



# Une économie biobasée durable pour l'Europe

AG VALBIOM 2018    Namur, 16 mai 2018

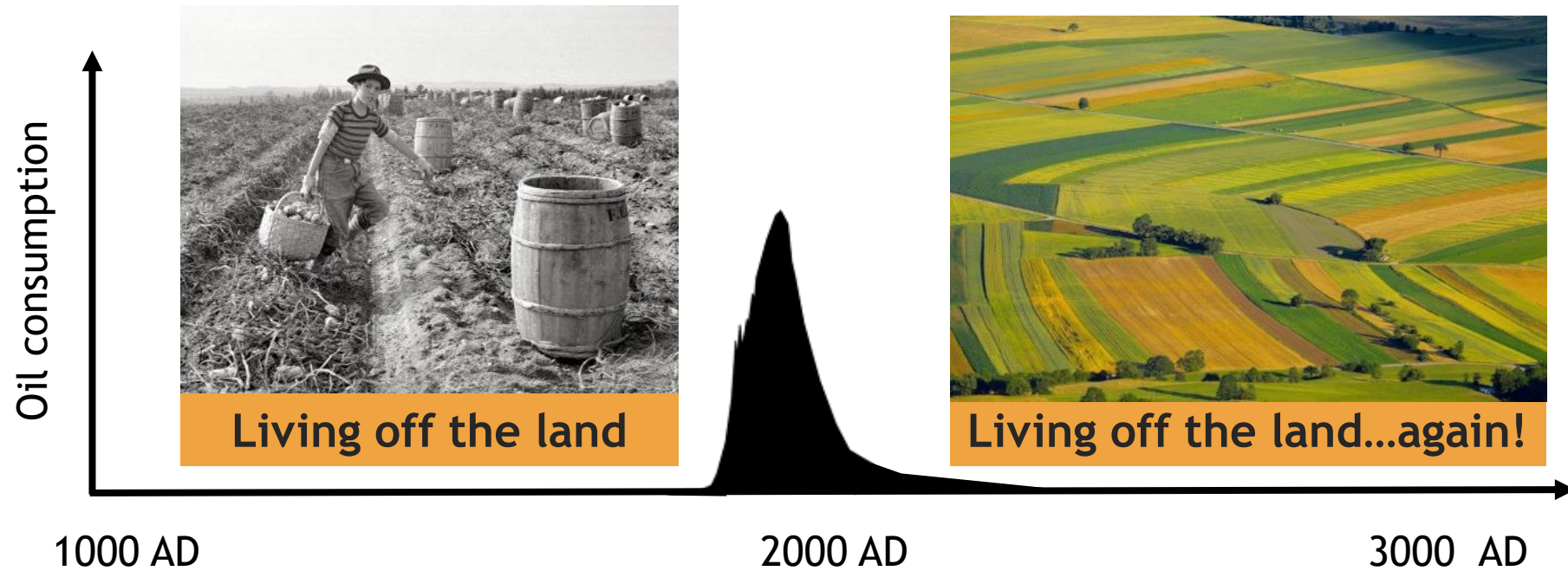


Philippe Mengal  
BBI JU Executive Director



# Bioeconomy: already a reality today

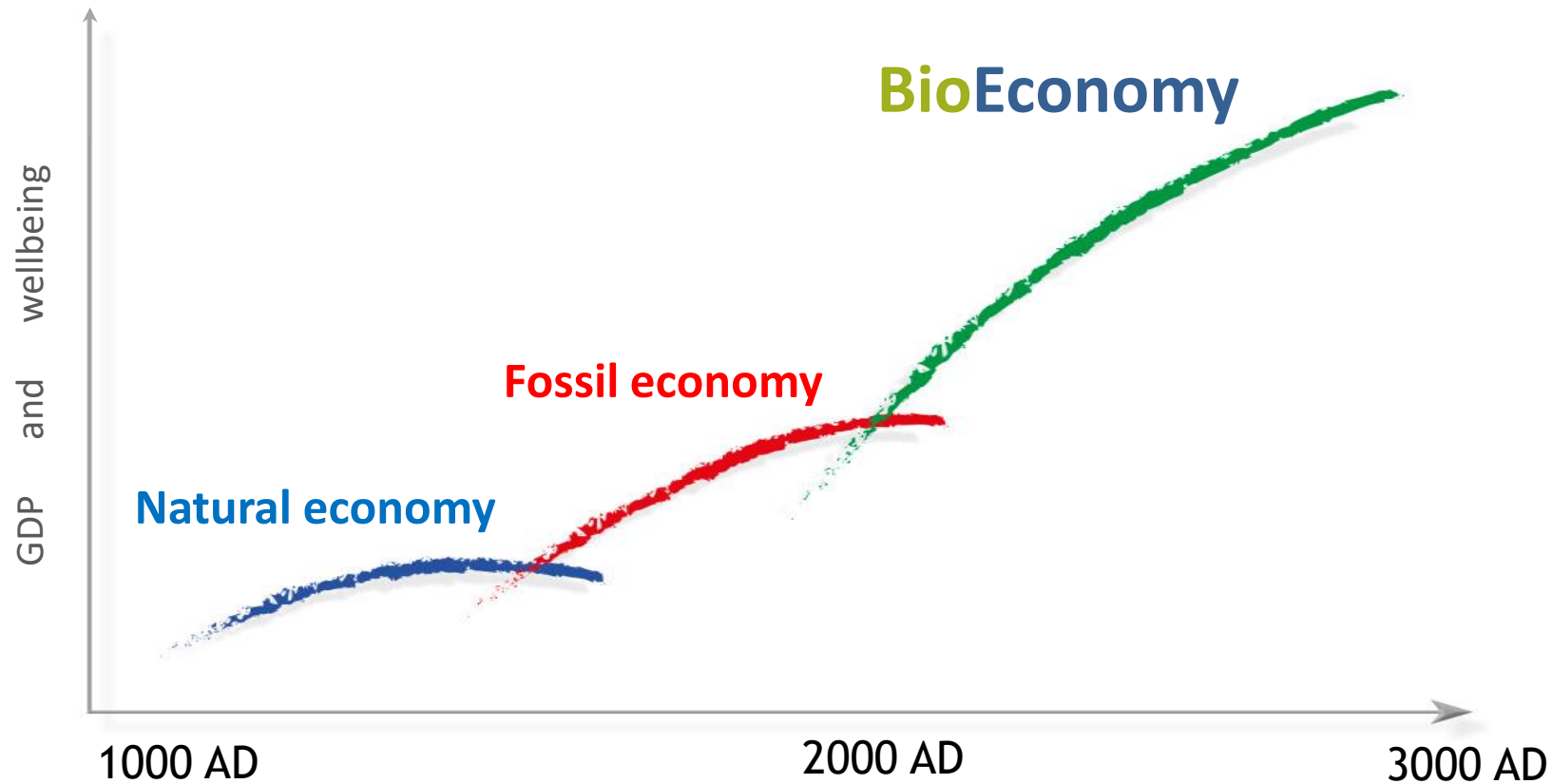
Fossil economy is just a brief moment in our history





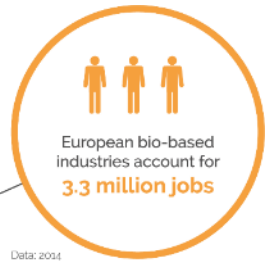


(How) do we want to achieve it?  
Europe on the driver's seat?  
Shape the Bioeconomy we want?

