

ENSURE – Holistic Strategies for Handling Plastics

Plastics in the Environment – Sources · Sinks · Solutions

Plastics are durable, versatile and inexpensive to produce. While these characteristics are advantageous for production, they may have adverse effects when large amounts of plastics enter the environment uncontrolled. In particular, the extreme longevity and durability on both land and in water lead to accumulation of plastics in large quantities. The joint research project ENSURE pursues a holistic approach to reduce plastic in the environment as well as the related negative consequences. In this regard, the partners seek to develop environmentally friendly plastics. Further goals include improving methods of analyzing the environmental impact of plastics and developing strategies to promote more conscious consumer behaviors.

Detecting and Measuring Plastic Loads

Plastics are often released into the environment through so-called littering – careless disposal – and the use of secondary raw material fertilizers such as sewage sludge and compost in agriculture. In order to obtain more detailed findings about the environmental impact of plastics, the seven project partners from science and research are examining soils, wastewater treatment plants, compost, and biogas plants. Initially, they will develop sampling strategies in order to carry out investigations on the occurrence of plastics within these plants.

Within the project, researchers seek to further develop novel remote sensing methods to comprehensively detect



Researchers are testing various sensors and cameras for detecting and monitoring plastics in the environment.

plastics in the environment. The aim is to devise a multisensor system that indicates the type and extent of potential environmental impacts of plastics. The project participants expect to produce fast and simple mapping through airborne reconnaissance methods. This corresponds to a global demand for innovative and rapid detection methods for plastic pollution.

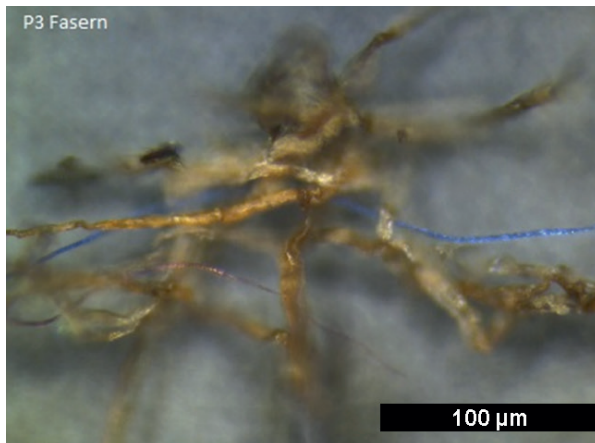
Development of Environmentally Friendly Plastics

In the next stage, the project partners seek to develop industrially relevant plastics with environmentally optimized degradation behavior. This concerns in particular PE and PET – the plastics most widely used in Germany for beverage packaging – as well as PBAT, which is often used for films. The materials should be just as stable as before, but able to degrade faster and more sustainably. This will be achieved through suitable additives that influence degradation capabilities. The entire value chain of the developed materials will also be examined. Their physical, chemical and biological stability will be tested throughout their processing. The researchers are also focusing on how the new plastics affect small animals living in soils, such as worms and mites. Whether these materials are really environmentally friendly will be tested in experiments on biological degradation of plastics.

Plastic manufacturers should be able to produce the materials developed through this project without altering their plant technology. Manufacturers, plant constructors and their operators will be able to incorporate environmentally friendly plastics into their portfolio and expand their business areas. Further major market potentials exist in the packaging, construction, agriculture and textile sectors.

Strategies to Promote Sustainability

Another component of the ENSURE joint research project focuses on consumers and their behavior in regard to plastic products. Using expert interviews, focus groups, qualitative indepth interviews and an online survey with selected target groups, the common perceptions and behavior patterns in dealing with plastic will be recorded and analyzed. The researchers want to use this data to develop behavioral offers and messages that motivate consumers to buy and use less plastic.



Microscopic image of plastic fibers whose biodegradability is being investigated in this joint research project.

Research Focus

Plastics in the Environment – Sources • Sinks • Solutions

Project Title

Development of New Plastics for a Clean Environment by Determining Relevant Entry Points (ENSURE)

Grant Number

02WPL1449A-G

Duration

April 1, 2018 – March 31, 2021

Funding Volume

EUR 2,808,499

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Website

www.ensure-project.de

Publisher

Federal Ministry of Education and Research (BMBF)
Department of Resources, Circular Economy; Geosciences,
53170 Bonn

Editorial Work and Design

Project Management Agency Karlsruhe (PTKA)

Print

BMBF

Photo Credits

Front page: Helmholtz-Zentrum Potsdam Deutsches GeoForschungszentrum (GFZ)
Back page: Universität Stuttgart, Institut für Kunststofftechnik (IKT)

Version of

November 2018

www.bmbf.de