



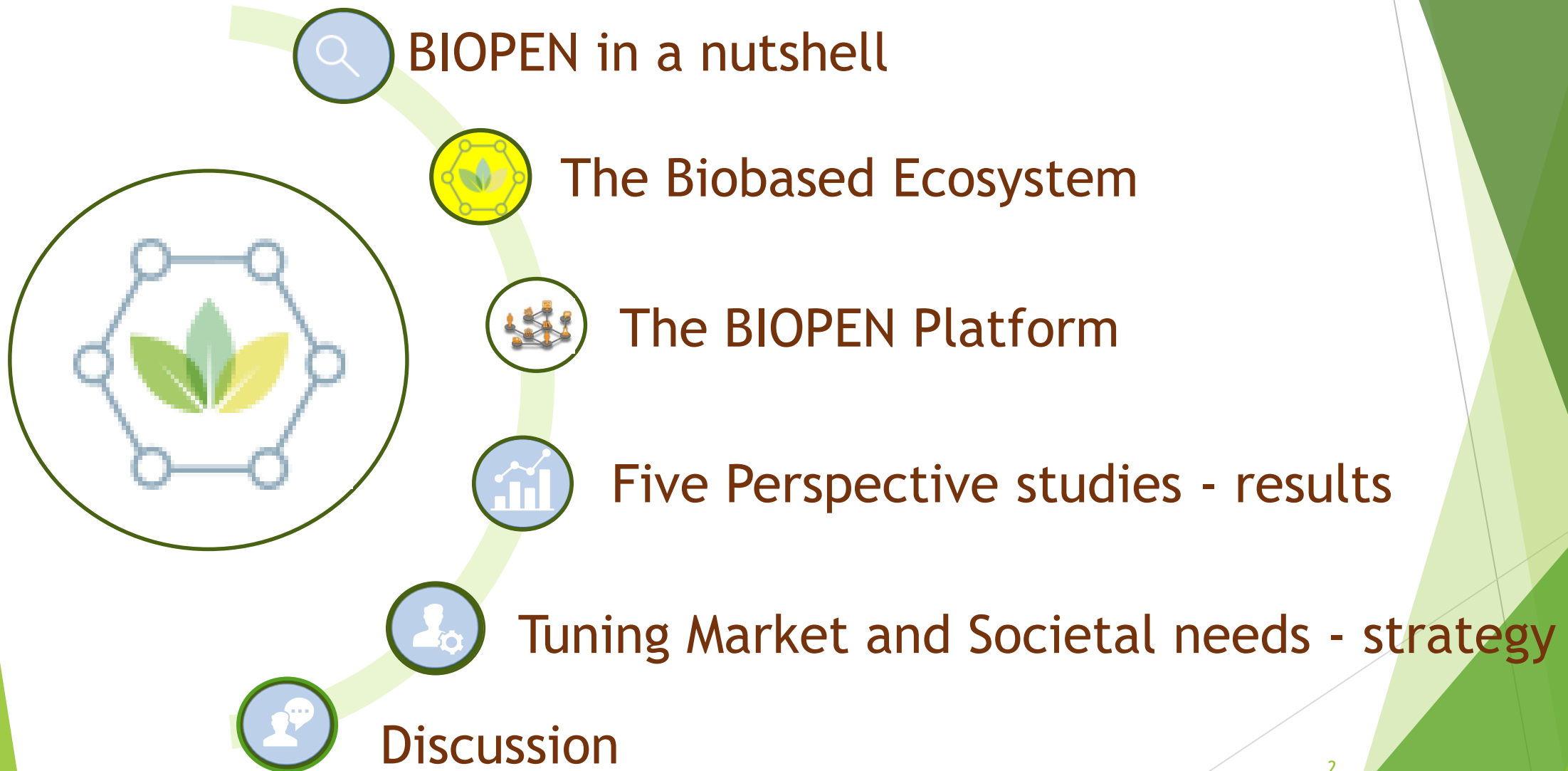
# Outcomes from BIOPEN:

## How to increase market uptake for biobased products

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National Technical University of Athens



# Contents





# BIOPEN in a nutshell



The Biobased Ecosystem



The BIOPEN Platform



Five Perspective studies - results



Tuning Market and Societal needs - strategy



Discussion



# Project details

**Program:** Horizon 2020 / BBI-JU  
Bio-based Industries Joint Undertaking



Start date  
1 May 2017

End date  
31 October 2019



8 more months to go

## Funding

Overall budget:  
€ 1 205 451,25

EU contribution  
€ 994 531

**Mission:** Support collaboration  
and knowledge sharing in the  
bio-based industry



# Partners

## COORDINATION



## IT



Italy

## DISSEMINATION



## RESEARCH



Greece

## INDUSTRY CLUSTERS



Poland



Finland



Germany



Germany



Netherlands

# Objectives and expected outcomes

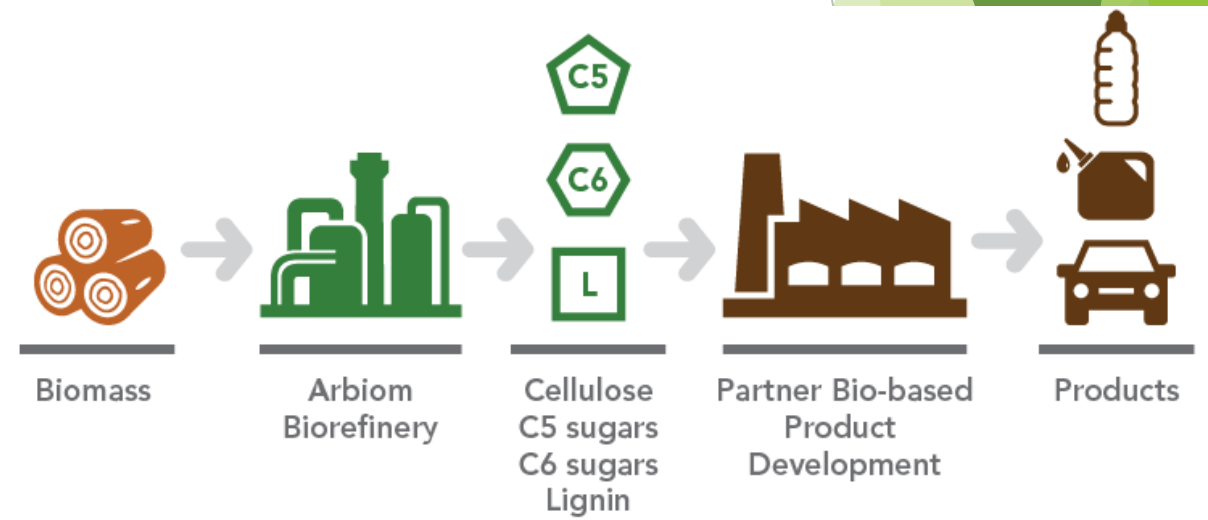
**Mission:** Support collaboration and knowledge sharing in the bio-based industry