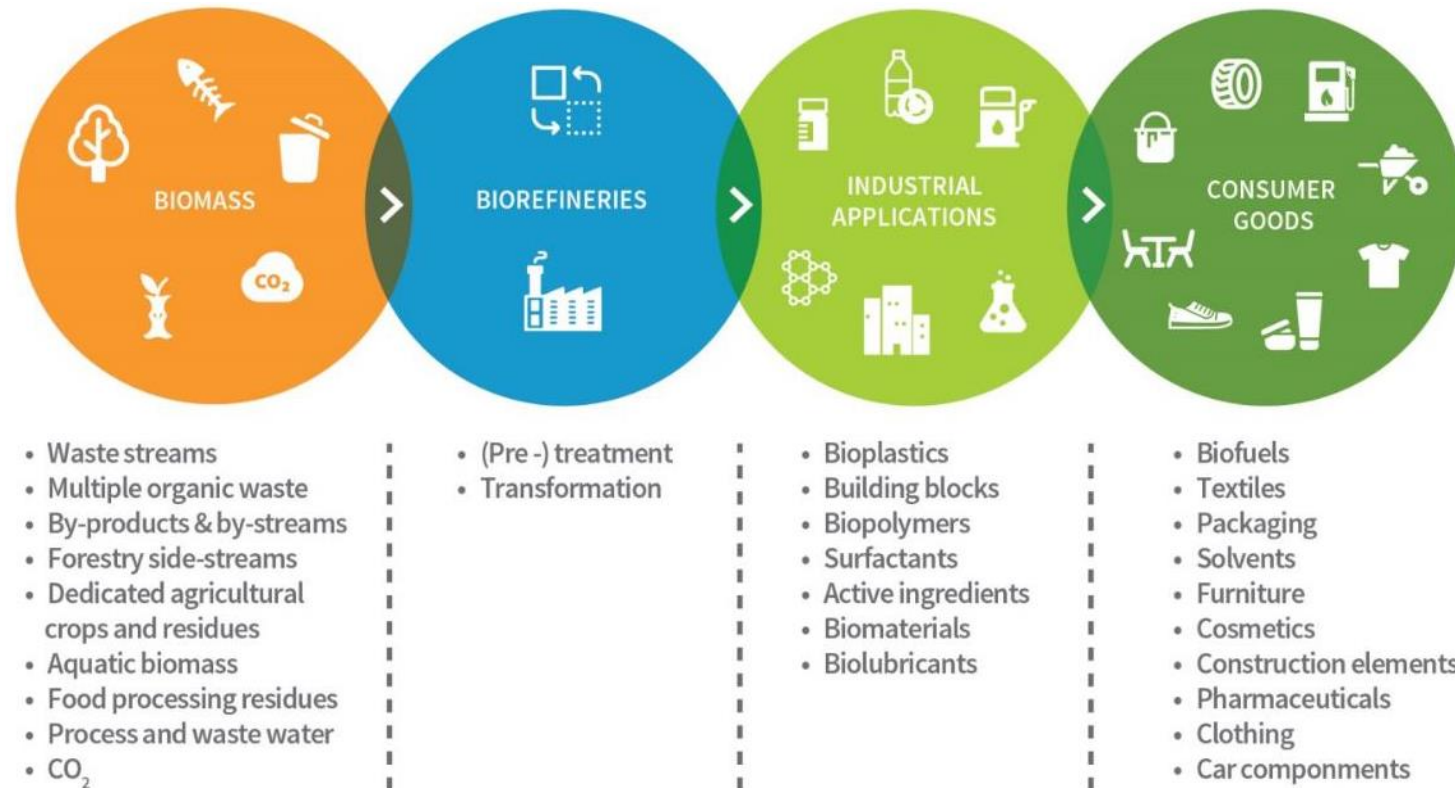




# Bio-based industries value chains



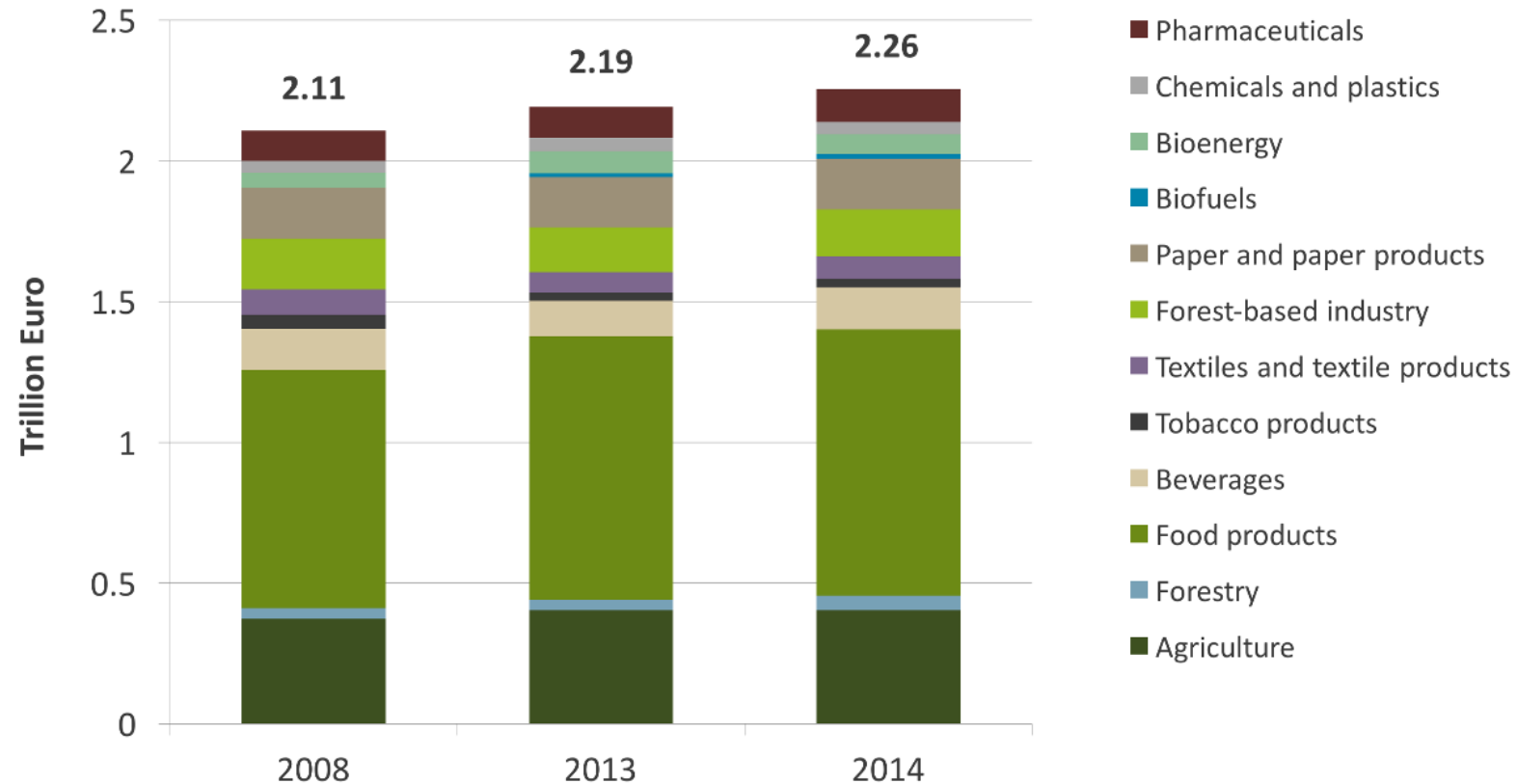
BBI value chains represent 3.7 million jobs\* and € 698 bn turnover\* but **extremely fragmented** between **actors** and across **geographies**



