

Results of competition:

Supply chain innovation towards a circular economy - Collaborative R&D

Total available funding for this competition was £5m from the Technology Strategy Board.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

| Participant organisation names | Project title | Proposed project costs | Proposed project grant |
|---|--|------------------------|------------------------|
| Axion Recycling Limited (lead) Amcor Packaging UK Limited Dow Chemical Company Limited Nestle UK Ltd Sita Holdings UK Limited The Interflex Group Europe Limited Tomra Sorting Limited Unilever Central Resources Limited | Circular Economy for Flexible Packaging - REFLEX | £917,821 | £381,791 |
| Project description - provided by applicants | | | |
| <p>Flexible packaging such as plastic bags, sweet wrappers, frozen food bags and pouches makes up 32% of consumer plastic packaging in the UK, however virtually all of this 556,000 tonnes ends up in landfill. By contrast 58% of plastic bottles are recycled.</p> <p>Our vision is to achieve a circular economy for flexible packaging and divert it from landfill. To achieve this, innovative recyclable flexible package designs are required, where all the materials used can be reprocessed together. The design will include innovative inks, new barrier polymers, novel packaging designs and a new automated sorting technique.</p> <p>With the backing of Nestle and Unilever, two global brands who see consumer value in offering recyclable packaging, industry-wide guidelines for recyclable packaging will be agreed and disseminated. Each step of the process will be trialled during this project, thus demonstrating to the full supply chain that it is viable to create a circular economy in plastic flexible packaging.</p> | | | |

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| Cool-Curve Limited (lead) Agency of Design Cyan Technology Limited Havells Sylvania Europe Limited Kingfisher Plc | Consumer Lighting as a Service (CLasS) | £703,533 | £419,811 |
| Project description - provided by applicants | | | |
| <p>Traditionally light bulbs have been thrown away at the end of their life. The advent of LED technology enables products that use dramatically less energy and have lifetimes that are orders of magnitude longer, thus imposing a new model on the industry. However, even with this longer life there will be millions of lamps that will reach end of life and require disposal, creating a substantial Electronic Waste (WEEE) issue. Current rates of recycling have reached 39.5% by weight, almost all from commercial lighting.</p> <p>This project will create and test the supply on a lease basis a range of attractive ultra efficient light bulbs to the consumer market where the lease cost will be on average lower than the energy saving, thus reducing the consumer's cost of lighting while overcoming the current high cost barrier to the latest LED technology. Connectivity within the lamp will not only enable wireless control but also signal near end of life allowing the lamp to be returned, remanufactured and reused, enabling over 95% of the materials to be returned to productive use in a product with the latest specification and fashion.</p> | | | |

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| ICI Paints Limited (lead) New Life Paints Limited Seymourpowell Ltd | Project Recover 2.0: New Life from Old Paint | £367,753 | £188,872 |
| Project description - provided by applicants | | | |
| <p>This project will develop circular supply chains, technologies and products to get new life from old paint. 50m litres of paint are believed to go unused each year in the UK, wasting valuable and scarce resources and clogging our landfills. A better option is to recycle and reuse it: making paint from paint. Such paint recycling businesses and processes do exist, but are in their infancy, facing technical and commercial challenges in reprocessing it efficiently and effectively and then selling it.</p> <p>Project Recover aims to develop technologies to more efficiently extract paint from old, used tins; identify technologies for more effective colour matching of recycled paint; and work with end-customers to design new propositions and business models that help enhance the value and perception of recycled paint. Doing this can avoid 60k tonnes of waste ending in landfill and introduce mainstream recycled paint products with a 50% lower carbon footprint than current new paint but with no loss of quality and at a competitive price.</p> | | | |