**Overall objective:** stimulate the business and innovation potential of the bio-based sector in Europe



## Objectives

- ▶ Five perspective studies on new bio-based products and markets
- ▶ Open-Innovation platform
- ▶ 20 co-innovation partnerships
- ▶ Projects' activities and results wide dissemination



# The BIOPEN HUB

Ecosystem



Studies



Project ideas



Biopen  
platform  
HUB



Collaborations





BIOPEN in a nutshell



**The Biobased Ecosystem**



The BIOPEN Platform



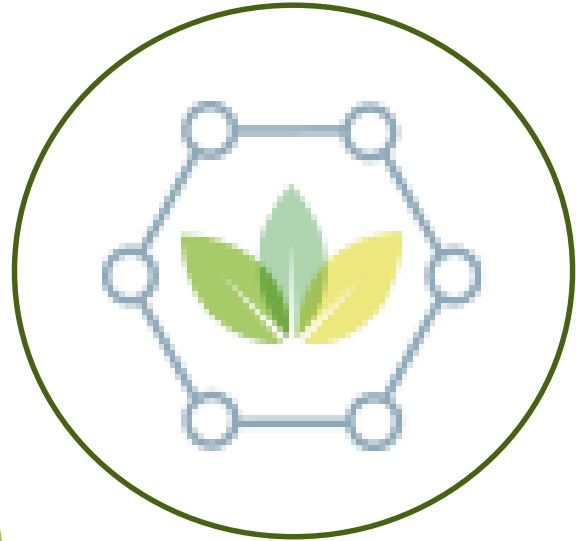
Five Perspective studies - results



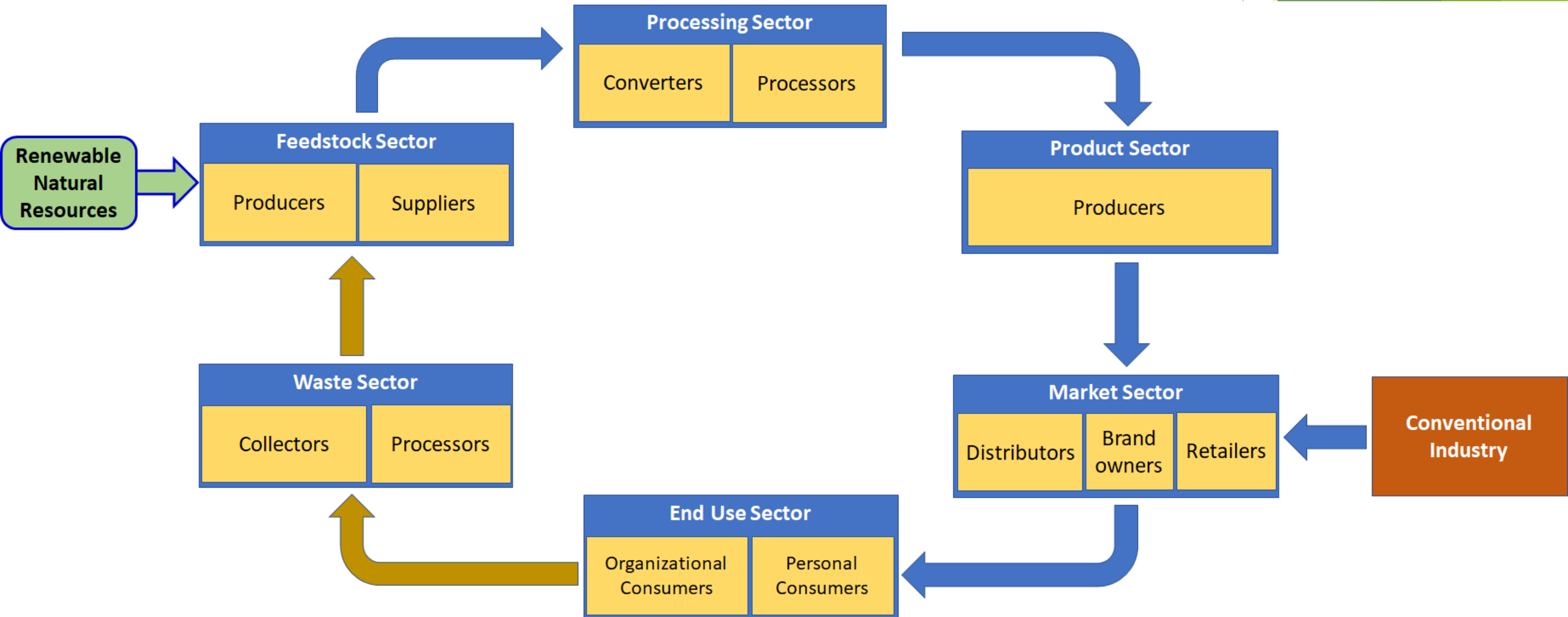
Tuning Market and Societal needs - strategy



