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 **A Suitable strategy for paper/bioplastic packaging end of life is needed to avoid constrains in products'end of life**

 **Convegno BIOCOMPACK-CE, ECOMONDO, Rimini 5th October 2019**

EU PLASTIC STRATEGY AND SINGLE USE PLASTIC DIRECTIVE (EU 2019/904)

- High impact on media

- High demand for faster replacement of conventional plastic
 - New packaging solutions*
 - Increased use of paper packaging*
 - Increased use of bioplastics in multi-material paper based products*



EN 13430 Material recycling

EN 13432 Organic recycling-composting



→ *high request in the market of biodegradable & compostable products*

→ *Senseless products try to achieve compostability certification*

→ *Easy recycling paper products are diverting from the paper circular economy loop for “only for market reasons”*

→ **SUSTAINABILITY AND CIRCULAR ECONOMY SHOULD BE THE DRIVING FACTOR**



PACKAGING MARKET

- **Plastic and paper have the highest share in global market**
 - *Plastic more represented in food contact packaging*
 - *Paper more represented non-food contact packaging*

Figure E.1 Global plastic packaging market, 2015 (\$ million)

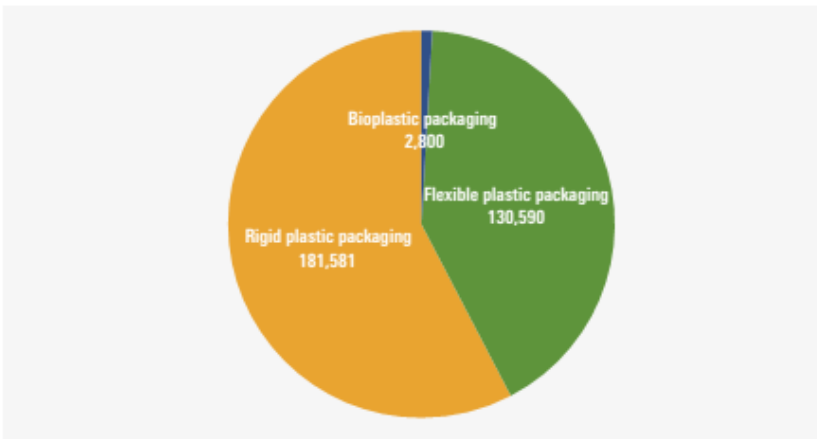
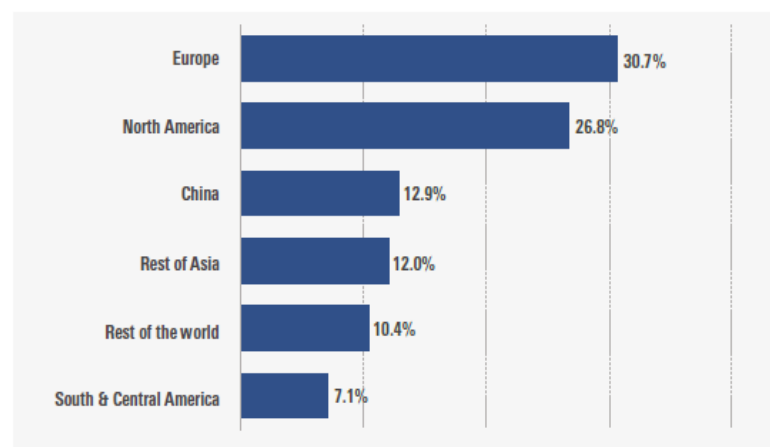


