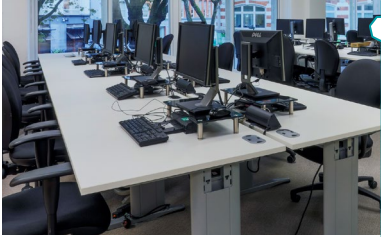
In 2016 – 2018 Interface prevented 3.5 million m² of carpet from going to landfill. Carpet is taken up and palletised on the site by a contractor, Interface come and collect this carpet and take it to a social enterprise who help find a building in which to use it. The carpet is typically reused by charities, community groups and housing associations.



Raised Modular Flooring (RMF): a take back service for raised access flooring which is then sold on for reuse

Raised access flooring by its very nature is a removable and accessible flooring system, which therefore lends itself to the easy reuse of panels. However, the installation process of adhesively fixing pedestals down to the subfloor prevents reuse. Until approximately four years ago reuse of raised access flooring was not being put into practice. Reused modular flooring has the same properties and warranties as a new system as well as providing a substantial cost saving of approximately 20%. The systems are manufactured with a lifecycle of around 25 years for the panels and 50 years for the pedestal (25-year system warranty). RMF has created a facility for reusing raised access flooring panels previously sent to landfill during refurbishment projects.

Material 04 Furniture and office equipment



Crown Workspace: facilitates the reuse of furniture and equipment for businesses

Through a process of auditing, storage and stock control services, Crown Workspace support clients to manage their resources by reusing their furniture, IT and electrical equipment. This is done through an audit of the furniture and equipment, creating an inventory of resources that can be used for future projects. Crown Workspace also offer their clients a resale option for unwanted furniture and equipment. Specialist items can be auctioned off to ensure maximum return. Items with little value can be given away as donations to local schools, social enterprises and charities.



Steelcase: offering reuse options for office furniture

Through an evaluation process, inventories of office furniture are created and options for reuse are offered based on assessing the resale value and acting as brokers for the unwanted furniture. Steelcase also matches used office furniture with non-profit organisations around the globe.



Rype office: supplier of refurbished office furniture

Rype office refurbish existing furniture items, or remanufacture brand name products back to as-new condition with significant cost savings and high quality.



Warp-IT: facilitate the process of organisations accessing, giving away or loaning office furniture, equipment and other resources

Warp-IT's online platform has created a marketplace to redistribute or sell reuse items both within organisations and externally. This process reduces the need to purchase new items, frees up space and reduces office clearance time.

Challenge

02

Procuring Products as a Service

How can assets procure products in a way that makes them more circular, cost effective and energy efficient?

Challenge insights:

- Material and product suppliers' business models are based on a linear financial system and without responsibility for optimal, long term performance
- Material and product suppliers rarely provide take back schemes due to reduced residual value of products at end of life
- Products are often not installed to allow for disassembly and take back
- Procurement teams often don't know how to ask for suppliers to provide a service instead of procuring a product, due to risk and uncertainty

Product 01 Electrical appliances

(including IT and white goods)



Bundles: offers a pay-per-use subscriptions for white goods and coffee machines

Bundles is a Netherlands based organisation offering clean clothes on a pay-per-wash basis, allowing customers to pay for the performance, not the product. In 2017, Bundles also launched CoffeeBundles, a subscription model that provides "Coffee as a service". Customers subscribe to the use of a high quality coffee machine and automatic delivery of coffee beans, based on personal preferences and amount of coffee usage.



Homie: providing white goods as a service through a pay-per-use scenario

Homie is a Netherlands based organization offering an innovative Pay-Per-Use model for white goods appliances since 2016. With Homie you only pay per use, whether you are using a washing machine, dryer or (soon) a dishwasher. They deliver the machine and connect it for you and ensure that the customer always has a working machine at home.



Innovent Leasing: leases high quality refurbished IT equipment to companies and takes it back at end of life for refurbishment and onward re-use

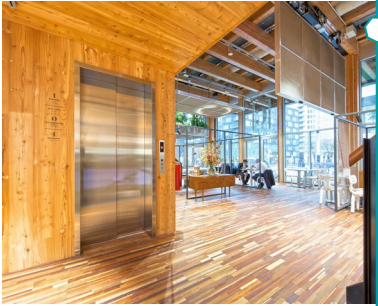
Innovent Leasing lease a range of IT equipment including computers, laptops, mobile phones, servers and more. They lease the latest brand new computers and phones as well as refurbished equipment. They provide a finance model that means low monthly costs and no large up-front payments, so it is cheaper to lease through Innovent Leasing than to buy upfront. Much of the equipment has multiple lives, being re-rented over again, meaning finance deals are cost competitive.

Product 02 Energy generation and vertical transport systems



Kaer: offers air-conditioning as a service (ACaaS)

Kaer takes responsibility for both the design and installation of the air-conditioning system, thereby avoiding over specification, as well as the operation which ensures the system runs more effectively. Through this model, a building owner can purchase air-conditioning at a fixed fee in the form of air-conditioning as a service.



