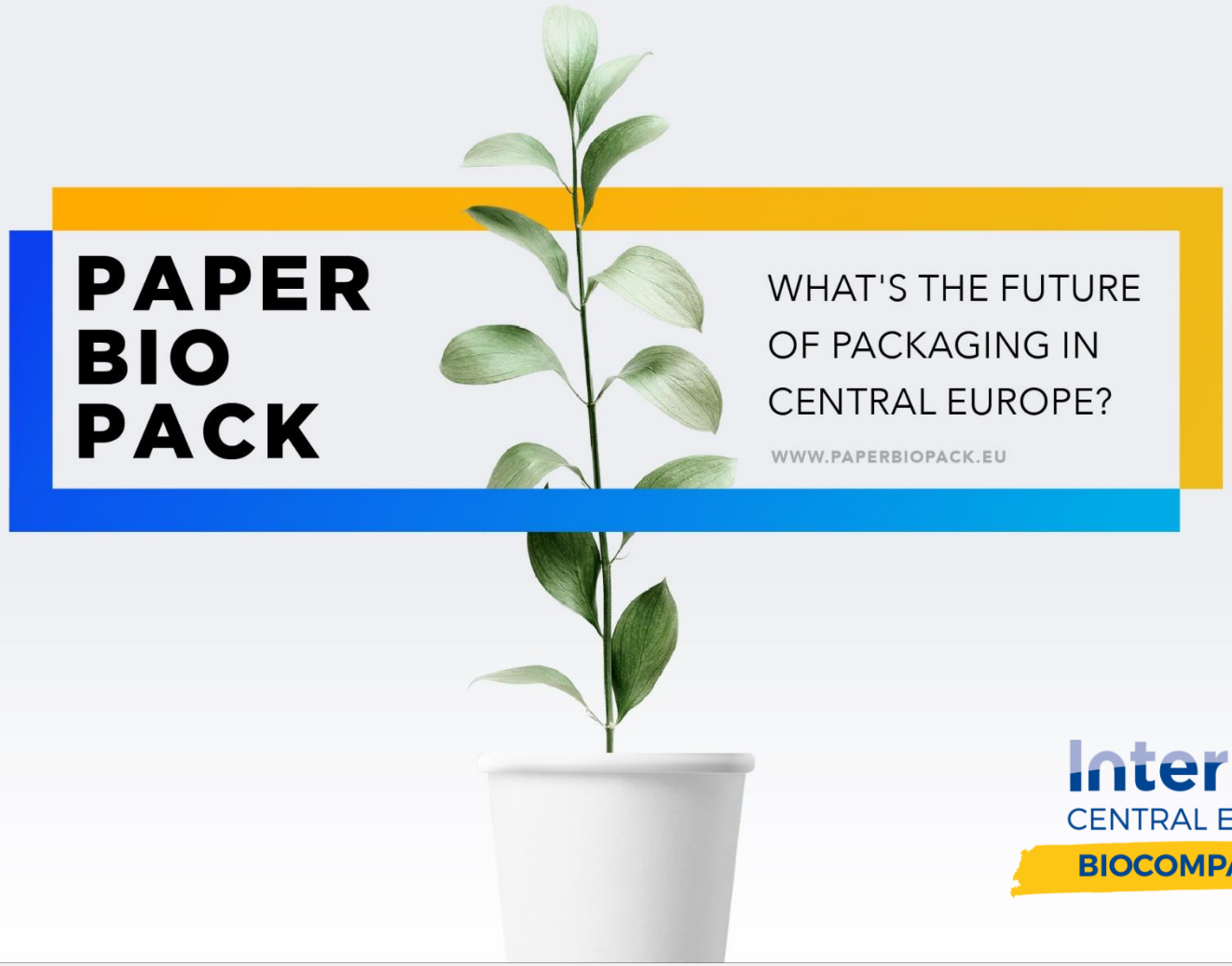

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Training Package - STRATEGY

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Part 1

About Strategy

About Strategy

- options for the development of sustainable paper-plastic, combined packaging in Central Europe,
- defines strategic steps needed to move to a desired outcome in which packaging will better adhere to principles of sustainability and circular resource management,
- a possible view on how positive change in mutimaterial packaging could be achieved within the given conditions.