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| Jaguar Land Rover Limited (lead) G&P Batteries Limited Potenza Technology Limited University of Warwick | innovAtive Business models and design Approaches for extending the in-serviCe battery life of fUture low carbon vehicleS (ABACUS) | £940,145 | £594,982 |
| Project description - provided by applicants | | | |
| <p>This ABACUS project is directly aligned with the research challenge of preserving the value of products at end-of-life and keeping them in productive use for longer. The consortium is led by Jaguar Land Rover and includes G+P Batteries, Potenza Technology and the University of Warwick – WMG.</p> <p>The ABACUS project aims to achieve a waste stream reduction of 50%-70% through new business models and new innovative approaches to battery system design that (a) support the in-service life of the battery and (b) extend its productive life beyond first vehicle installation.</p> <p>The project will define the complete value chain for the battery. It will identify key breakpoints, for example when it is economical to service, test, recover, remanufacture and redeploy the battery. The project will address the strategic need for accurate and easily obtained data for driving commercial decisions that are economically viable and environmentally sustainable.</p> <p>For the first time, strategic circular economy principles such as prevention, modularity, re-purposing and re-manufacture will be embedded with traditional automotive targets for reduced product cost, weight and volume.</p> | | | |

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| Marks and Spencer Public Limited Company (lead) University of Cambridge | REDRESS - Driving garment recovery and retained value | £815,350 | £529,938 |
| Project description - provided by applicants | | | |
| <p>This project seeks to accelerate our Plan A commitments around reducing waste. The focus for this project will be to reduce the environmental impact of raw materials in M&S' clothing supply chain.</p> <p>We will apply circular economy thinking to drive greater garment recovery and retained value. The outcomes of the project can be applied to textile and other industries.</p> | | | |

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| MDF Recovery Limited (lead) Axium Process Limited Bangor University Bouygues E&S Contracting UK Limited C-Tech Innovation Limited Helistrat Management Services Limited Natural Building Technologies SITA UK Limited | Medium Density Fibreboard: Enhancing Supply Chain Value | £925,367 | £536,667 |
| Project description - provided by applicants | | | |
| <p>This project seeks to disrupt the existing life-cycle of medium density fibreboard. It will develop a technology that will be capable of recovering high value wood fibres from a waste stream that is still often landfilled or incinerated. It will pursue a closed loop agenda, making available industrial products made from the recovered fibres. The impacts along the supply chain will be evaluated and mapped with new systems designed for the recovery, segregation and utilisation of these products and processes.</p> | | | |

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| Microcab Industries Limited (lead) Env-Aqua Solutions Limited Greater London Authority High Speed Sustainable Manufacturing Institute MCT Reman Limited | Fuel cell recovery project | £453,847 | £328,899 |
| Project description - provided by applicants | | | |
| <p>The proposed project aims at generating new knowledge in establishing how Hydrogen Fuel cell systems (HFC) in Fuel Cell Electric vehicles (FCEVs) can be recovered once they reach the end of their life (i.e. are worn out/have failed) so that their optimal value can be recuperated and their life in service can be kept in circulation to ensure sustainability.</p> <p>As part of the automotive industry's ongoing efforts to lower CO₂ emissions by 80% before 2050, many vehicle manufacturers, such as Hyundai, Toyota, and Honda have started to turn their attentions towards the development of zero carbon emitting FCEVs. It is anticipated that by 2030 there will be in excess of 1.3million FCEVs on UK roads, and by 2050, will account for up to 30% of the total vehicles on UK roads. When these vehicles reach the end of their life, the automotive industry and producers of the fuel cells will become accountable for the responsible collection, recovery and disposal of them under the ELV directive. At present, little research has sought to establish how to do this.</p> <p>This project is focused on the development of new product, process and business designs to enable fuel cell recovery.</p> | | | |

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| Nike UK Limited (lead) Imaginals Limited University of Cambridge University of the Arts London | Re-Making | £963,023 | £624,337 |
| Project description - provided by applicants | | | |
| <p>Re-Making is a collaborative pilot project led by Nike, applying circular economy principles in order to retain value, increase efficiency and reduce environmental impact of supply chains in the UK sportswear sector. It engages an inter-disciplinary R+D process managed by Nike with partners including Centre for Sustainable Fashion at University of the Arts London and EPSRC Centre for Industrial Sustainability at University of Cambridge.</p> <p>The pilot project will bring together academic and industry expertise from fields such as materials science, fashion service and product design, business model innovation and marketing to develop a programme that embeds circular economy principles in Nike's design, processing, business model, retail and marketing practices. Currently only a fraction of its value is recaptured at end of a Nike product's life. There is considerable potential for Technology Strategy Board-supported innovations to be scaled up into major value retention: boosting efficiency and economic value, developing a circular supply chain within the UK which could boost domestic employment and have a transformative impact across the sportswear and wider fashion sectors.</p> | | | |