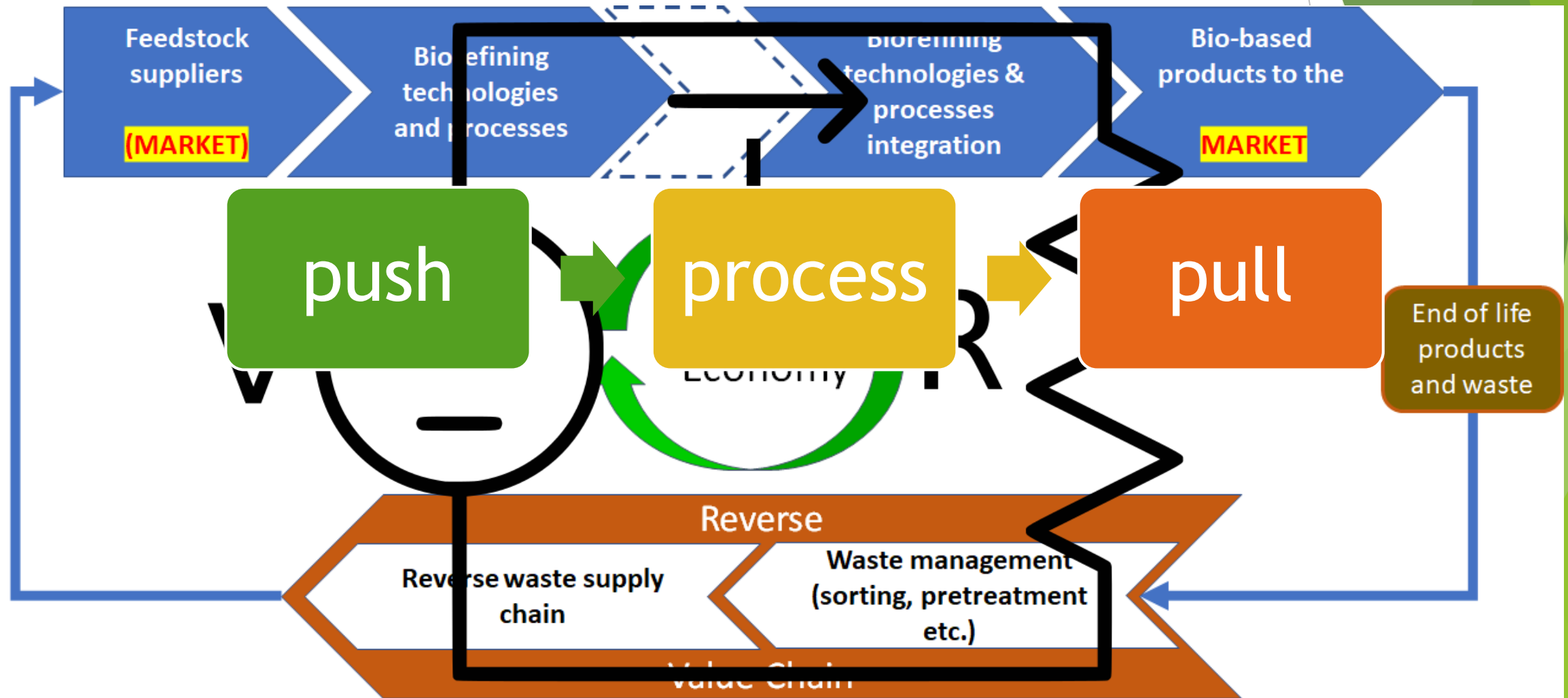
Discussion



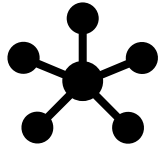
# The Bio-economy Supply chain



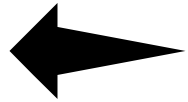
# In the context of circular economy

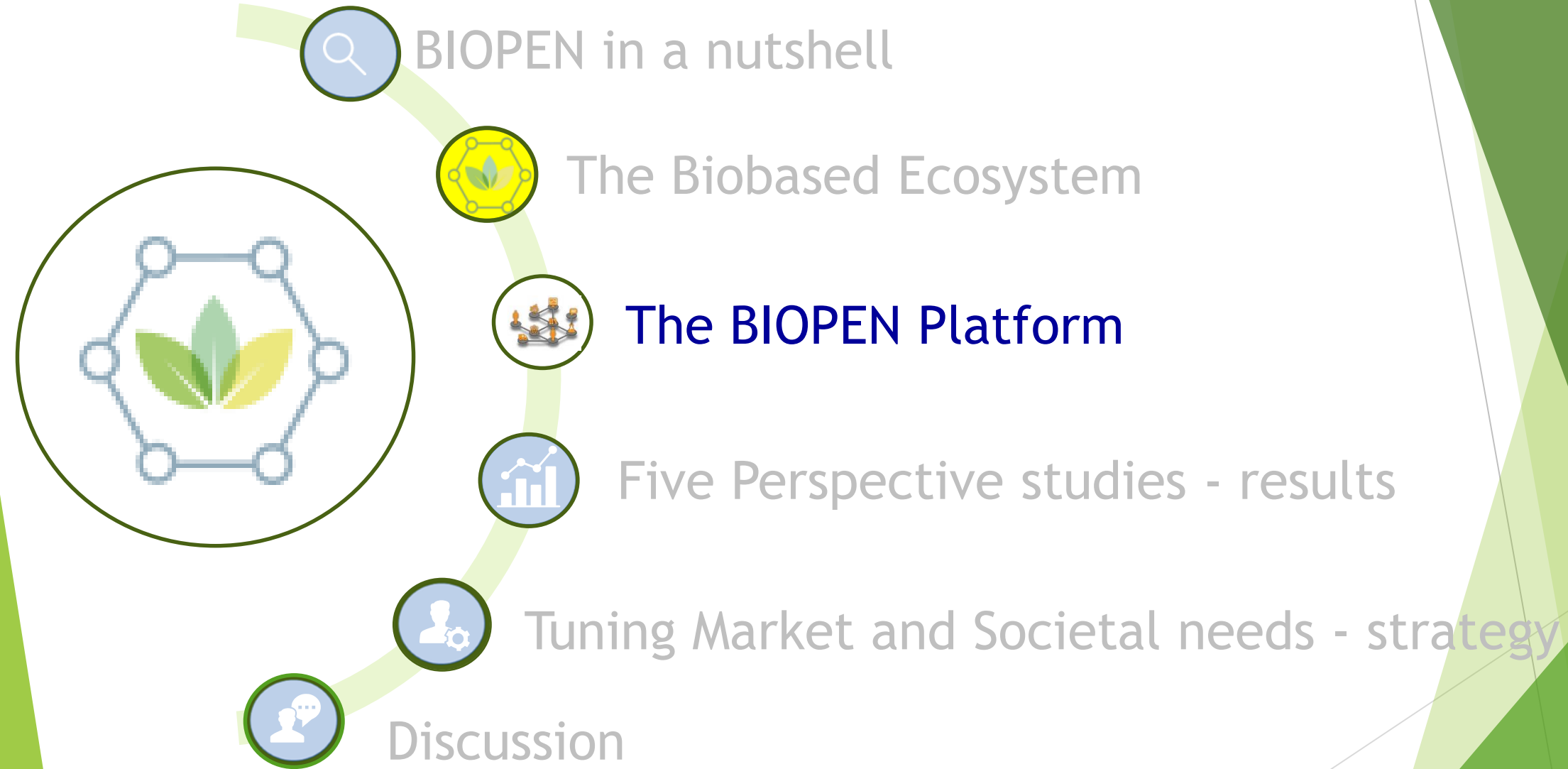


# Taxonomy



Biopen  
platform







## BIOPEN PLATFORM

ACCELERATING AND SUPPORTING  
BUSINESS DEVELOPMENT OF BIO-BASED  
INDUSTRIES AND DOWNSTREAM  
SECTORS

[Read more about the project](#)

### PROJECT OPPORTUNITIES



Browse qualified innovation projects' ideas where partners search are activated by leading European organisation and join projects of your interest.

HEALTHY VEGETABLE SNACKS

**Deadline:** TBA

IMPROVING THE PERFORMANCE OF  
BIOCATALYSTS THROUGH THE APPLICATION OF  
DEEP EUTECTIC SOLVENTS (DESS) APPLICATION –  
BIO.DES

**Deadline:** September 6th, 2018

NEW ENERGY

**Deadline:** September 12th, 2018

[See all](#)

### FUNDS FOR INNOVATION



Search grants for R&D in our updated database of National and European funding programs.