Part 2

Background context

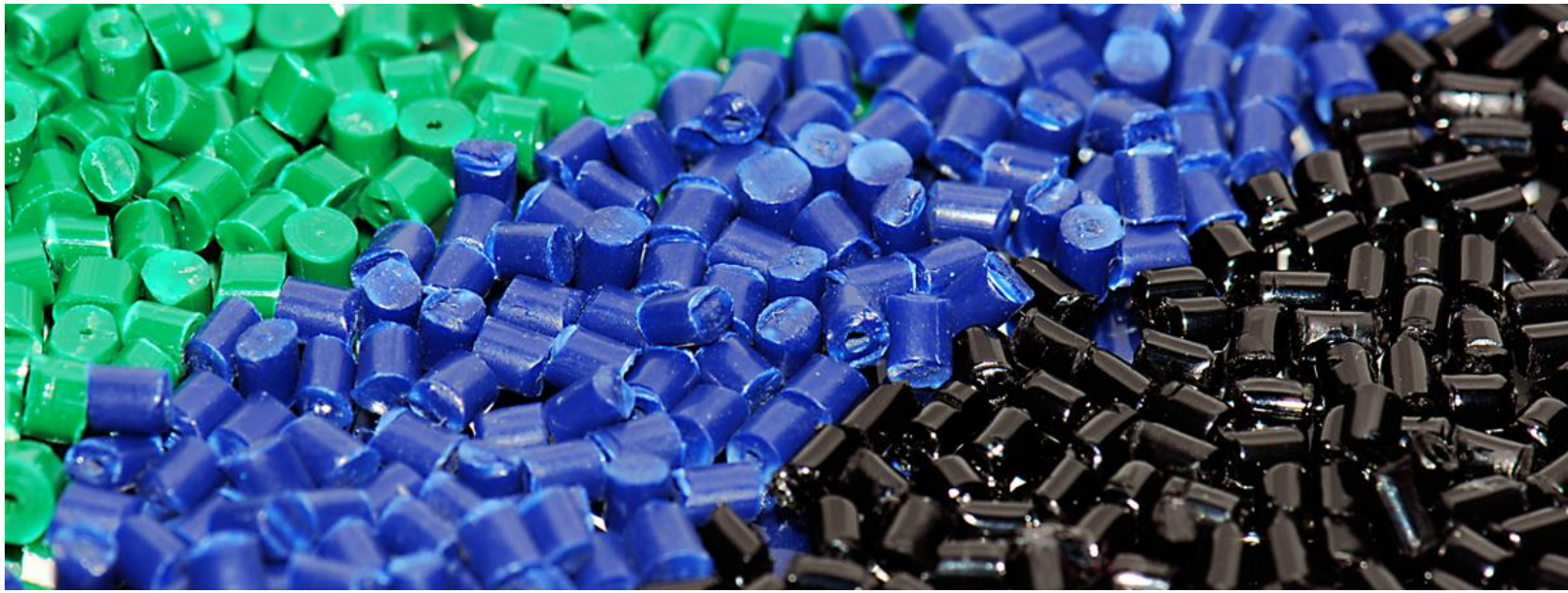
Background context

- Resource efficiency
- Safety
- Economic development
- Environmental burdens
- Legislative and strategic attention
- Combinations of paper and plastic
- Paper and bioplastic packaging
- Policy
- Public opinion !

