The basic ideas behind the research cluster are: making the plastics value chain circular, less extraction of fossil resources, using products for a long time, and reducing end-of-life losses. The switch-over from a linear to a circular plastics economy only succeeds with a multi-stakeholder approach. To this end, three divisions and six research departments are researching systemic, technical, and social innovations – over the entire life-cycle of plastic products.

Contact us and let us inspire you, too.

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Fraunhofer Clusters of Excellence combine the competencies of several institutes to investigate relevant topics with scientific excellence. The aim is to establish virtual institutes with international visibility. With the “Circular Plastics Economy” cluster, Fraunhofer is accompanying and shaping a sustainable transformation path, as economic developments and social consequences of the plastics economy are also analyzed and integrated into the developments.
After stone, bronze, and iron, which have shaped epochs, plastics complete the mix of materials in our present and future. Plastics shape our lives and make them easier. Plastics are used in almost all areas of medicine. A quarter of a car consists of various plastics. Whether electronics, cosmetics or home furnishings – the versatile material is used everywhere. Plastics are light, functional and inexpensive and are therefore indispensable for resource-efficient products. As a result of inefficient or absent recycling systems within the linear plastics economy, too much plastic is burned or released into the environment. Its image as a disposable article and environmental sinner overshadows the view of plastic’s enormous potential for the future.

One thing is clear: It is neither possible nor sensible to renounce plastic. A fundamental change in how we deal with the polymer all-rounder is the only way: The plastics economy must become circular! But what does a plastic need to be like in order for it and the products made from it to no longer be disposed of after use but instead become new products? And: If the plastics do ultimately end up in the environment after all, how can they be degraded quickly and without leaving any residues? As part of the Cluster of Excellence “Circular Plastics Economy”, five institutes of the Fraunhofer-Gesellschaft are investigating these questions and, together with stakeholders, developing system services for a functioning circular plastics economy.

Fraunhofer offers new system services for plastics within the circular economy across industry boundaries: from evaluation tools, circular product designs, prototypes, and recycling to acceptance processes and business models. New developments from the Materials and Systems divisions are demonstrated in prototypes, tested in practice, and marketing strategies suitable for circular products are developed.

We want to use plastics from a sustainable mix of resources to develop functional and long-lasting materials and close material cycles. Formulations for polymers and compounds are themselves based on circular principles. New additive systems provide for stable recyclates, multiple recycling loops, and – where necessary – controlled degradation in the environment.

Efficient collection and transport technologies go hand in hand with new material recycling processes, and digitally mapped processes lead to optimal value creation cycles. Intelligent collection, sorting, and recycling technologies allow monomers and polymers to be recovered and fed back into production. Innovative methods for system analysis help to establish efficient logistics and to evaluate the life-cycles of circular products.

Further Information
www.ccpe.fraunhofer.de

Research Departments
- Circular Polymers
- Circular Additives and Compounds

Research Departments
- Advanced Recycling
- Circular Logistics and Sustainability

Research Departments
- Application and Demonstration
- Business and Transformation
Building a virtual institute together

In the research cluster, plastics are used as an example to investigate how an entire value chain can be designed according to the principles of the circular economy. The directorate and staff of the five Fraunhofer Institutes IAP, ICT, IML, LBF, and UMSICHT are looking forward to building a virtual institute for the circular plastics economy – jointly, competently, and with great enthusiasm for the topic.

Contact us and let us inspire you, too.

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