

# Interreg



CENTRAL EUROPE

European Union  
European Regional  
Development Fund

**BIOCOMPACT-CE**

DEVELOPING AND STRENGTHENING CROSS-SECTORAL LINKAGES  
AMONG ACTORS IN SUSTAINABLE BIOCOMPOSITE PACKAGING INNOVATION  
SYSTEMS IN A CENTRAL EUROPEAN CIRCULAR ECONOMY





*"Progress is impossible without change, and those who cannot change their minds cannot change anything"*

George Bernard Shaw



# Introduction

Paper and cardboard represented 41% of packaging waste generated by weight in the EU-28 in 2016 (about 35.4 million tonnes). Plastic packaging material reached 16.3 million tonnes in 2016 as the second most significant material (Source: EUROSTAT). The appearance of microplastics in recycled paper secondary materials and compost is becoming a major concern.

There is a high potential for mobilizing synergies between business and research in the area of combined paper-bioplastics packaging design, production and recycling in Central Europe.

Linkages are not sufficiently established due to lack of awareness among paper packaging producers on new bioplastics materials, a separated focus on plastics and paper in clusters and branch organizations, the lack of a common innovation strategy within a clear European and national legal and economic context and the lack of dedicated tools to support SME's in introducing new paper-plastics packaging solutions.

Development of sustainable packaging solutions is one of the most important challenges for the European society. Packaging has an important although often invisible role and is a significant factor in a number of issues that have become leading principles of modern development of dedicated tools to support SME's in introducing new paper-plastics packaging solution: resource efficiency, safety, economic development, environmental burdens. At the same time packaging is strongly connected to society at large. It touches the existence of every individual in meeting consumers' demands with respect to functionalities, new life styles and trends and it is constantly exposed to public scrutiny.

With the intensified focus on recycling and plastics, products made from a combination of materials, especially if one is plastic, are also undergoing more scrutiny. Among these, especially combinations of paper and plastic, due to their wide use, are an attractive target since the impact of their improvement can be significant.

The recycling targets, which are being regularly raised for most packaging materials, give even more relevance to proper end-of -life options. Furthermore, environmental, social and economic challenges focus on the need for a sustainability transition towards a circular bio-based economy. In this context, paper and bioplastic packaging products may play a strategic role.



# Who we are



**ECOCORTEC** specializes in developing and manufacturing value-added biodegradable/compostable flexible films that outperform non-degradable and other biodegradable materials currently on the market.

We strive to develop eco-efficient production of biodegradable films that combines new technology and high productivity with positive effect on environment.

[www.ecocortec.hr](http://www.ecocortec.hr)



**FONDAZIONE LEGAMBIENTE INNOVAZIONE (FLI)** is part of Legambiente, the most widespread environmental association in Italy. FLI promotes innovation in the environmental field and diffusion of environmentally friendly goods, services and technologies.

Areas of activity: policy improvement in cooperation with public and private stakeholders, sustainable mobility, waste management, business innovation, green economy.

[www.legambiente.it](http://www.legambiente.it)



**INNOVHUB SSI** is a multi-sector public research centre supporting research and business innovation in several industrial fields. The Paper Division services cover the entire paper based products value chain from raw material to converting operations.

Key competences are in paper production process and testing, bio-based packaging, sustainability, food contact, paper recyclability, full biodegradability and compostability tests according to international standards.

[www.innovhub-ssi.it](http://www.innovhub-ssi.it)



**ŁUKASIEWICZ – COBRO – PACKAGING RESEARCH INSTITUTE** is a research institute with experience in testing of primary, secondary and (transport) packaging, taking into account its eco-design, full value chain and life cycle. COBRO provides high-tech test laboratories as well as the equipment for pilot production of packaging and packaging materials. COBRO is a member of IAPRI, WPO, European Bioplastics, and Polish Chamber of Packaging.

[www.cobro.org.pl](http://www.cobro.org.pl)



**NATIONAL INSTITUTE OF CHEMISTRY** is a leading Slovenian public research institution in the field of chemistry and related disciplines. Research at the Institute is oriented towards the development of new knowledge, technologies and products.