MIUR: BLUEBIO: CALL FOR PROPOSALS 2019

**Deadline:** March 17th, 2019

REGIONE LOMBARDIA: CALL AREE INTERNE

**Deadline:** May 15th, 2019

INTERREG ITALY-SLOVENIA: CALL FOR  
PROPOSALS N.7/2019

**Deadline:** March 15th, 2019

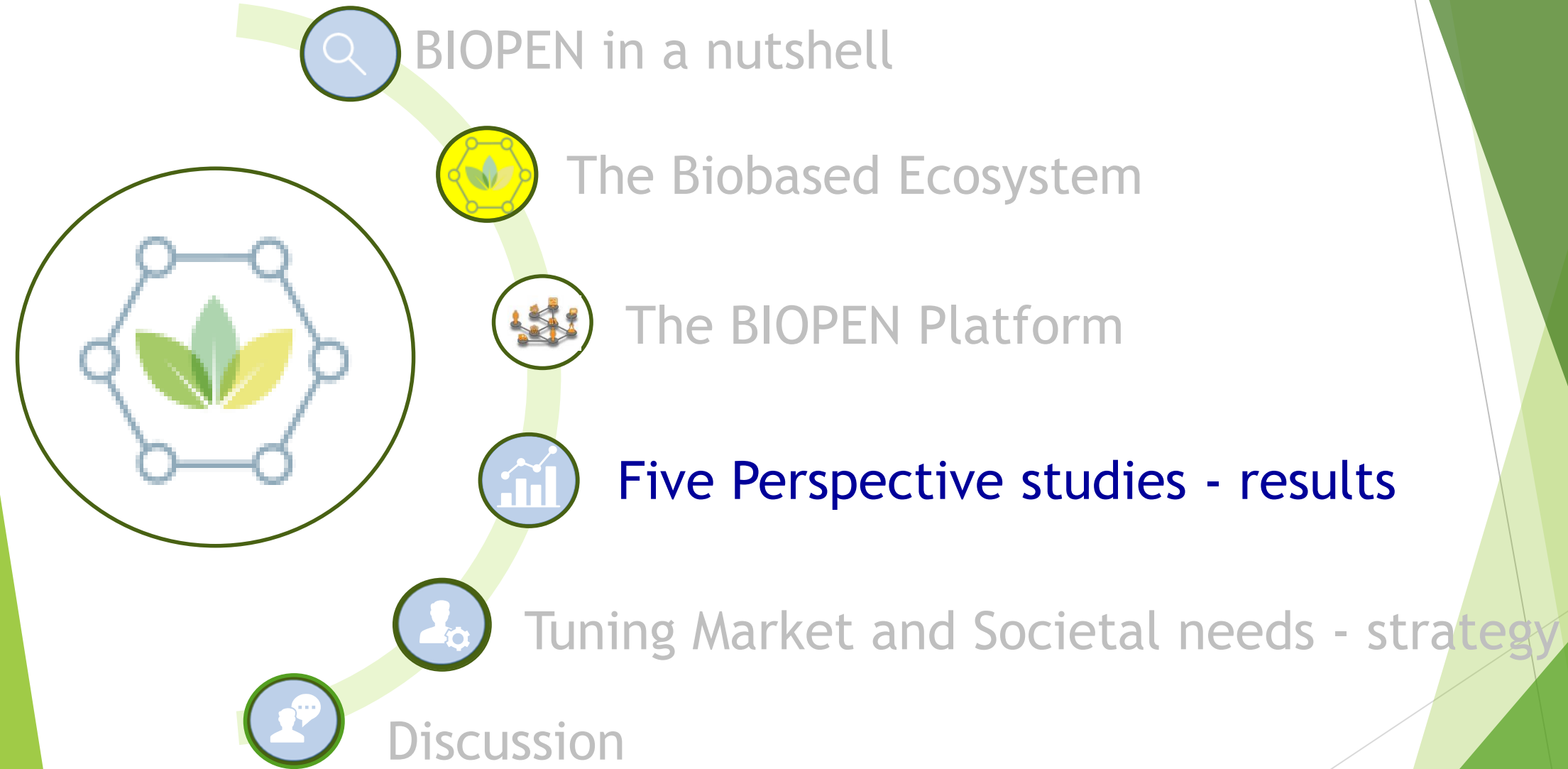
[See all](#)

### FIND COLLABORATION



Complete your professional profile in order to increase the visibility and to be contacted from the other members of the community to start your joint innovation project in the bio-based industries and downstream sectors. Start building your global innovation, research and development network.

[Join BIOPEN](#)



# The 5 perspective studies

- ▶ 1. Environmentally friendly coatings and packaging materials (WPCC)
- ▶ 2. Functional polymer and oligomer products (CLIB)
- ▶ 3. Products and applications based on lignocellulosic feedstock, mainly wood (BCM)
- ▶ 4. Alternative aromatics from green raw materials for the production of synthetic materials, chemicals and coatings (BBD)
- ▶ 5. Algae and seaweed ingredients in food products (BBD)

# 1. Coatings and packaging materials - Highlights

- ▶ The European packaging industry has a market value of about 80 billion EUR and accounts for about 40% of the global packaging market.
- ▶ **Future trend:** monolayer biodegradable packaging **RECYCLABLE BY DESIGN**
- ▶ Packaging products manufactured from renewable materials currently only represent about 2% of the market **SIGNIFICANT PULL!**
- ▶ Certification and compliance status **STANDARDIZATION** a new business on its own right
- ▶ Main challenges:
  - ▶ for the market diffusion of biopolymers for coating and packaging are the **higher production cost** compared to the fossil based counterparts
  - ▶ environmental conscious consumer attitude