\*Based on EUROSTAT figures 2015

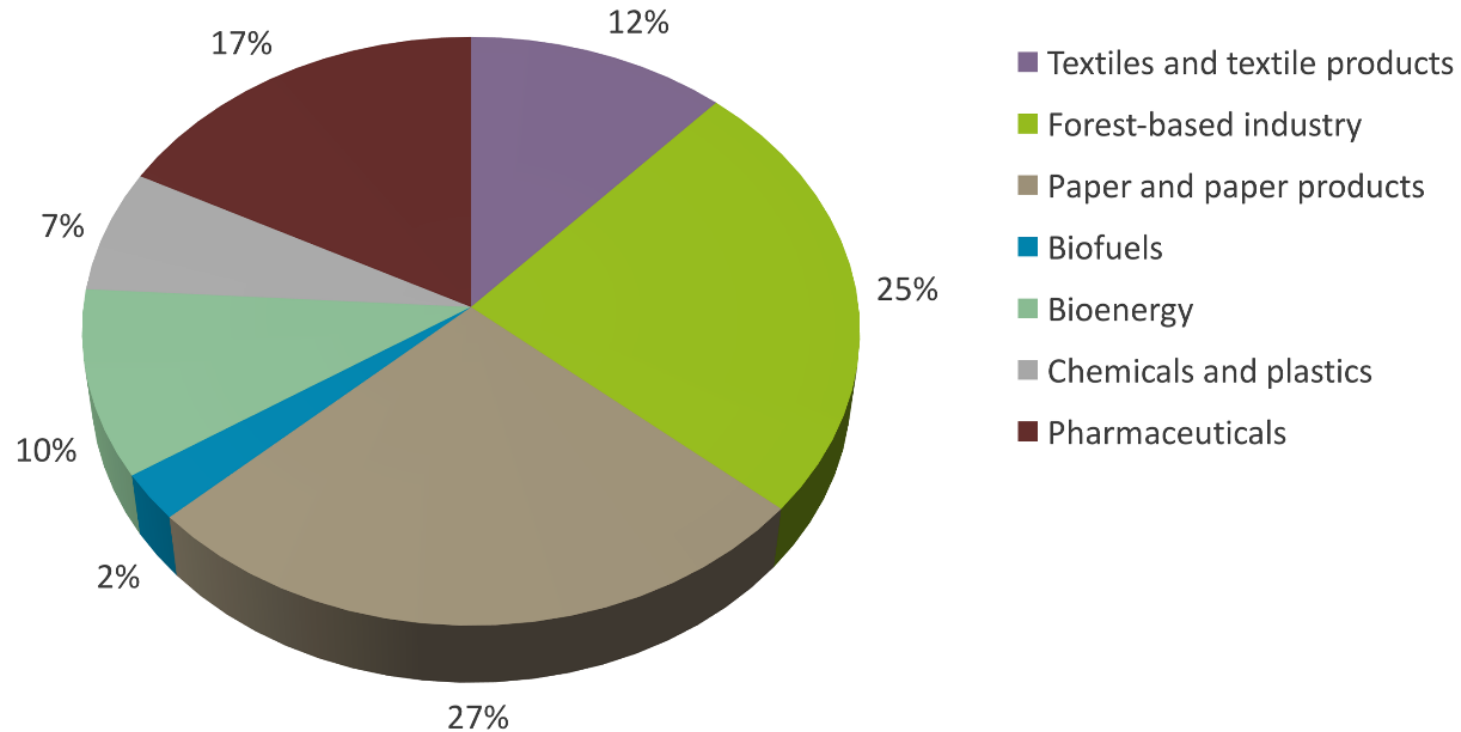


## Turnover in the *Bioeconomy* in the EU-28 (2015): 2.2 