Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University of Manchester	One Bin To Rule Them All: Modern Waste Management Toward Zero Plastic Release	£1,107,613	£886,090

Project description - provided by applicants

The ‘One Bin to Rule Them All’ project aims to improve compliance with recycling through a systemic approach to plastic waste management. The project aims to demonstrate a viable system to reduce and then eliminate plastic release in the environment by identifying and creating value in plastic packaging waste streams and simplifying recycling for consumers. To achieve this, The University of Manchester has brought together a cross-sector consortium of 17 industry partners and local authorities to help solve three key challenges in the plastics life cycle; improving methods of chemical and mechanical recycling; developing business models to derive value from reused plastic for industry; and understanding consumer practices that lead to enhanced recycling compliance. The project pulls together expertise in polymer science (Prof Michael Shaver, Director of the Sustainable Materials Innovation), new business models (Dr Maria Sharmina, Tyndall Centre for Climate Change Research) and societal practice in circular economies (Dr Helen Holmes, Sustainable Consumption Institute).

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University of Manchester	Post-Consumer Resin - Understanding the quality performance linkage for packaging	£175,351	£ 140,281

Project description - provided by applicants

Bottles for home and personal care products such as shampoo and bleach are often made of high-density polyethylene (HDPE) and about 150,000 tonnes of this packaging are produced annually. After use, empty bottles can be collected sorted and mechanically recycled as “post-consumer plastic”. This recycled plastic can be blended with virgin (new) plastic to make new HDPE packaging. Recycling HDPE this way saves on waste and reduces Greenhouse Gas emissions.

However, the recycled plastic is a highly variable material and incorporating recycled plastic into new bottles can reduce the performance of the packaging. This problem is limiting industry’s ability to improve sustainability in packaging.

Our project aims to understand how HDPE changes during recycling and we will use this knowledge to invent ways of improving the post-consumer recycled plastic so that more can be used to make HDPE bottles. This change will result in less plastic waste, increased sustainability in plastic packaging and less harm to the environment.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University of Cambridge	Smart Sustainable Plastic Packaging from Plants (S2UPPlant)	£ 1,039,964	£ 831,971

Project description - provided by applicants

We want to supplant the widespread use of fossil-derived plastics with materials made from naturally derived sources, such as wood (cellulose) and plants (sugars). These materials will degrade more easily in the natural environment, and result in no additional carbon being returned to the biosphere. By changing the genetic code of the plants, or blending with other additives from food or agricultural waste, we can engineer materials with new functional properties, such as improved strength or better protection, resulting in a reduction in overall volume of plastic packing needed to keep food fresh. By assessing the impact of switching to cellulose and plant-derived sugars, and making better use of waste products from food and forestry industries, we will explore the trade-offs between the benefits of plastic packaging and the impacts of its production and disposal. Success of the project will result in fulfilment of many of the UK Plastic Pact 2025 challenges and help to achieve the objective of establishing the UK as a leading innovator in smart and sustainable plastic packaging.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University of Strathclyde	Biocomposite design for food packaging	£ 1,003,353	£ 802,682

Project description - provided by applicants

The UK uses 5 million tonnes of plastic every year, nearly half of which is used in packaging. We must all learn to reduce our reliance on plastic and to reuse and recycle as much of this plastic as we can, yet this is not always easy. Much of the packaging we use is essential for keeping our food safe and fresh but is impossible to use or recycle this packaging due to contamination by the food. Moreover, traditional plastics are derived from fossil fuels and will persist in the environment for decades. This is where sustainably-derived, compostable plastics come in! Not dependent on fossil fuels and safely compostable in municipal composting plants that exist all around the UK, these plastics are the ideal solution to the problem of food packaging waste. By understanding and tailoring their critical properties our project aims to optimise these compostable plastics for multiple food packaging applications.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
Lancaster University	Plastic Packaging in Peoples' Lives (PPiPL): Bridging the consumer attitude behaviour gap	£ 935,810	£ 748,648

Project description - provided by applicants

The PPiPL project aims to fundamentally shift behaviours around food plastic packaging. Combining excellence in marketing, supply chains, waste management, chemistry and material science, PPiPL will deliver innovative solutions in the drive to eliminate problematic or unnecessary plastic waste. Focusing on how plastic packaging is embedded in consumers' day-to-day lives, the project will undertake a holistic examination of the packaging supply chain to close the attitude-behaviour gap in consumers' approaches to plastic usage and wastage. Working in collaboration with partners, business, government, other researchers and households, our goal is to provide actionable guidance for policy, key supply chain stakeholders and consumers to drive towards cleaner, greener growth.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University of Sheffield	Many Happy Returns - Enabling reusable packaging systems	£ 1,242,372	£ 993,898

Project description - provided by applicants

Recycling has become the norm for addressing our problem with plastic waste, but recycling is challenging and enables and permits a throwaway culture. This project will explore reusable packaging systems that have the potential to reduce the environmental impact of single-use plastic packaging by keeping packaging material in circulation for as long as possible.