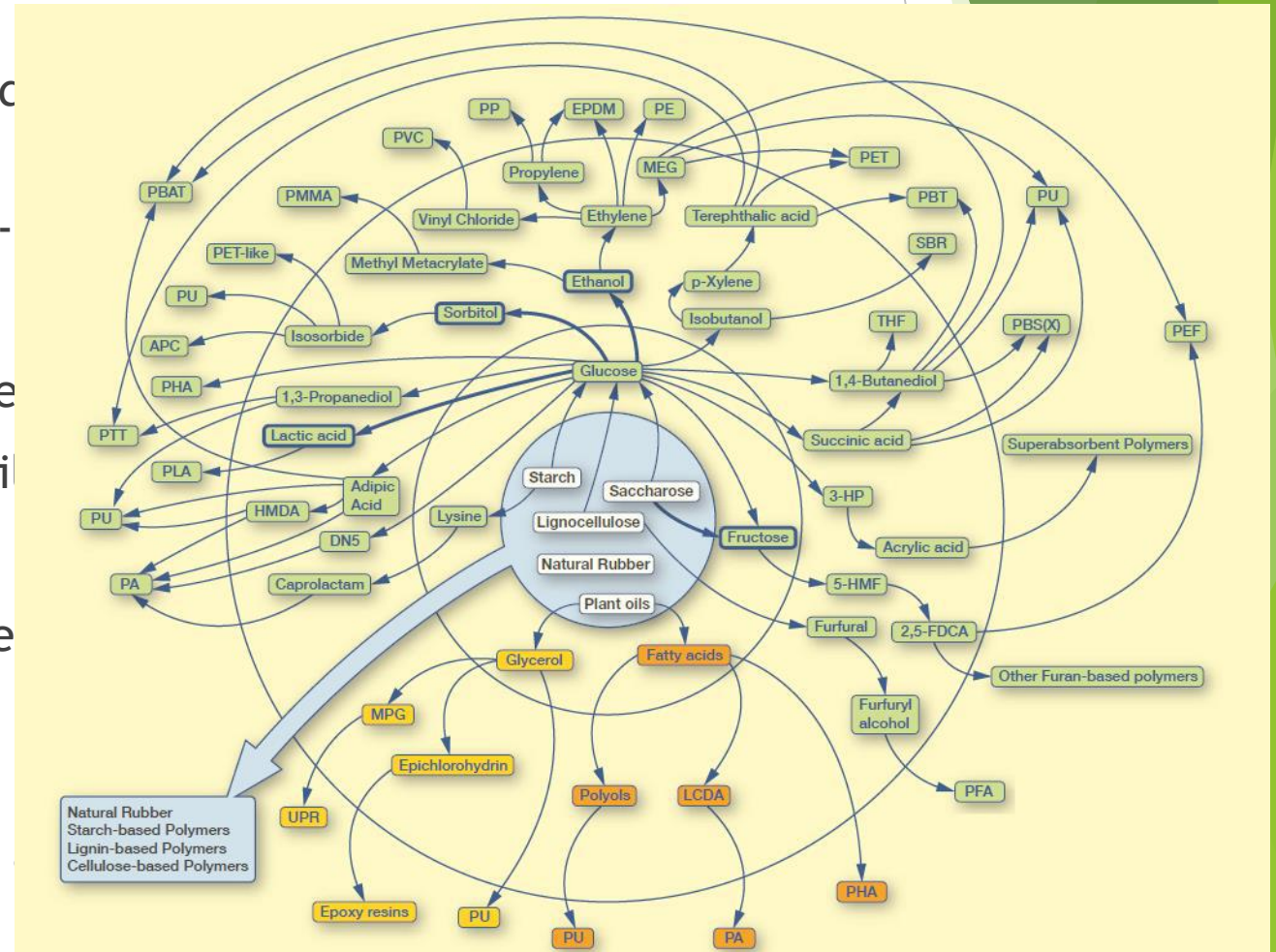


IMPROVE TECHNOLOGIES AND INCREASE PUBLIC AWARENESS

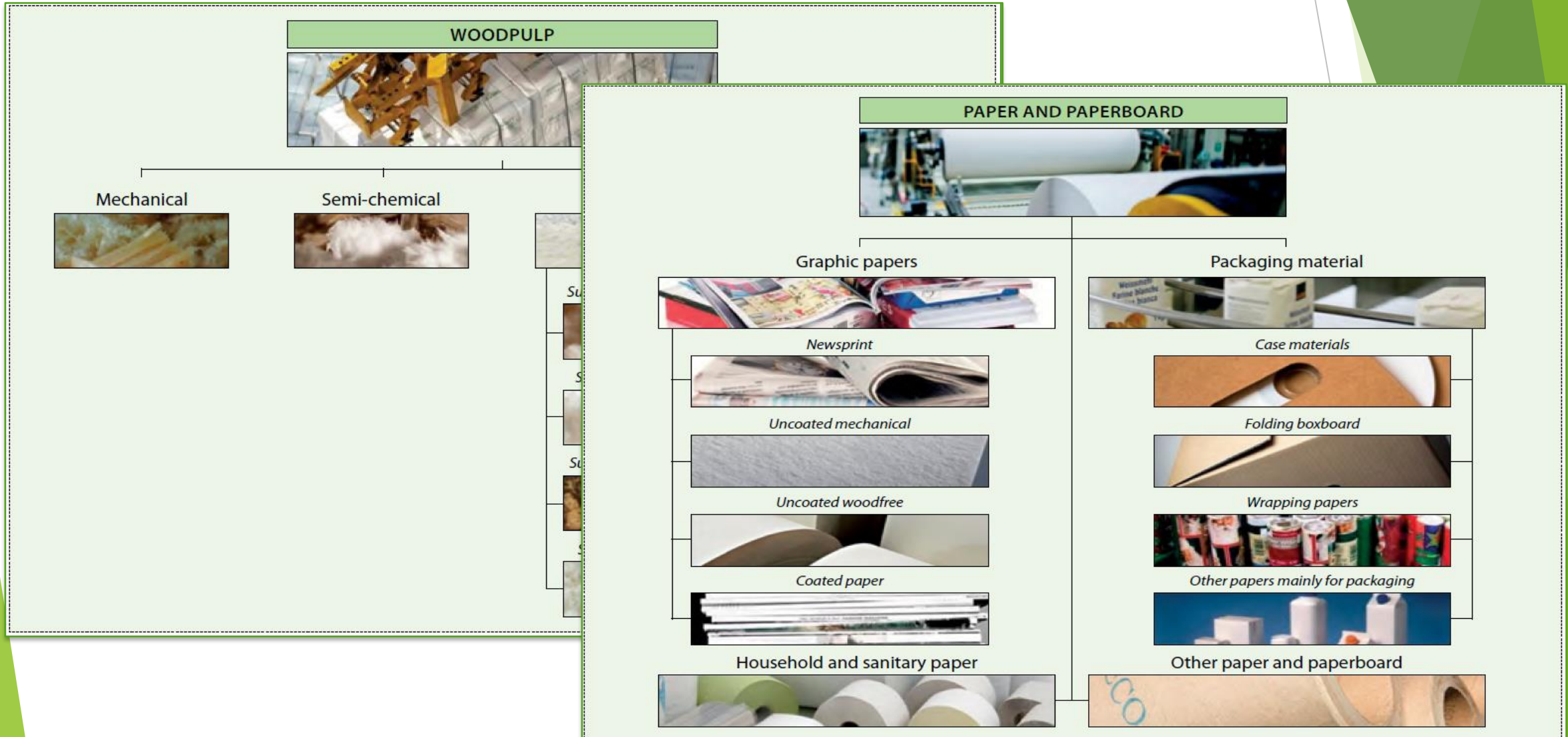
## 2. Functional polymer and oligomer products - Highlights