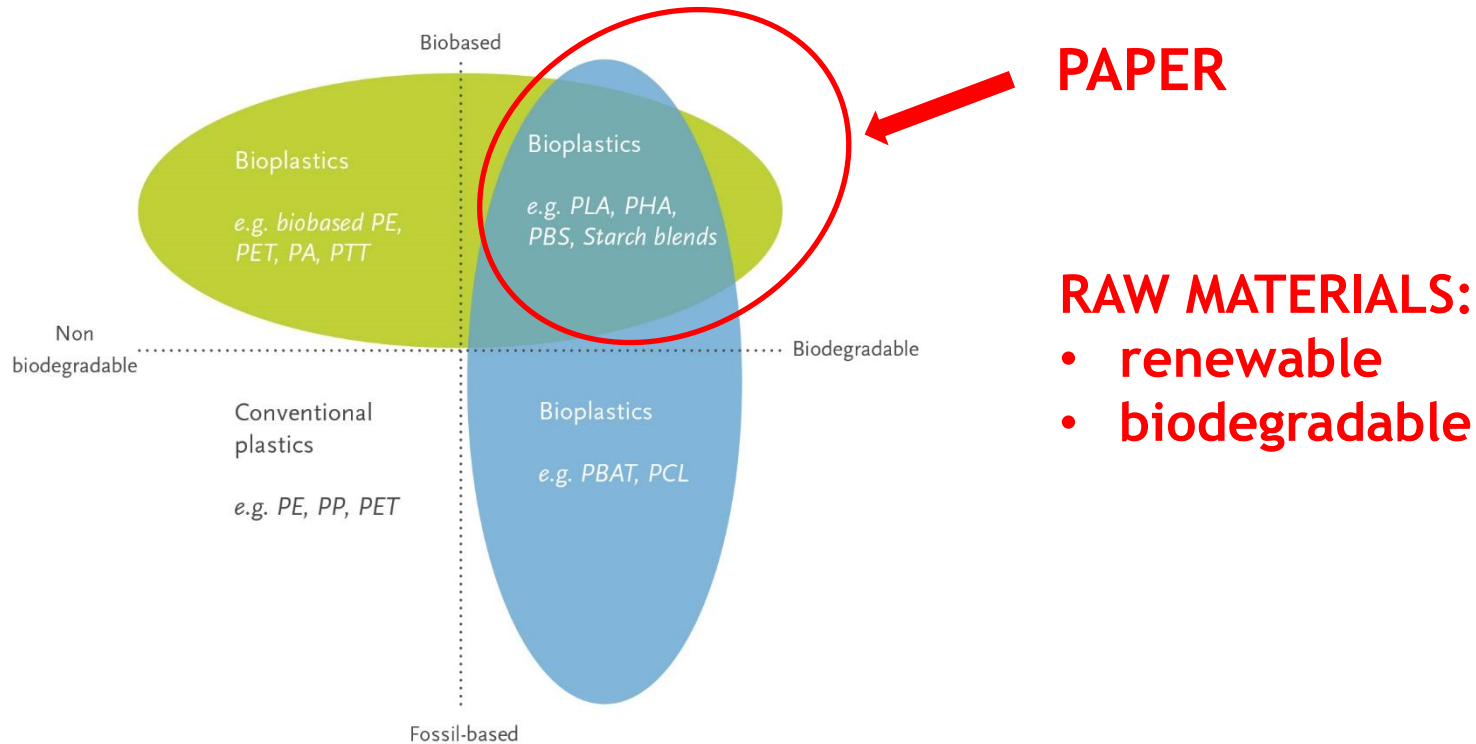
Figure E.2 Global bioplastics for packaging consumption, percentage share by region, 2016



Source: Smithers Pira report, *The Future of Bioplastics for Packaging to 2022*



PAPER/BIOPLASTIC COMMON FEATURES



Source: <http://www.european-bioplastics.org>

- Increase the share of renewable materials
- Increase recycling options (composting)



- Paper is seen as the most eco-friendly alternative.
- Use of multi-material products is often seen as problematic due to difficulty in recycling

More Complex paper based packaging is often needed due to greater consumers' demand on functionality and safety of the products

- **Barrier properties (water/grease proof)**
- **Products shelf life**
- **Food waste reduction**



Increase use of paper/bioplastic multi-materials would greatly help to reduce amount of conventional plastic in some packaging application:

- Multi-material paper based packaging is by large majority **MADE OF PAPER**
 - COMMON COMPOSITIONS: 95/5.....85/15.....70/30

