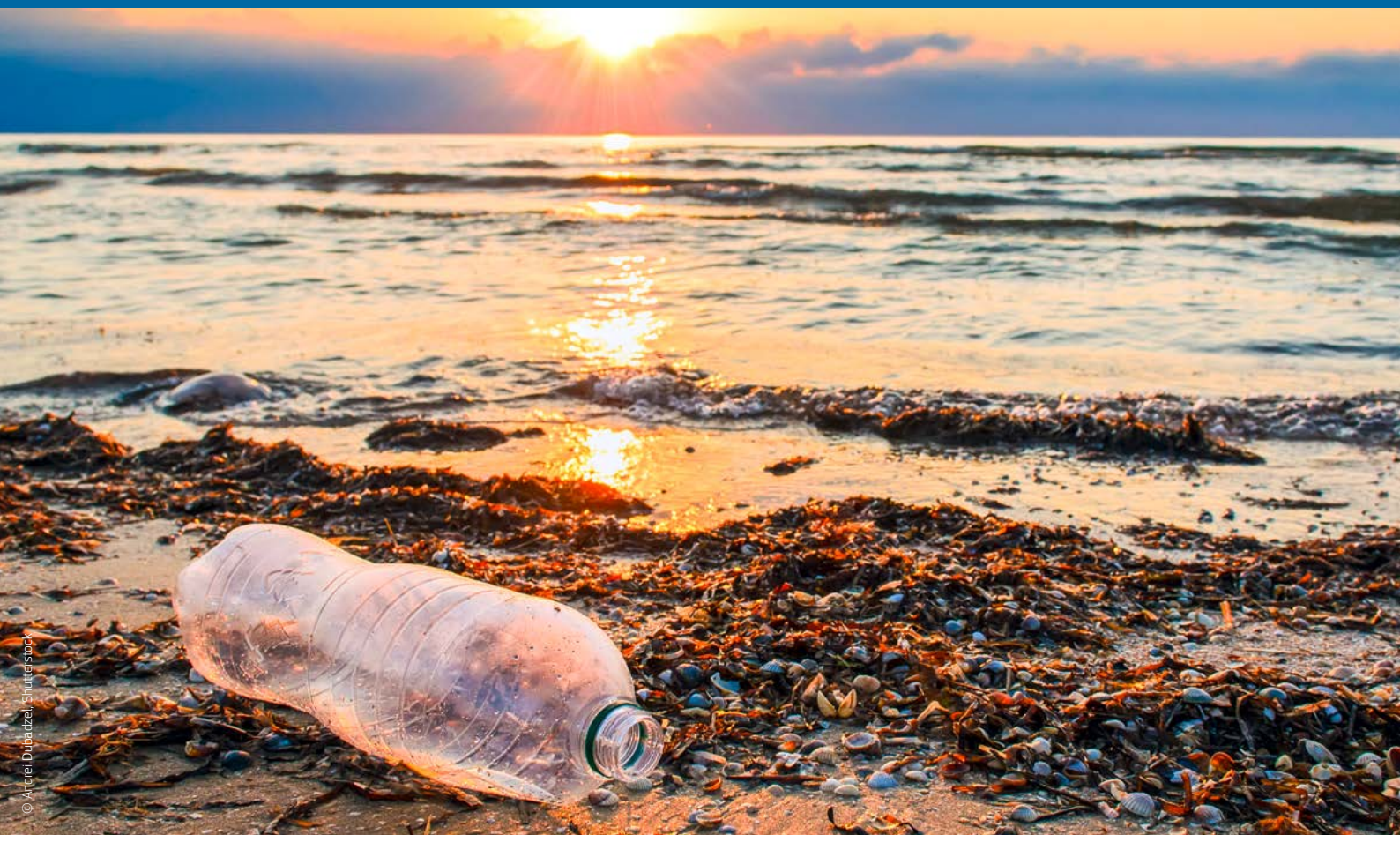
European Commission

Ocean plastics

Sustainable and innovative solutions to tackle the plastics crisis in our oceans and seas



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The prevalence of plastic in our rivers, seas and oceans, has become an incredibly topical issue over the past few years with many raising the alarm about an impending environmental disaster. Yet plastics are a vital material in our modern society and play an important role in our daily lives.

Unfortunately, our oceans and seas are already heavily polluted with plastic, which can be found in even the remotest areas such as the Arctic. Every year, between 4.8 and 12.7 million tonnes of plastic end up in the ocean, posing severe environmental, economic, health and aesthetic problems.

The EU is taking concrete political actions to address this growing environmental crisis. Strong and robust research is required to ensure that policymaking is based on sound scientific evidence and that can point the way on what can be achieved.

This flyer summarises eight EU-funded projects that feature in our CORDIS Results Pack on Ocean Plastics and all of them are working to find new, sustainable and achievable solutions to help us address, and ultimately overcome, this global problem. To access the full Pack, please go to: cordis.europa.eu/article/id/401309

Research and Innovation

ECOLACTIFILM

(A Water-Soluble Packaging to Unlock New Markets), coordinated in France

In the context of growing concern over marine plastic pollution, one major such barrier is the lack of water solubility. The EU-funded ECOLACTIFILM project, undertaken by the innovative French SME Lactips, has created thermoplastic pellets from milk protein that can reach almost 100 % biodegradation in under 28 days. Lactips successfully raised EUR 3.7 million in 2018 for their product, with sales beginning in the final quarter of that year. Lactips has reached an agreement with the German eco-friendly cleaning and care products manufacturer, ULRICH-Natürlich, over a first set of orders. With detergent tablets being the first marketable product released, Lactips is already contemplating new markets, such as construction, dyes, the textile industry, and the agro-chemical and food sectors.