overview of bio-based polymers

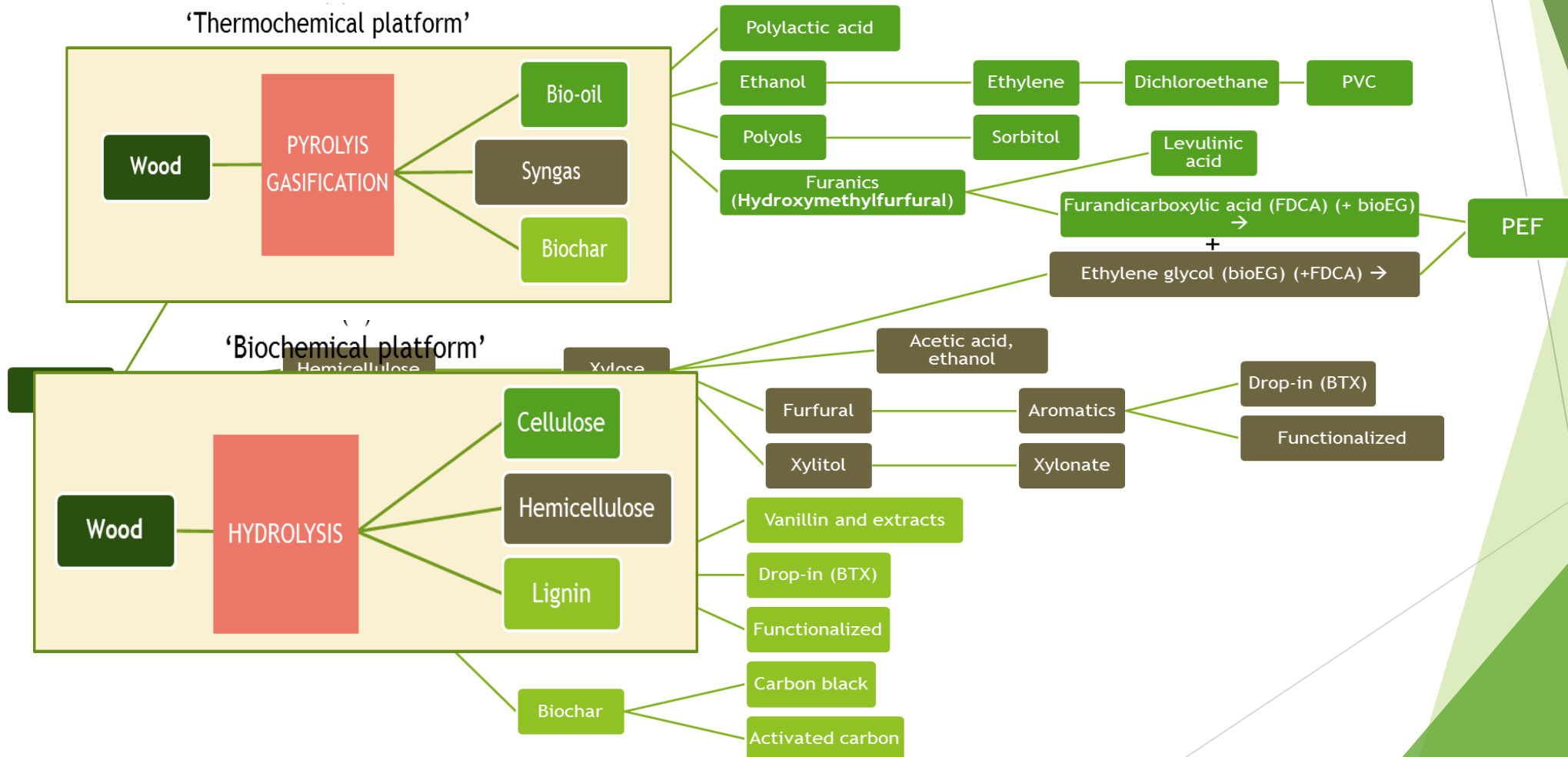
- ▶ As of 2016, plastics production has already reached **52% increase from 2004**. **PULL**
- ▶ Measures for the proliferation of the bio-based sector:
  - ▶ The intensification of the CO2 tax,
  - ▶ The introduction of tax on fossil-based products
  - ▶ Introduction of Life Cycle accounting
  - ▶ Financial incentives:
    - ▶ (i) low VAT on bio-based, and adequate for fossil-based products
    - ▶ (ii) Sharing best practices,
    - ▶ (iii) clustering and joint projects