The Department for Polymer Chemistry and Technology is focused on sustainable polymers, polymers with special functionalities and polymer characterization.

[www.ki.si](http://www.ki.si)





**OMNIPACK** First Hungarian Packaging Technology Cluster is a business building community, intended to maintain cooperation among its 29 members and create economic advantages. The SMEs, research organization and ecosystem actors of Omnipack comprise a total of 35 million EUR of market coverage, of which 35% is export.

[www.omnipack.hu](http://www.omnipack.hu)



**PAPIROL** is located in the northeastern part of Slovenia. It is a modern-oriented manufacturing company with a 30-year tradition, introducing the concept of manufacturing and selling paper bags, wrapping, baking, arranging and some other types of paper and cellophane.

[www.papirol.si](http://www.papirol.si)



**POLISH CHAMBER OF PACKAGING RECYCLE AND RECOVERY (PIOIRO)** is a local government economic association of enterprises connected with the entire life cycle of packaging. PIOIRO supports development of entrepreneurship in packaging and packaging waste industries, promotes innovations via creating effective environmental, legislative and economic conditions and building a recycling systems for multi-material packaging and hazardous substances

[www.pioiro.pl](http://www.pioiro.pl)



**RERA S.D.** is a regional development agency established by Split Dalmatia County (regional self-government body). Core activities refer to preparation and implementation of EU projects. The agency runs activities connected to support for the SMEs in different fields providing them support in developing business plans, providing them education and information and connecting SME sector to R&D institutions.

[www.rera.hr](http://www.rera.hr)



**SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA** is a modern educational and scientific institution. The University created the Centre of Applied Research of Environmentally Sustainable Polymer Materials in Nitra (CEPOMA) for the research in the field of biodegradable polymers. The Centre is oriented to the verification of technologies of original biodegradable materials for different applications.

[www.stuba.sk](http://www.stuba.sk)



# Where we are



TAKING  
**COOPERATION**  
FORWARD



# Challenges

## CHALLENGES

01

Faster development of innovative paper, bioplastics and paper/bioplastic multi-materials to replace plastic packaging

02

Acceleration of all bio-based plastics development to reduce costs of sustainable products

03

Separation of conventional plastics from bio-based biodegradable plastic waste with high efficiency to lower the impact during organic recycling

04

Recycling of bio-based paper/bioplastic multi-materials in paper mills as much as possible to recover fibres



# Our vision

## Packaging contributes to

**food safety** providing a barrier to external physical agents and microbial contamination.

Very importantly, it increases the shelf life of packaged foods thus reducing food waste.

Nonetheless, due to its large use and often very short life cycle it brings a significant environmental burden.

## Material combinations (like paper and plastics)

in packaging add value, functionality and improve critical properties (e.g. barrier properties). On the other hand, it may provide a substantial barrier to optimal recovery options like reuse and recycling.

## Sustainability of combined materials

use strongly depends on real, not potential, waste management practices and available infrastructure. However, recycling infrastructures shall develop in order to meet the complexity of new packaging multi-materials.

## Multi-material recycling is the preferred waste treatment option,

before organic recycling (aerobic treatment - industrial composting or anaerobic treatment - biogasification) due to material preservation.

In principle, the following general approach may be suggested to ensure a limited impact on recycling operations

- Non-food packaging and dry food packaging shall be recycled, preferentially in the paper stream if not separate streams
- Wet food packaging in contact with wet or greasy food shall be organically recycled – composted in aerobic or anaerobic conditions

### **Acceptable material combinations** must be

- Easy to separate
- Recyclable by existing and available technology intended for a common material stream

**The best ecological solution** in paper/plastics composites is offered by materials produced from renewable raw materials (bio-based). Following this principle that should reduce the carbon footprint in the production stage. Since bio-based plastics can be either biodegradable or non-biodegradable the end-of-life impact is addressable through two options:

- paper/biodegradable plastics combinations that are fully biodegradable and compostable
- paper/not-biodegradable bioplastic may be recycled separately or in specialised paper recycling mills.