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| Tata Steel UK Limited (lead) Metallisation Limited TWI Limited Wall Colmonoy Limited | Refurbishment of torpedo ladle and locomotion axles through Laser Applied Surface Engineering (Re-LASE) | £851,955 | £561,064 |
| Project description - provided by applicants | | | |
| <p>The highly demanding in-service conditions of torpedo ladle axles in steel production and high speed locomotion axles result in high levels of abrasive wear and fatigue on short timescales, thus contributing to high scrappage rates. Applying a suitable Laser Engineered Coating (LEC) on to worn ladle and locomotive axles will generate large savings on replacement costs, as well as eliminating the CO₂ burden of manufacturing new components.</p> <p>LEC technology is a recent development, successfully implemented in a variety of applications where resistance to wear is the foremost consideration and fatigue performance is not seen as important. The lack of development of metallurgical powders which lead to enhanced fatigue performance has limited the growth of LEC into much broader applications, such as the aforementioned axles, where behaviour under cyclic stress is a key concern for safety reasons. Therefore in this project a comprehensive programme of powder and LEC development will be performed to produce new coatings optimised for combined high fatigue, wear and adhesion performance, which will be validated through both destructive and non-destructive evaluation.</p> | | | |

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| Tetronics (International) Limited (lead) Metech Recycling (UK) Limited Vale Europe Limited | High Efficiency Precious Metals Recovery from E-waste | £974,137 | £572,682 |
| Project description - provided by applicants | | | |
| <p>The aim of this project is to both shorten the supply chain and halve the overall losses of precious metals (PM) during their recovery from e-waste. This project will enable the UK to disrupt this inefficient chain and create an indigenous business, leading to self-sufficiency, from an estimated 400k tpa e-waste arising.</p> <p>The project represents a route to achieving the missing links in the circular economy business model based on the existing pure metal to product recycling industry. This will be achieved through the combined partners' expertise in waste collection and sorting; smelting based efficiency PM recovery and refining. Novelty is both commercial, in the integrated business approach, and technical in the use of a copper-based recovery process, instead of the iron-based process used for high efficiency PM recovery from catalysts.</p> <p>This programme aims to develop a sustainable process for maximising the value of PM recovery by the development of novel waste processing technologies, with higher recovery efficiencies and lower environmental impacts, complimentary to the trend in commerce to move away from ownership to service-based models, with life cycle material management.</p> | | | |

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| Victrex Plc (lead) C-Tech Innovation Limited Urenco Chemplants Limited | Development of a circular economy for fluorine | £545,772 | £280,613 |
| Project description - provided by applicants | | | |
| <p>Fluorine is an industrially important and widely used chemical element. It is derived almost solely from the mineral fluorspar, supplies of which are becoming scarce, to the extent that this mineral has been identified as one of 14 "critical" raw materials by the European Commission.</p> <p>In order to reduce consumption and reliance on supplies of this valuable mineral resource, Victrex plc, C-Tech Innovation Ltd and Urenco Chemplants Ltd have come together on this project to develop an electrochemical technology which has the potential to be used to recycle 90% of the fluorine which currently ends up as aqueous effluent. In addition to recovering fluorine, the process also generates water and dilute sodium hydroxide as by-products, both of which can be recycled, thus further reducing reliance on natural resources.</p> <p>As well as the obvious environmental benefits associated with developing such a process, there are also significant economic benefits envisaged, ensuring that jobs are safeguarded and that UK manufacturing remains competitive in a Global arena.</p> | | | |