

# CIRCULAR FOODPACK

Key accelerator in the transition of the packaging industry to a circular economy

CIRCULAR FoodPack provides significant advances in food-compliant recycling with high impacts on all stakeholders along the plastics value chain as well as on the society and the environment. In order to achieve the key impacts, the concept and approach are centered on the involvement of all the actors.

The project creates structured knowledge and standardisation by providing technological and product innovations, which will be moved further towards market maturity.

## Key impact and benefits

- ▶ Increased recovery and sorting purity of newly designed and tracer-marked food-grade packaging items
- ▶ Increased recycling of plastics from flexible multi-layered packaging materials
- ▶ Reduced use of virgin plastics and reduced volume sent to landfill and incineration
- ▶ Enabling the circular design of flexible packaging products currently made of multi-layer materials
- ▶ Increased knowledge on the process environmental footprint, including the net effects on greenhouse gas emissions, of improved sorting, separation and recycling of composite and multi-layer materials
- ▶ Support for standardisation in the EU food and packaging industry
- ▶ Contribution to green growth and the transition towards a true circular economy

## Consortium

Led by the Fraunhofer Institute for Process Engineering and Packaging IVV in Freising, the CIRCULAR FoodPack consortium consists of fourteen companies and research institutes from Belgium, France, Germany, Greece, Spain and Switzerland



## Contact

Dr. Esra Küçükpinar

Fraunhofer Institute for  
Process Engineering and  
Packaging IVV

+49 8161 491-507  
esra.kucukpinar@ivv.fraunhofer.de  
www.ivv.fraunhofer.de



[www.circular-foodpack.eu](http://www.circular-foodpack.eu)



@CIRC\_FoodPack



CIRCULAR FoodPack

## Funding programme:

The CIRCULAR FoodPack project receives funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 101003806

## Project duration:

June 2021 – November 2024

## EU funding:

EUR 5.4 million



Horizon 2020  
European Union Funding  
for Research & Innovation



# CIRCULAR PACKAGING

for Direct Food Contact  
Applications

[www.circular-foodpack.eu](http://www.circular-foodpack.eu)

## CIRCULAR USE OF HIGH-QUALITY PLASTICS IN FLEXIBLE PACKAGING INDUSTRY

Flexible plastic packaging is indispensable for food and personal care products because of its excellent ability to meet the manifold requirements for safety and hygiene. Depending on the requirements of the packaged goods, seven or more layers are combined in a single film.

However, such film structures cannot be reliably sorted and efficiently recycled by state of the art processes. With two million tons of multilayer-composites for food packaging annually, the material streams targeted by CIRCULAR FoodPack are significant and accordingly a huge impact within the EU packaging sector is expected.

## CIRCULAR FOODPACK

Innovative technologies for the production of high-quality recyclates

CIRCULAR FoodPack focuses on the production of high-quality recycled polyethylene, using Sensor-Based-Specification (SBS) and Tracer-Based-Sorting (TBS) technologies, deinking and thermally assisted deodorization treatments as well as solvent-based or mechanical recycling processes. Innovative designs of recyclable and food-safe mono-material laminates will enable the re-use in high-value film applications, like food packaging marked with deinkable tracers.

This allows for a future circular economy of food and personal care packaging. A thorough social and environmental impact analysis, as well as a market and consumer needs assessment will accompany the developments to set up a competitive business model.



### Collection & Sorting

- novel photonic and hyper spectral measurement technologies (SBS)
- tracer portfolio for automatic sorting (TBS) of food packaging plastics

### Pre-Treatment

- improved washing process for an effective deinking
- thermal treatment to remove volatiles and odours

### Recycling

- processing cascade combining mechanical and solvent-based recycling (both physical)
- upscaling of developed technologies

### Food safety & Compliance

- challenge tests & migration modelling to assess acceptable level of Intentionally- and Non-Intentionally-Added-Substances

### Design for Circularity

- recyclable packaging material containing recycled polymers
- integrated functional barrier for food compliance

### Demo Packaging for Use-cases

- food packaging
- personal care
- home care packaging

### LCSA & Business modelling

- Life Cycle Sustainability Assessment (LCSA) including environmental, economic and social impacts
- stakeholder-driven business models
- strategies for market entry

## CIRCULAR FOODPACK AN EFFECTIVE RECYCLING PROCESS CASCADE



### Tracer-Based-Sorting

Tracer-Based-Sorting identifies packaging waste items containing unique printed tracers that emit an unambiguous signal when passing through laser light. This is how a material-specific code is generated and allows for efficient sorting systems to separate non-food and food packaging waste for the first time.



### Optimised recycling process

The purification of recyclates will be achieved through optimised recycling process cascades that enable a reduction of contaminants, colour and smell. A promising deinking technology that removes all types of inks and a deodorisation process will be implemented in the mechanical treatment of the flakes. These pre-cleaned flakes are then subjected to physical solvent-based recycling through the patented CreaSolv® Process for separation of the different material components.



### Packaging design for circularity

The project aims at developing recyclable packaging with at least 50% post-consumer recyclates incorporated behind a functional barrier. This ensures that migration of any contaminant will remain below the levels of concern during the lifetime of the packaged good. The CIRCULAR FoodPack technologies will be demonstrated in three use-cases.