Mitsubishi Electric Elevator Europe: provide lifts as a service through their M-Use function in the Netherlands

M-Use® offers a different model to owning the lift system. Instead Mitsubishi Elevator Europe are the owner of the lift. Mitsubishi Elevator Europe can extend the life expectancy of the elevator through effective maintenance and improved intelligence. When an elevator has come to the end of its life or a contract ends (usually after 20~25 years) they can extend the lifespan up to 40 years. In addition they will look to reuse the components and/or recycle materials, reducing waste to landfill. This model is currently on offer in the Netherlands, Germany and Belgium and is being explored for the UK market. If you wish to know more please contact – lifts-enquiries@meuk.mee.com



SunPower: offers high quality Cradle to Cradle certified solar panels that can be leased

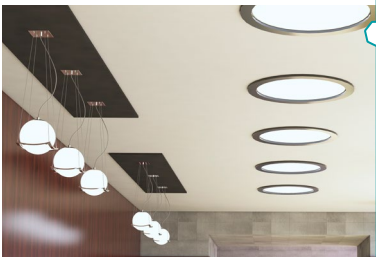
SunPower is a US based organization offering leasing of solar panels. [SunPower solar leases](#) run for 20 years and depending on the lease terms, customers may have the option to purchase the solar panel system at the end of the lease. Otherwise when the lease ends, the lease can be renewed for an additional term or have the leasing company remove the panels. If the property is sold during the lease term, there is an option to purchase the system or transfer the lease to the new homebuyer.

Product 03 Lighting



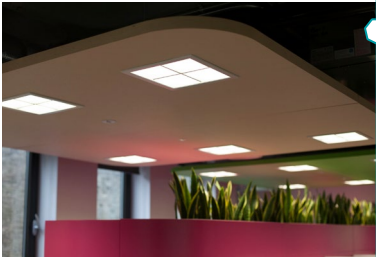
eLight: an eEnergy company providing customers with a competitive switch to green energy and ongoing transparent management of their energy supply

eLight simplify energy efficiency taking a data driven and digital approach to energy projects, enabling schools and businesses to reduce their energy consumption through 'Light as a Service'. This is through funding and delivering energy efficient lighting upgrades in exchange for a monthly fee, funded by the energy savings and requiring no capital investment.



Rentalite: an innovative research and development centre specializing in energy-saving projects

The main focus is new, highly innovative lighting technology specially designed for companies. Rentalite uses a smart instant-profit model which requires no investment, the payback comes out of the Rentalite savings model, with zero maintenance costs during the entire process.



Signify: (previously Philips Lighting) provide Light as a Service, a lighting solution that delivers instant energy savings with no upfront investment, a one-stop shop for performance, operations, maintenance & financing

Signify strives not to sell what they have, but to deliver what the customer really needs. To do so, they will develop a deep understanding of the specific and individual requirements. Based upon real customer needs, a lighting solution is designed that not only delivers what is needed, but exceeds the customer's expectation. By applying this customer centric approach, they will create a solution that pays for itself through the energy savings made.



Whitecroft Lighting: a lighting supplier that offers a product and service that enables disassembly of lighting luminaries for onward reuse

Whitecroft Lighting offers a number of lighting related services that incorporates circularity. This includes commissioning and optimisation of critical life safety systems, service agreements to maintain/upgrade product utility through life, organic response wireless controls to optimise energy, monitoring and upgrade of LEDs at the right payback point, Cradle to Cradle independent accreditation and future improvement plan as well as 'end of life' management including pod upgrade and recovery.



From insight to action

UKGBC hopes that these innovations and new ways of operating inspire further action for material and product reuse as well as procuring Products as a Service.

What you can do to advance innovation that contributes to a circular economy:

- Show this document to colleagues, clients and suppliers, as a snapshot of innovation today.
- Contact the organisations highlighted in this document to implement trials of their products and services.
- Set up a process for your organisation to conduct open innovation, including working with external innovators to develop solutions.
- Tell us about other innovations so we can share them with the rest of the built environment industry.

Tomorrow's ideas and innovations are up to you. Consult the [Sustainable Innovation Manual](#), work through the framework and contribute to a sustainable future.



About the Circular Economy Programme

The UKGBC Circular Economy Programme was launched in Spring 2018. In the first year we worked with our members and other key stakeholders to produce [Circular Economy Guidance for Construction Clients](#), which provides a comprehensive practical guide for those wanting to include circular principles in their project briefs. We also created a web based [Circular Economy Actor and Resource Map](#) of built environment initiatives. The purpose of which is to allow organisations to use existing knowledge and methodologies to successfully implement circular economy principles without repeating the work of others.

The second year of the programme has produced two Implementation Packs, one on Reuse and one on Products as a Service. Throughout the year we also continued wider awareness raising and education events and advocated for progressive government policy.



**UKGBC offers
no commercial endorsement
of individual solutions
mentioned.**

The selected examples are
provided as a source of
inspiration, and we do hope
that you follow up with the
innovators to find out more.

KEY CONTACTS:

Robert Winch
Sustainability Officer
robert.winch@ukgbc.org

Anna Surgenor
Senior Sustainability Advisor
anna.surgenor@ukgbc.org