A multidisciplinary team of scientists will work in partnership with packaging manufacturers and designers, brand owners, retailers and policy makers to (i) look at the language that people use to describe different types of plastic and actions associated with their reuse and disposal, (ii) examine historical and contemporary models of reuse (e.g., doorstep delivery of milk, supermarket refill stations), (iii) identify what people might be willing to reuse, when, and why, (iv) assess the environmental impacts of a range of different reuse models in a range of different contexts, and (v) investigate the suitability of current and emerging plastics for reuse.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
City, University of London	Reducing plastic packaging and food waste through product innovation simulation	£ 922,021	£737,617

Project description - provided by applicants

This research project will expand and enhance the Household Simulation Model to focus on plastic food Packinging to help manufactures provide the right type of packaging to reduce both food and plastic waste. the Household Simulation Model is currently used by WRAP and industry to reduce food waste in many food products (see for instance this new joint campaign by milk producer, Arla Cravendale and the Tesco supermarket that put into place the findings of the Household Simulation Model .

The new Household Simulation Model will incorporate assessment of plastic packaging changes and food waste reduction trade-offs with environmental and economic impact metrics. The interdisciplinary project team (City, Greenwich and Sheffield) hope to also build a network of users the model over the project so that plastic can be reduced throughout the food system.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University College London	Compostable plastics: unlocking existing barriers to systems change	£ 1,149,682	£ 919,746

Project description - provided by applicants

UK companies are now offering a vast range of biodegradable and compostable materials that are designed to replace single-use plastic packaging in products such as nappies, wipes, and take-away food packaging and ready-meal trays. We know from the results of our citizen science experiment, the Big Compost Experiment, that the public are hugely enthusiastic about this and are more likely to buy packaging labelled as “biodegradable” or “compostable”. Thus it is likely that the sector will continue to grow rapidly. However, there are serious systemic problems to solve if this growth is not to result in the unintended consequence of contaminating recycling systems and the environment. Our research will produce the underpinning scientific evidence, systems analysis and policy recommendations essential for a functioning system for compostable plastics in the UK. The project legacy will be that citizens will know where to dispose of compostable plastics so that they are effectively composted, and why it is important for soil health, biodiversity and for reducing CO2 emissions.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
Brunel University London	Providing the 30% recycled content for food packing (PFP)	£ 566,343	£ 453,074

Project description - provided by applicants

Brunel University London will bring together leading experts from physical, engineering and social sciences and industry to address the problem of hard-to-recycle plastics packaging. The COVID-19 pandemic has exacerbated the challenge of waste from single use packaging, but current automated sorting techniques are unable to distinguish between food-grade and non-food-grade packaging. This means high value polymer resins are consigned to low quality uses, landfill and incineration. Our project aims to sort these waste streams into high value materials by keeping food grade and non-food grade plastics separate. This ambitious project offers fresh insights by including perspectives from business, policy-makers and consumers. It will help position the UK at the forefront of innovation in sorting hard to recycle plastics and contribute towards developing a circular economy globally.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
Loughborough University	Perpetual Plastic for Food to Go (PPFTG)	£1,127,952	£ 902,362

Project description - provided by applicants

This innovative multi-disciplinary project will develop, prototype, and evaluate a novel circular business model that combines smart-technology enabled products and services to reduce the environmental, societal, and economic impact of food-to-go packaging. Food-to-go, fresh and chilled foods such as sandwiches and prepared salads sold by food retailers for consumption out of the home, is a growing UK market driven by the rise in convenience lifestyles that at present yields a significant amount of single-use packaging waste. Recognising that no one single approach will overcome all problems, we bring together academics with expertise in sustainable design, sustainable manufacturing, and polymer chemistry with project partners that represent the interests of all operators and stages within the food-to-go supply chain; from manufacturer through to retailer. Together, we will use a combined approach of novel smart technologies and quality assurance methods, in-depth understanding and modelling of consumer behaviour, and comprehensive supply chain value assessment to propose a novel future food-to-go circular product-service system.

Results of Competition: ISCF Smart Sustainable Plastic Packaging Challenge

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
University of Liverpool	Post-Consumer Resin - Understanding the quality-performance linkage for packaging	£ 958,796	£ 740,407

Project description - provided by applicants

Bottles for home and personal care products such as shampoo and bleach are often made of high-density polyethylene (HDPE) and about 150,000 tonnes of this packaging are produced annually. After use, empty bottles can be collected sorted and mechanically recycled as “post-consumer plastic”. This recycled plastic can be blended with virgin (new) plastic to make new HDPE packaging. Recycling HDPE this way saves on waste and reduces Greenhouse Gas emissions.

However, the recycled plastic is a highly variable material and incorporating recycled plastic into new bottles can reduce the performance of the packaging. This problem is limiting industry’s ability to improve sustainability in packaging.

Our project aims to understand how HDPE changes during recycling and we will use this knowledge to invent ways of improving the post-consumer recycled plastic so that more can be used to make HDPE bottles. This change will result in less plastic waste, increased sustainability in plastic packaging and less harm to the environment.