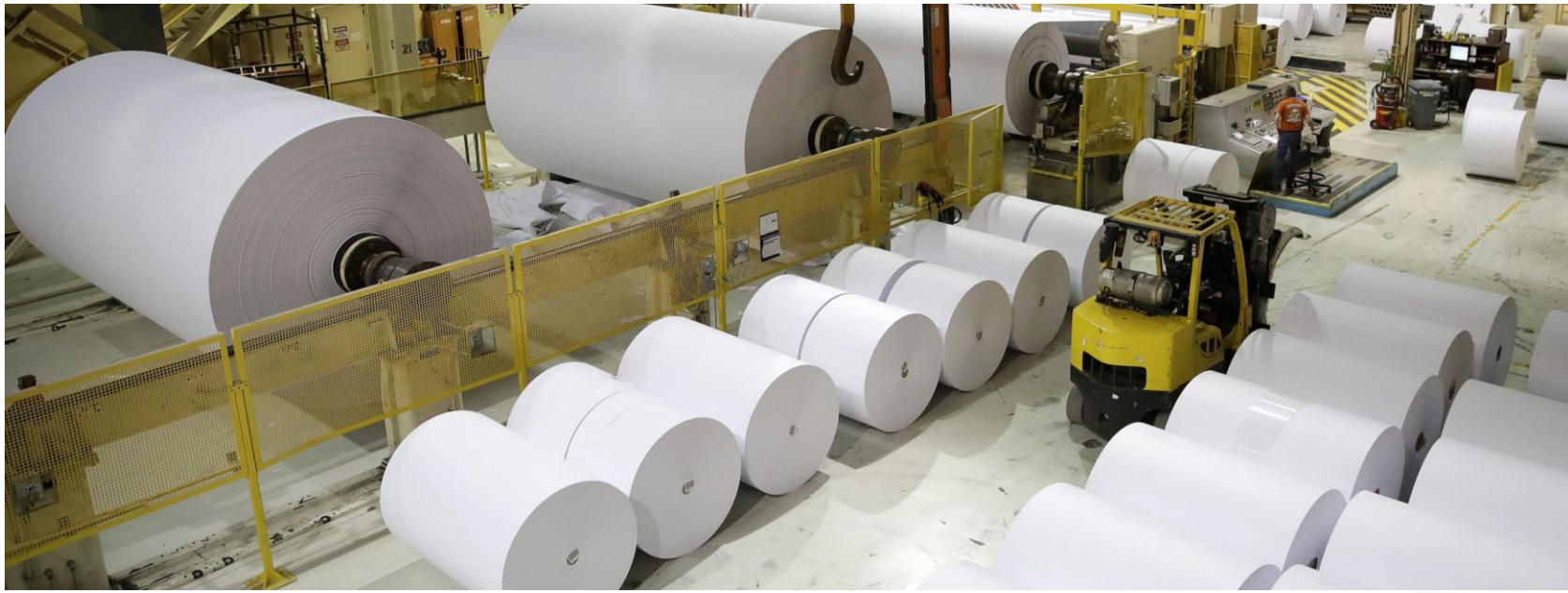
Part 3

Situation

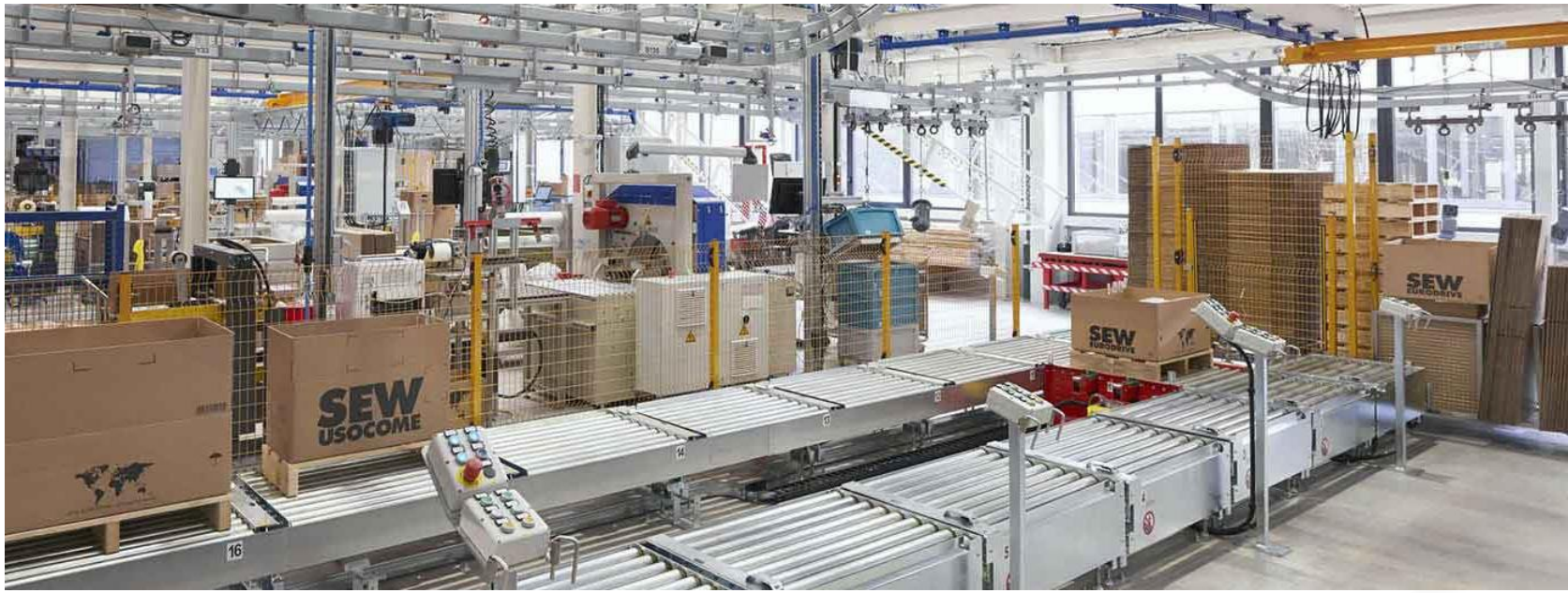
Plastics sector



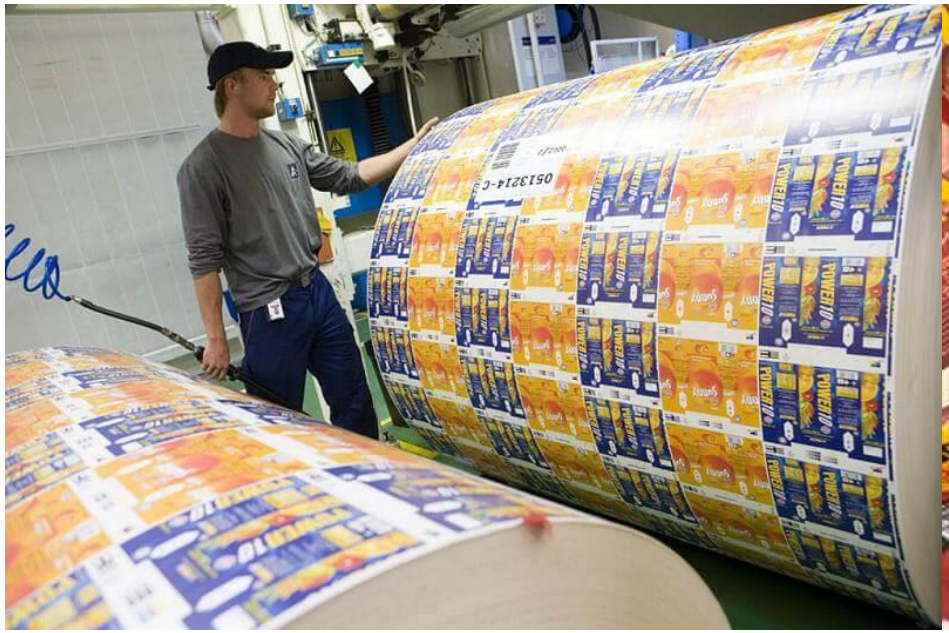
Paper industry

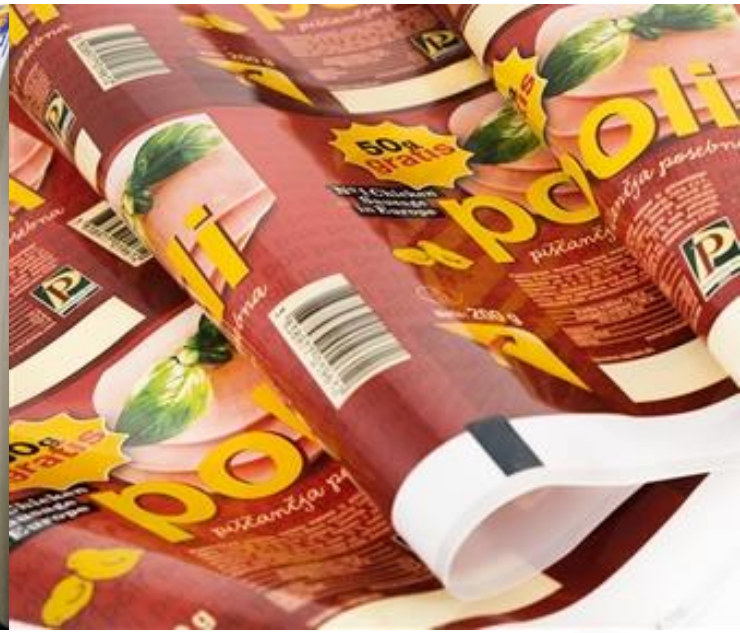


Converting and packaging sector

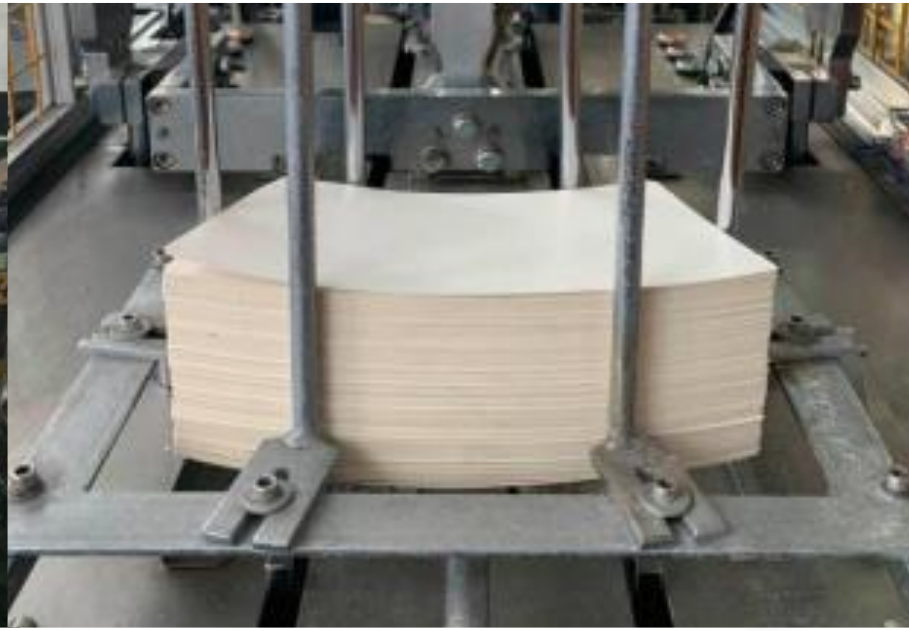


Flexible packaging





Biocomposites



Part 4

Basic challenges

STRATEGY – Basic challenges

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

2. Acceleration of bio-based plastics development and applications is necessary to reduce costs of sustainable products.

3. Conventional plastics have to be separated from biodegradable plastic waste with high efficiency to lower the impact during (organic) recycling.

4. Paper/bioplastic multi-material products shall be recycled in paper mills as much as possible to recover fibres.

5. Paper/biodegradable-plastic multi-material products that cannot be recycled should undergo biological waste treatment.

Part 5

Current critical issues in the value chain

Challenges exist through the entire value chain

- Production (material, product)
- Market
- Use
- Waste management

All based on environmental and economic advantages!

Performances/properties/functionalities of materials