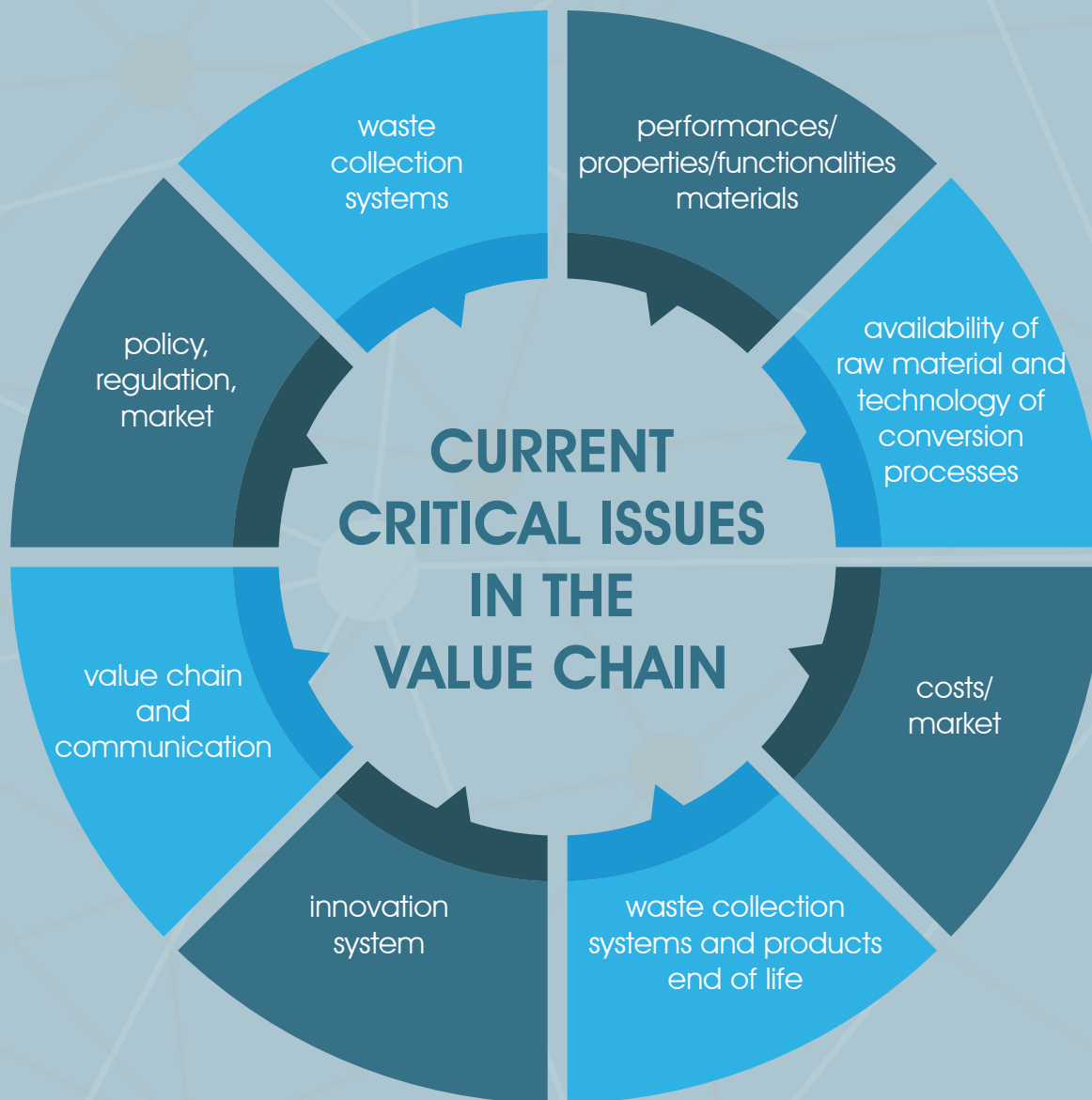
### **Combined materials and products**

thereof have a real potential to be an integral part of both circular resource use and the bio-economy providing that