WHAT ARE THE END-OF-LIFE OPTIONS



- ❑ **Multi-materials made of paper and NON biodegradable bioplastic** (e.g. Bio-PE) may be recycled as material in the paper stream
- ❑ **Multi-materials made of paper and biodegradable bioplastic** (PLA, TPS, Cellulose acetate) may be recycled as material in the paper stream OR through organic recycling in composting plants



Paper recycling process

- ✓ *increase of waste rejects*
- ✓ *Adhesive substances not compatible with recycling process*

Industrial composting

- ✓ *Increase rejects (dragging effect of conventional plastic)*
- ✓ *Increase of non biodegradable or eco-toxic substances*



CERTIFICATION SCHEMES

- ✓ Clear identification in B2B relationship
- ✓ Guarantee of acceptability in material collection
- ✓ Help consumers' recognition

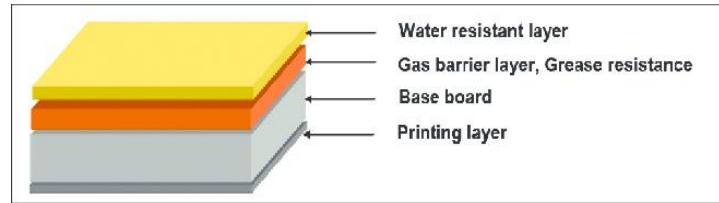
COMPOSTABILITY- EN 13432



UNI 11473- PAPER RECYCLING STANDARD METHOD EVALUATION SYSTEM ATICELCA 501:19



RECYCLABILITY OF PAPER BASED MULTI-MATERIALS



Standard recycling mills

- as function of product design
- Mills can stand only up to a certain amount of multi-materials

Specialized paper recycling mills

- Higher efficiency
- Waste rejects maybe further recycled



END OF LIFE STRATEGY FOR PAPER/BIOPLASTIC PACKAGING PRODUCTS



Material recycling OR organic recycling ?

Material recycling shall be the priority for:

- Non food packaging
- Food contact packaging in contact with dry foodstuff



ORGANIC RECYCLING OF MULTIMATERIALS BASED ON PAPER/BIOPLASTIC



• Packaging in contact with moist and grease foodstuff (*not easy to clean*)

- soft cheese, fresh cuts ham/meat/fish
- ready to eat greasy food (lasagne etc.)



• In closed community loops

- school or company catering
- Large shopping centres
- airports/flights



- likely the presence of residual food
- guarantee use of certified products
- proper collection and treatment (agreement with composting plants)



Material combinations (like paper and bioplastics) in packaging add value, functionality improve critical properties.

-It represents a better ecological solutions in comparison to conventional plastic.

Sustainability of combined materials strongly depends on real waste management practices and available infrastructure.

HOWEVER



- recycling infrastructure shall develop in order to meet the complexity of new packaging multi-materials.



MATERIAL RECYCLABILITY

CHALLENGES AND PRIORITY ACTIONS

Paper/bioplastics multi-materials products

CHALLENGES

-shall be recycled in paper mills as much as possible to recover fibres in the paper loop.

ACTIONS

- Promote recyclability standardization for multi-materials to limit recycling constrains
- Promote scientifically based eco-design
- Promote development of suitable infrastructures (collection and advanced specialized recycling mills)



ORGANIC RECYCLABILITY

CHALLENGES AND ACTIONS

CHALLENGES

Avoid dragging effect of conventional plastics in composting plants

Composting infrastructures for biodegradable bioplastics must be readily available in CE

ACTIONS

- Labelling systems have to be improved and harmonized
- Development of innovative identification systems
- Collection and sorting of organic must be enhanced



- ✓ Spread Knowledge and awareness about sustainable production within supply chain and consumers.
 - ✓ Promote of multi-material packaging eco-design (better suited for recycling or composting)
 - ✓ Support voluntary change in packaging design based on CSR
- ✓ Support adoption of life-cycle methodologies including end of life options among decision makers in public bodies and private companies

Multi-materials maybe an acceptable option if properly design





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Grazie per l'attenzione !

Graziano Elegir

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