- properties of biodegradable bioplastic and biopolymers are not yet fully comparable to oil-based material,
- Bioplastics not commoditized /information less available
- mechanical and/or functional properties of the bio-based packaging products shall be further developed.

Availability of raw material and technology of conversion processes

- available at higher costs than equivalent fossil-based plastics
- few biodegradable biopolymers are available at a commercial scale (TPS, PLA, PHA),
- still not many companies with a know how and practice of processing paper and bioplastics in composites.

Costs/market

- generally still much higher than conventional plastics,
- the use of bioplastics in combination with paper to achieve greater functionalities (barrier, transparency) leads to increased costs in comparison to mono-materials,
- present small niche market does not allow sufficient returns.

- Needed focus on user demand

Waste collection systems and products end of life

- not optimised for multi-material packaging,
- presence of specialised paper recycling mills is scattered or not present at all,
- composting infrastructures are not yet widely spread,
- organic waste is still highly contaminated with plastics,
- compostable packaging is not easily distinguishable,
- fast development of integrated anaerobic and aerobic digestion industrial plants poses additional constrains to the acceptance.

Innovation system

- improve production processes of raw materials and additives,
- innovation in transformation-converting technologies,
- supporting innovation in SMEs intended to create new services and products,
- set-up of co-innovation partnerships alongside existing and new value chains.

Value chain and communication

- spread awareness about sustainable production of bio-based products,
- enhance the clarity, accessibility and harmonization of sustainability certifications and standards,
- expanding the adoption of life-cycle methodologies (LCA, LCC, S-LCA),
- improve mechanisms to identify and promote case studies and best practice exchange,
- encourage market pull for biocomposite products.

Policy, regulation, market

- integrating approaches,
- perform scenario analysis at regional level,
- public procurement regulation, developing tools, increased awareness and incentives,
- create a new cross-sectorial interconnection,
- promote current applications of paper/bioplastics products,
- open new markets for new applications,
- support creation of knowledge centres,
- support new companies accompanying converters to develop and integrate bioplastics/biomaterials.