### 3. Products and applications based on lignocellulosic feedstock - Highlights

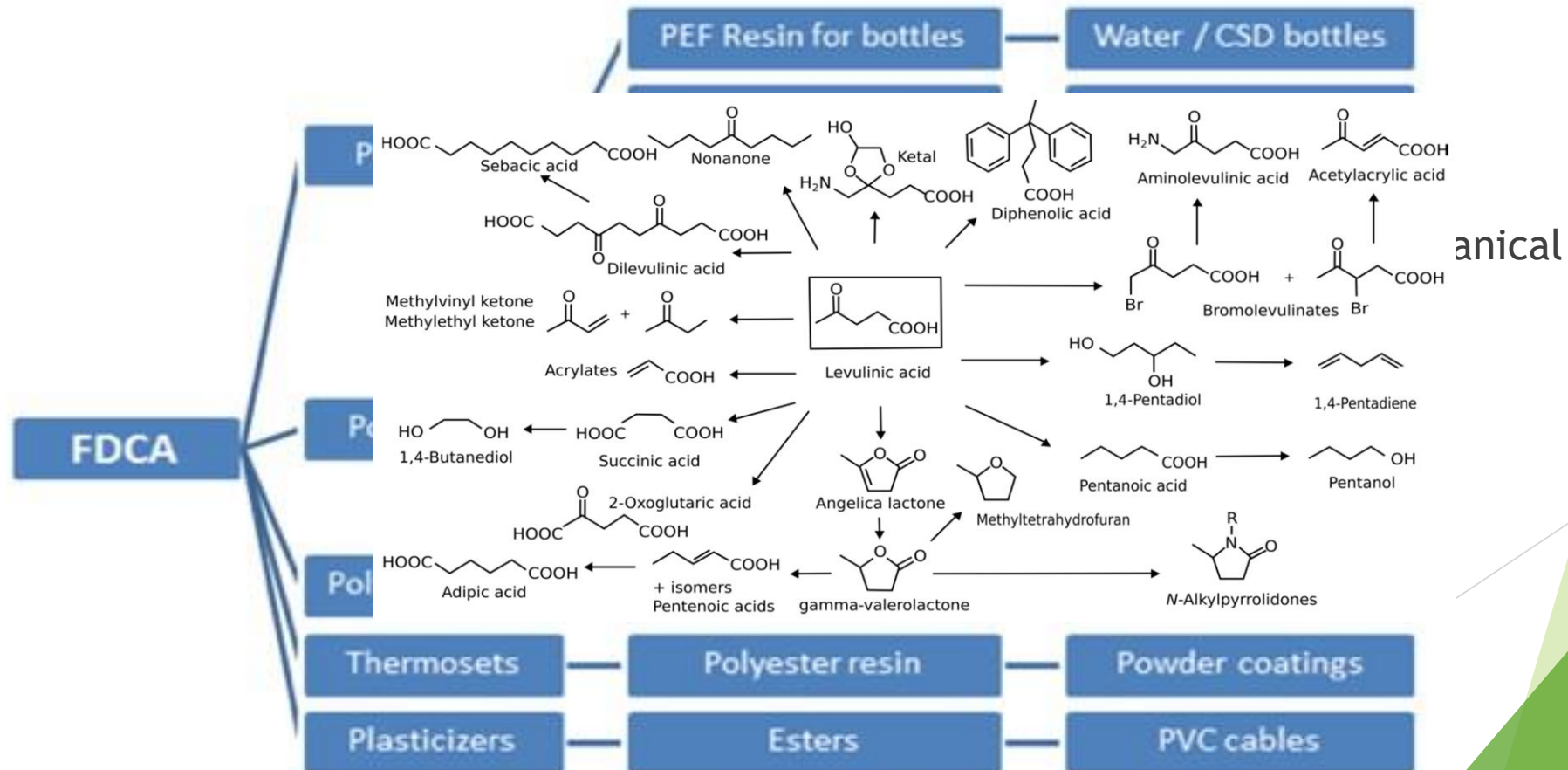


### 3. Products and applications based on lignocellulosic feedstock - Highlights



### 3. Products and applications based on lignocellulosic feedstock - Highlights

- Complex chemical structures that cannot be replicated by human **HIGH ADDED**



## 4. Alternative aromatics - Highlights

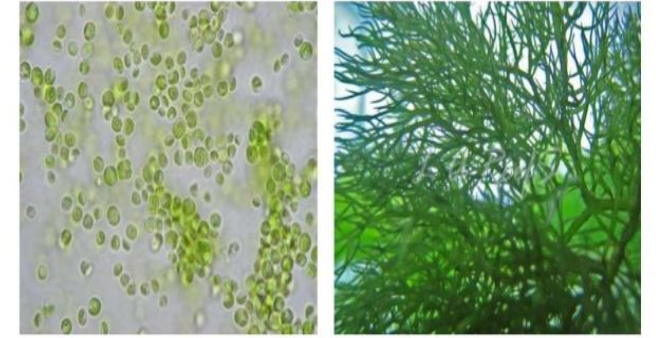
- ▶ Benzene, toluene, xylene (BTX) and Phenol
- ▶ Bio-based aromatics as **drop-in**
- ▶ **Functionalised aromatics** new innovative molecules that cannot be derived from petroleum origins **NEW MARKET**



## 4. Alternative aromatics - Highlights

- ▶ Market uptake measures:
  - ▶ Technology developed and scaled-up (lab → pilot → demo → industrial)
  - ▶ Integrate value chain actors
  - ▶ Secure feedstock
  - ▶ Incentives and policies
  - ▶ Public awareness
  - ▶ Industrial clustering (economies)
  - ▶ Optimally organized biomass production
  - ▶ Participation of SMEs

# 5. Algae and seaweed products - Highlights



- ▶ Distinction between macroalgae and microalgae
- ▶ Enormous biodiversity → numerous applications (medical, nutritional etc.)
- ▶ **Key conclusion:** Research on the behaviour and properties of unexplored micro-algae species must be reinforced
- ▶ **Key observation:** Algae offer efficient carbon capture and conversion of solar energy to bio-based products including transport fuel largely **disconnected from land issues**.
- ▶ **Products:**

**FATTY ACIDS**, **Key conclusion:** therapeutic properties of omega-3 fatty acids suggest a very large market to algal-derived fatty acids

**POLYSACCHARIDES**, **Key conclusion:** Microalgae are the source of polysaccharides, and the **market for is** in the hundreds of millions of dollars.

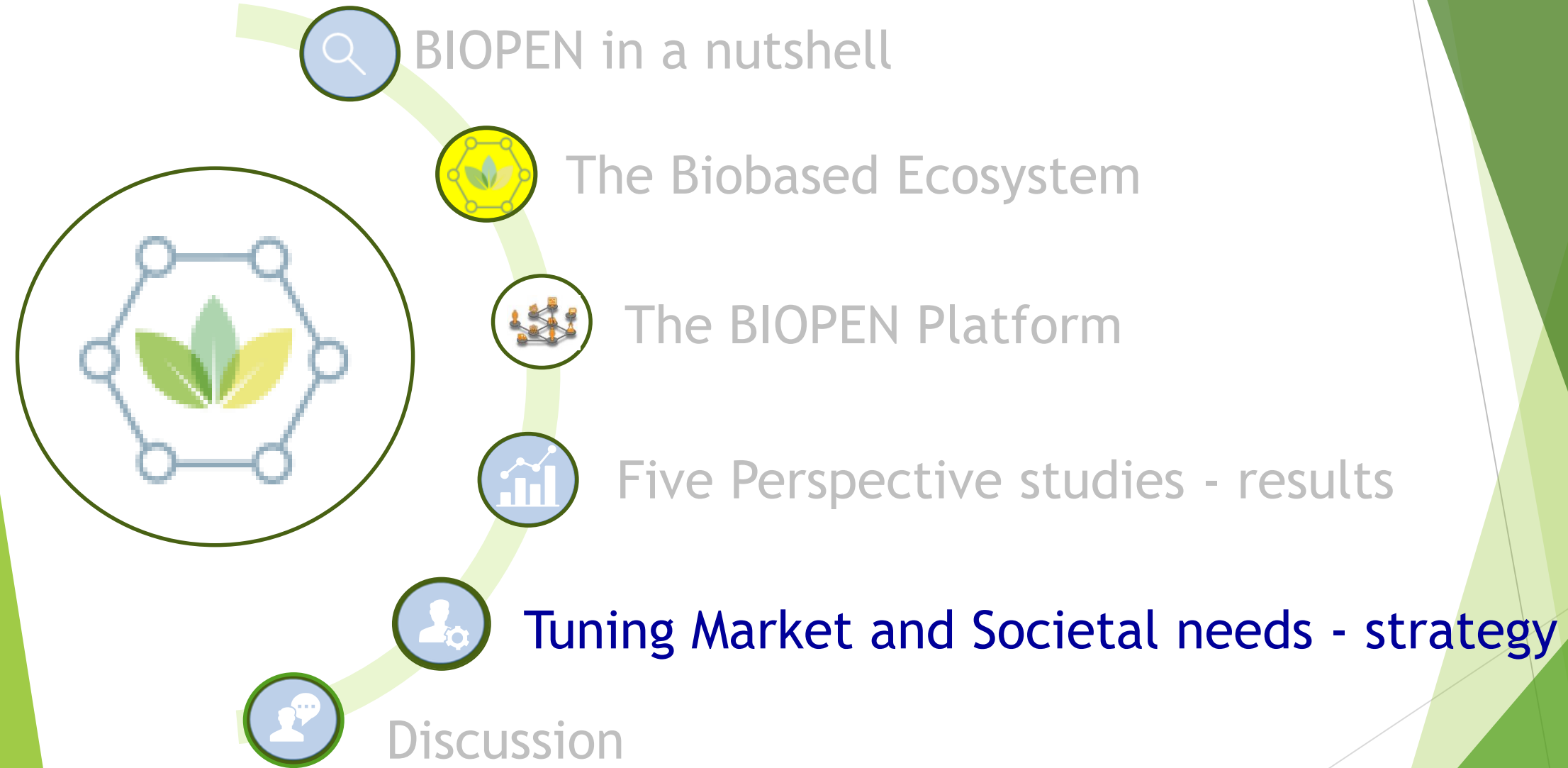
**FOOD COLORING AND OSMOREGULATORS**, **Key conclusion:** The potential market for microalgae-derived food colouring is significant.