→ lactips.com



© Lactips

EuroMix

Coordinated in the Netherlands

This project has been aiming to establish novel testing and assessment strategies for chemical mixtures found in humans, as well as the relevant tests and models to go alongside them. Various human biomonitoring studies have already proved that people in Europe have a considerable number of man-made chemicals in their bodies. The team delivered a test strategy to generate the missing toxicity data needed to conduct future risk assessments. They tested many chemicals and ran several case studies addressing exposure assessment affecting three adverse outcomes: liver steatosis, skeletal malformation and the endocrine system. Finally, they developed a novel risk modelling approach aligned with future needs in Europe and elsewhere. By the end of the project, the consortium will provide an open, web-based data and model platform.

→ euromixproject.eu



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P4SB

(From Plastic waste to Plastic value using Pseudomonas putida Synthetic Biology), coordinated in Germany

Many believe synthetic biology will be at the heart of the next technological revolution, with one of the key outcomes being a new generation of environment-friendly plastics that would help to stem the current high levels of ocean pollution. The P4SB project has devised a plan resulting in the bioconversion of oil-based plastics into fully biodegradable ones, using deeply engineered, whole-cell bacterial catalysts derived from a bacterium known as *Pseudomonas putida*. P4SB technology is now somewhere between TRL 3 and 5, and after the project's formal end in March 2019, consortium members plan to keep developing their degrading enzymes, with for example potential applications in the textile industry.

→ p4sb.eu



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POSEIDOMM

(Photochemistry at the Ocean's Surface: Effects and Interactions of Dissolved Organic Matter with Microplastics), coordinated in Italy

With plastics production set to double within the next two decades, pollution of the ocean's sea-surface microlayer (SML) can only get worse. Major physical, chemical and biological exchanges take place in the SML and the POSEIDOMM project investigated the effects of microplastics on the SML. It explored their impact on the production of organic matter, the degradation of this organic matter as a potential net source of CO_2 in the atmosphere, as well as other microplastic-induced changes in the molecular composition of the SML. The consortium combined in-lab, controlled experiments (microPOSEIDOMM) on various water samples with a world-first large-scale *in situ* mesocosm experiment focusing on microplastics (mesoPOSEIDOMM).

→ poseidomm.eu



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Respon-SEA-ble

(Sustainable oceans: Our collective responsibility, our common interest. Building on real-life knowledge systems for developing interactive and mutual learning media), coordinated in France

The Respon-SEA-ble project used participatory techniques to develop a range of Ocean Literacy (OL) products and interactive guidance for practitioners, accessible to interested parties including educators, businesses, trainers, policy makers and the media. Respon-SEA-ble focussed on six thematic areas curated as 'key stories' – sustainable fisheries/aquaculture, marine renewable energies, eutrophication, maritime transport, sustainable tourism and microplastics – all contributing to marine ecosystems' health, connecting to existing policies and relevant to actors (e.g. policy makers, producers and consumers) capable of driving change to combat some of the many challenges facing the oceans, including plastics pollution.

→ responseable.eu



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SAILCLEAN

(A complete solution for sea cleaning: Marine litter removal and optimal algal bloom harvesting), coordinated in Iceland

Iceland's Technology Development Fund supported innovative SME Asco Harvester to build a prototype waterborne harvester, and with EU support under the SAILCLEAN project the company has started the design, build and development phase for full-scale cleaning boats. The SAILCLEAN project has tested its solution in the Atlantic Ocean, with promising results. SAILCLEAN conducted a feasibility study into a new boat fleet that could 'mow' toxic algae and marine litter (including plastics), especially in difficult areas such as fjords, open oceans or river canals – as well as sustainably harvest marine resources. The project team are now working to improve the boat design based on the trials and discussions with stakeholders.

→ ascoharvester.is



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UTOFIA

(Underwater Time of Flight Image Acquisition System), coordinated in Norway

Particles suspended in water can result in turbid environments, and being opaque in appearance they impair visibility. The EU-supported UTOFIA project tackled this imaging problem by emitting very short pulses of light, timed to match the shutter of a camera, as opposed to a continuous stream of light (as with the car headlights analogy). The project developed prototypes for a commercial underwater inspection system using 3D 'time-of-flight' technology, of interest for marine science, public sector environmental monitoring, commercial fisheries/aquaculture stock assessment and subsea technologies, such as seabed mapping. Currently the team are working on the commercialisation of the technology through one of the project partners, Subsea Tech, and anticipate making their first sales this year.

→ utofia.eu



© UTOFIA

WasteShark

(Marine Litter Prevention with Autonomous Water Drones), coordinated in the Netherlands

With EU support under the WasteShark project, SME RanMarine has added a new innovation to its suite of marine litter solutions. Their SharkPod allows aquadrones, known as WasteSharks, to autonomously deliver and empty waste, debris or biomass, from ports and inland waters, safely on shore. The WasteSharks have a carrying capacity of 200 litres, with a buoyancy of 400 kg. Self-organising swarms can operate collectively and, using sensors, gather crucial environmental data while collecting garbage. As they are intended for harsh environments, the aquadrones must be robust, and so design was guided by the principle that fewer moving parts equates to fewer repairs and replacements. RanMarine is seeing demand for both units and already shipping globally, and they are now working to fine-tune their products.

→ ranmarine.io



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Learn more about EU policies on combatting Ocean Plastics: ec.europa.eu/info/research-and-innovation/research-area/environment/plastics-circular-economy_en

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