Waste collection systems

- promote material recycling of paper/bioplastic products,
- develop suitable locally based collection systems,
- develop low cost composting infrastructures,
- avoid dragging effect through clear labelling and consumers' education.

Part 6

Our vision

Packaging contributes to food safety

- a barrier to external physical agents and microbial contamination,
- increases the shelf life of packaged foods thus reducing food waste,
- due to its large use and often very short life cycle it brings a significant environmental burden.

Material combinations

(like paper and plastics)

- adds value, functionality and improve critical properties,
- it may provide a substantial barrier to optimal recovery like reuse and recycling.

Acceptable material combinations

- easy to separate,
- recyclable by existing and available technology intended for a common material stream.

Sustainability of combined materials

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

The best ecological solution

- produced from renewable raw materials (bio-based),
- should reduce the carbon footprint in the production stage,
- bio-based plastics can be biodegradable or non-biodegradable:
  - paper/biodegradable plastics combinations that are fully biodegradable and compostable,
  - paper/not-biodegradable bioplastic may be recycled separately or in specialised paper recycling mills.

Multi-material recycling is the preferred waste treatment option

- before organic recycling due to material preservation,
- 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,
    - wet food packaging in contact with wet or greasy food shall be organically recycled.

Combined materials and products

A real potential to be an integral part of both circular resource use and the bioeconomy providing:

- 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,
- effective technical standard for ecodesign and multi-material recycling as well as the development of advanced recycling infrastructures in CE will be encouraged and implemented.

Part 7

Desired future outcomes

General goals

- Economic activity
- Jobs creation
- Strengthening regional innovation
- Exports
- Higher added value products
- Regional value chains
- Recognition of region
- Improved utilization of local renewable resources
- Contribution to circular and bio economy
- Contribution to global sustainable development goals

Specific long-term goals

- industrial leadership in biocomposite products,
- new generation of biocomposite packaging materials,
- innovative production technologies,
- full range of materials with different end-of life options,
- greater alliance of entire bio-based industry supply chain,
- separated waste collection, material sorting,
- increase of capacity and technologies of paper recycling mills,
- development of bio-additives and bio-coatings,
- policy development and implementation,
- greater environmental awareness, social costs and Corporate Social Responsibility, green public procurement,
- incorporation of information technologies in collection sorting and waste management.

Specific mid-term goals actions and supporting measures

- Greater integration and cooperation between paper and bioplastic
- Improved technical communication among stakeholders of paper-bioplastics value chain
- Increased the level of education and communication with final consumers
- Create new market opportunities based on social responsibility
- Ambitious regulative measures with promoting
- Develop local infrastructure

Part 8

Implementation scenarios

Implementation scenarios

The listed goals can be achieved through a number of measures.

In principle, two main scenarios can be distinguished:

1. Scenario 1 in which development is supported through strong official innovation and sustainability policy.
2. Scenario 2 that relies on “soft” non policy measures.

Scenario 1

Relies on policymakers at local, national, regional and European levels to continue and deepen in very specific ways the current support for innovation, circular economy, bioeconomy and sustainable development goals.

There are several regulatory approaches that could be taken:

1. Prohibiting combined packaging (vs. monomaterial packaging) on the basis that it limits recycling taking into account available recycling technology.
2. Mandating that paper/plastic composites are designed to standards that support:
    1. easy paper (and plastic) recycling or
    2. composting (alternatively aerobic biogasification).

In order to reach regulatory change:

1. Public pressure and support for change
2. Awareness of the issue
3. Sufficient information that supports the need for change
4. Existing solutions that can realistically be applied

These conditions are most reliable on media, NGOs, science/research, industry (offering workable solutions).

Scenario 2

Relies on a voluntary change in packaging design.

The change can be initiated by different stakeholders in the value chain:

1. packaging waste management companies,
2. retailers, especially large with significant market shares,
3. local government that regulates public systems such as municipal markets or publicly owned businesses,
4. companies, selling to the public as well as NGOs and similar,
5. producers of packaging.

Specific measures to reach packaging change

1. Providing accurate and objective arguments for stakeholders
2. Setting proper alliances to make change possible
3. Solving technical issues
4. Certification
5. Communication with stakeholders including policy-makers

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