**BIOPLASTICS**, **Key conclusion:** Algae for plastics is a mature, economic and sustainable solution.

**The economics of algae:** The trend towards addressing higher value markets such as condiments for human food, and inclusion in cosmetics products should be encouraged.

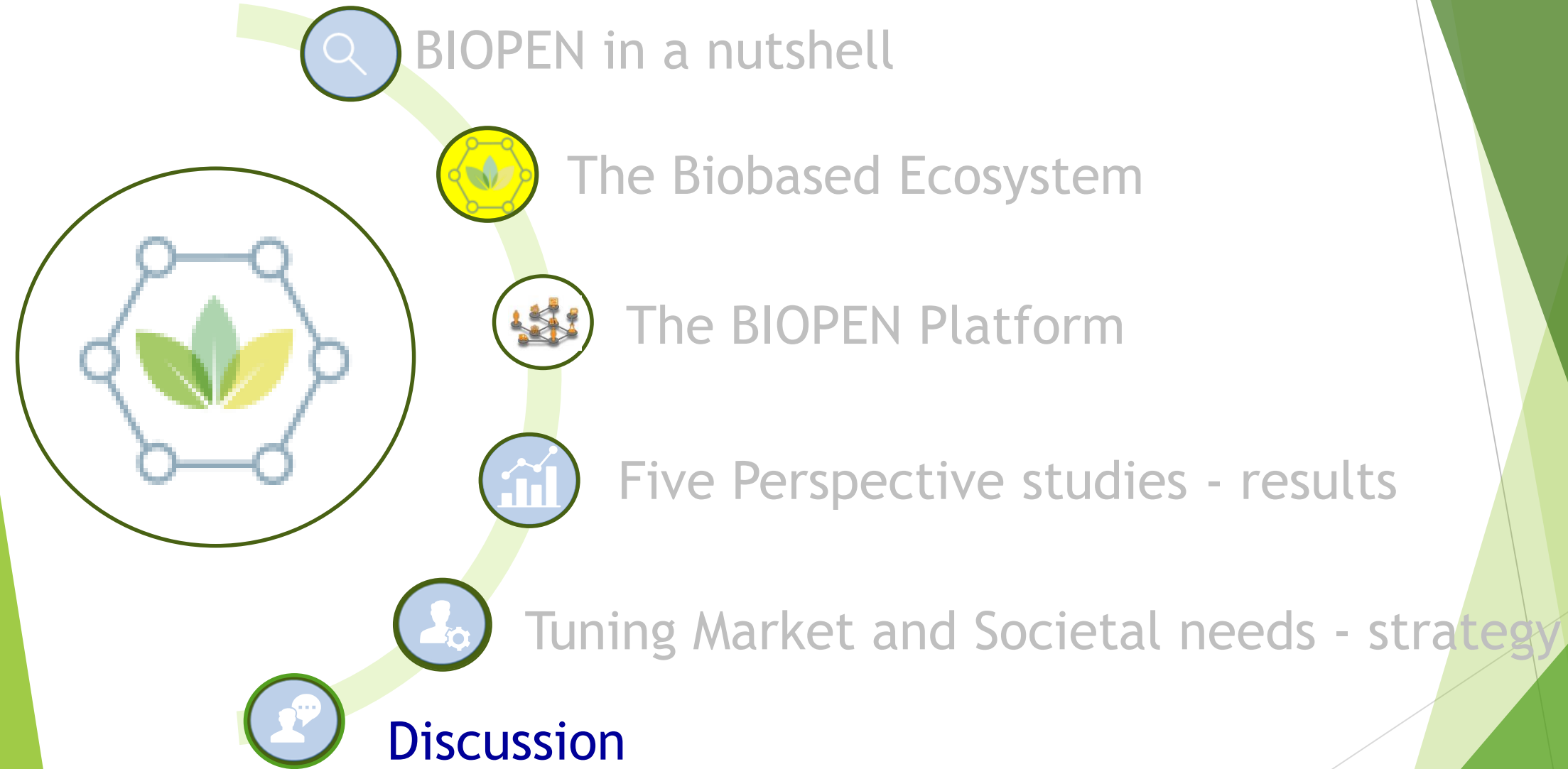
# Overall conclusions of the study

- ▶ Europe has a number key competitive advantages
- ▶ The global market for bioproducts should reach \$714.6 billion by 2021 from \$466.6 billion in 2016 at a compound annual growth rate (CAGR) of 8.9%, from 2016 to 2021
- ▶ The portfolio of possible products should include a wide range from high volume low price commodities
- ▶ Needed policies and incentives: subsidies for green chemicals, TAX reduction, LC accountability, clustering,
- ▶ Technology must be improved
- ▶ Sharing best practices
- ▶ Clustering of industrial plants and integration of the supply chain
- ▶ Biomass production optimal coordination and management
- ▶ Public awareness through targeted campaigns



## Task 3.2 Fine tuning Market and Societal needs

- ▶ Mapping current social needs for novel bioproducts and the profile of the market trend
- ▶ **Goal:** Foresee future needs, anticipate environmental and societal challenges, and then, adapt to a dynamically changing socioeconomic environment.
- ▶ Task 3.3 is building links between market, society, industry and policy makers utilizing the BiOPEN Platform as a key tool for networking, dissemination and accumulation of information for reading the pulse of the market-society nexus in the face of the new bio-economy developments.



Thanks for your attention!

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