- Systemic policy measures will greatly support a widespread application of sustainable combined materials
- Ecodesign and considerations of real end-of-life options are taken as a prerequisite for efficient combined materials products
- Effective technical standard for eco-design and multi-material recycling as well as the development of advanced recycling infrastructures in CE will be encouraged and implemented



# Issues







# Pilot actions

The project foresees 3 pilot actions involving 21 companies. The first pilot action will focus on 3 companies in the partnership. The second one on 18 companies in 6 countries and the third on 6 companies involved in the previous 2 actions.

## PARTNERSHIP COMPANIES

### PANARA (Slovakia)

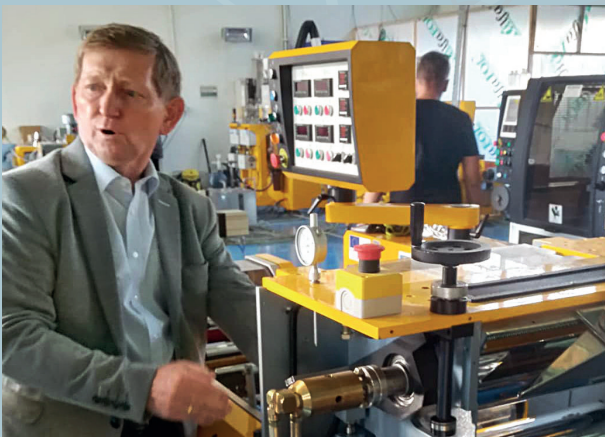
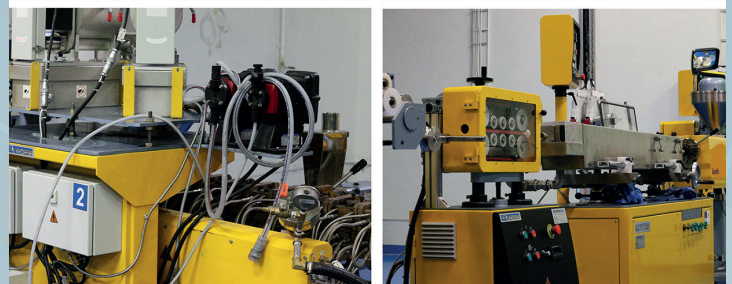
FOUNDATION: since 2006 with R&D

SIZE: small-sized

KEY PRODUCTS/ SERVICES: producing biodegradable plastics, NONOILEN 1st and 2nd generation, services for plastic items producers, R&D

KEY MATERIALS: PLA, PHB, Starch, Additives

PRODUCTION OF BIOCOMPOSITE: external





## POL-ZDOB DRUKARNIA (Poland)

FOUNDATION: 1990

SIZE: medium

KEY PRODUCTS/ SERVICES: flexographic over-prints on paper-based and foil surfaces, over-prints in HIGH DEFINITION FLEXO technology, FLEXO technology printing with low-migration UV inks and solvent inks

KEY MATERIALS: virgin paper, coated paper, conventional plastics, biodegradable and biobased plastics

