

## **EXEMPLAR: The Exeter Hub for a Circular Economy for Plastics.**

**Background.** The elimination of plastic waste and creation of maximum value from the use of plastic is one of society's grand challenges. Tackling this problem requires large scale systemic innovation across industrial value chains within a framework of circular economy (CE). This requires integration of circular design principles, co-ordination of reverse material flow networks, new business models and design of new plastic circulation systems, creating enabling conditions at multiple scales that will lead to substantial economic, environment and health benefit. We are ideally placed to tackle these challenges, with an outstanding track record in CE approaches, illustrated by recent institutional investment in the interdisciplinary **Centre for Circular Economy (ECCE)** encompassing 5 Colleges and 50 academics. We are an Ellen MacArthur Foundation Global Pioneer University for CE and lead their MasterClass Programme '**Closing the implementation Gap**', with a strong emphasis on the challenge of plastic waste in global supply chains. We have world-leading expertise in environmental risk assessment of complex, persistent materials, winning the Guardian University Award 2018 for our pioneering work on microbeads. We are experts in **safe-by-design** approaches to minimise ecological and health impacts of new substances, and in conducting population-based interventions. We have proven expertise in the co-design of secure Water Systems and novel materials, aiming to keep recycled materials out of the waste stream and create enhanced value products. This proposal will bring these individually excellent activities together into a single, highly visible institutional platform: **EXEMPLAR: The Exeter Hub for a Circular Economy for Plastics**. Working across scales from regional to national and global systems, EXEMPLAR will focus activities and leverage funding, infrastructure and external partnerships to co-design, innovate and integrate novel solutions that accelerate the transition to a new plastics economy. EXEMPLAR will initially comprise **16 core academics**, encompassing expertise in business, manufacturing, data analytics and artificial intelligence, environmental sciences, psychology, health, law and business. We will build on our strong foundations of UKRI/EU funded work on CE systems for food and drink sectors, building and construction (Business School, Engineering), design of polymers decoupled from fossil fuel feedstocks (Engineering), and health impacts of human activities on the natural world (Biosciences, Environmental Sustainability Institute, Exeter Medical School). EXEMPLAR will enable **exciting new collaborations**, e.g. with human geographers, psychologists and business experts to determine earth system tipping points, the role of civil society in consumption patterns and to build policy and legislative perspectives into governance. Our growing networks of **project partners** includes the Eden Project, Marks and Spencer, Coca Cola, Renault, Sea Salt, H&M, WRAP, Plastics Europe, Food Packaging Forum, EA, DEFRA, Devon and Cornwall County Councils, NGOs; links with national and global projects (New Plastics Economy, Plastic Pact); design innovation companies and startups (e.g. Materiom, A Short Walk, Ideo).

**Our programme of work** combines 2 interlinked strands: [1] **Capacity and capability:** People-based activities will include intensive boot camps, hackathons, design sprints and workshops, industrial engagements and study visits. Through co-creation with stakeholders and practical demonstrations, these will build knowledge about the systemic nature of the plastic challenge and leverage Exeter research to deliver transformative systems-oriented innovations, following 4 major themes. **Diagnostics:** measuring, quantifying and evaluating the health, ecological and social drivers, pressures and costs of plastic waste at various scales; testing new standards. **Supply side Intervention:** Developing materials and tracking systems (e.g. blockchain, AI, big data) for future packaging, improving techniques for incorporation of recycled plastics into new products, testing options for durability, reuse, and reduction. **Demand Side Interventions:** measuring, quantifying and evaluating consumer acceptance of novel circular packaging propositions in diverse contexts. **System level enablers:** Radically re-thinking policy, regulation, incentives, subsidies and taxes to influence the system. [2] **A Regional Demonstrator:** An initial portfolio of interlinked projects will target specific solutions and build on our excellent regional networks, providing exemplars for upscaling to (inter)national scales across the 4 themes; e.g. mapping regional health and wellbeing, environmental and social impact and costs of plastics, reducing and eliminating single use plastic from selected regional supply chains (clothing, food and drink), prototyping high value upcycled products from recovery and re-use of existing plastic flows (e.g. Local authority flows, Ocean debris from regional beaches), exploring societal barriers to their uptake. We confirm our enthusiasm, ability and Institutional readiness to spend funds between Jan 2019 and June 2020.