INVESTMENT: more than 50% of the annual budget

EXPORT: 20%

PRODUCTION OF BIOCOMPOSITE: internal





## ECOCORTEC (Croatia)

FOUNDATION: 2007

SIZE: small-sized

KEY PRODUCTS/ SERVICES: biodegradable/  
compostable flexible films, bags

KEY MATERIALS: biodegradable materials

INVESTMENT: budget was between 0% and  
10% in the last 3 years

EXPORT: 80% - 100%

PRODUCTION OF BIOCOMPOSITE: internal





## PAPIROL (Slovenia)

FOUNDATION: more than 30 years ago

SIZE: small-sized

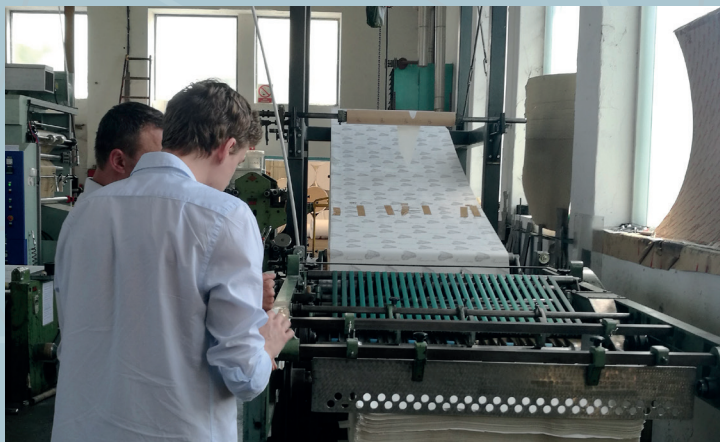
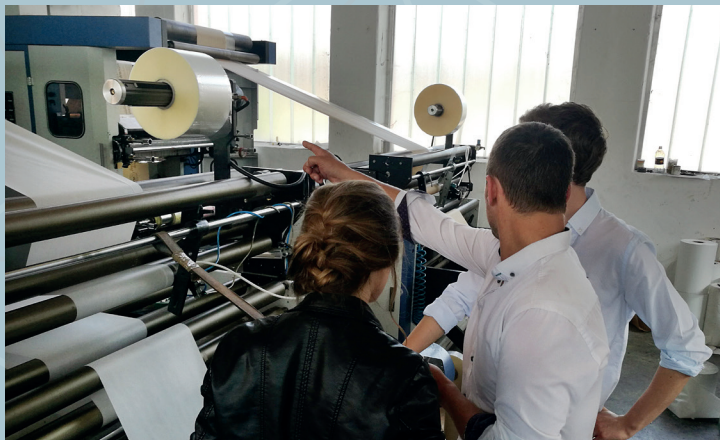
KEY PRODUCTS/ SERVICES: producing paper products with a tradition of 30 years, bags, wrapping paper, baking paper, packaging end use product (food, nonfood, primary, secondary), single use products

KEY MATERIALS: virgin paper, mix, recycled/virgin paper, type of coated paper.

INVESTMENT: budget was between 0% and 10% in the last 3 years

EXPORT: 40% - 60%

PRODUCTION OF BIOCOMPOSITE: external





## UGRINPACK (Hungary)

FOUNDATION: 1991

SIZE: small sized company

KEY PRODUCTS/ SERVICES: production of flexible-walled packaging materials, packaging of promotional products, production of POS products, packaging of blister products

KEY MATERIALS: flexible-walled packaging materials, rigid packaging materials, blister, POS

INVESTMENT: between 0% and 10% in the last 3 years.

EXPORT: export share is between 0% and 20%.

PRODUCTION OF BIOCOMPOSITE: external



## PLASTIGRAF TREVIGIANA (Italy)

FOUNDATION: 1980

SIZE: small sized company

CERTIFICATIONS: BRCGS PACKAGING – FSC ®

KEY PRODUCTS/ SERVICES: lamination of paper (sheets or bopps) and cardboard with plastic and bioplastic film for multi-material multi-layer products

KEY MATERIALS: virgin paper, recycled paper, PET, PE, PP, Bioplastics (PLA)

APPLICATIONS: food contact, luxury, editing, shopping bags

EXPORT: export share is between 0% and 20%.

PRODUCTION OF BIOCOMPOSITE: internal







# Transnational Biocomposite Packaging Centre

Transnational Biocomposite Packaging Centre (TBPC) is a virtual network platform of technology and business innovation service providers in the area of sustainable paper-plastics packaging solutions.

The platform will provide scientific, technical, technology as well as economic feasibility assessment, promotion and other supporting types of expertise to offer a well rounded, one-stop support service.

## Target

- Sectoral agencies
- Higher education and research
- SME
- Business support organisation

## Our Features

It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout.



### About US

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### Biocompack-ce

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