trillion EUR



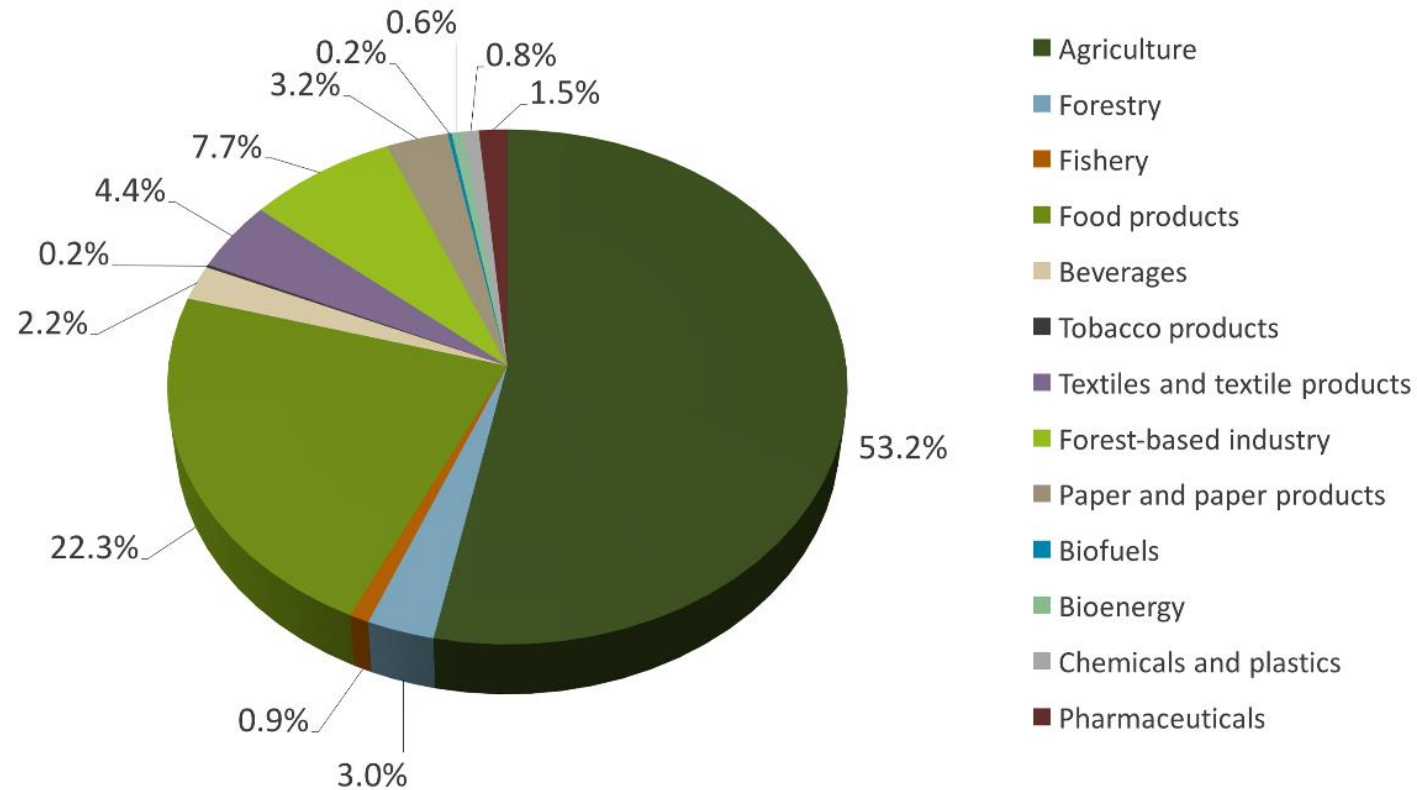


## Turnover in the *Bio-Based* Economy in the EU-28 (2015): 698bn EUR





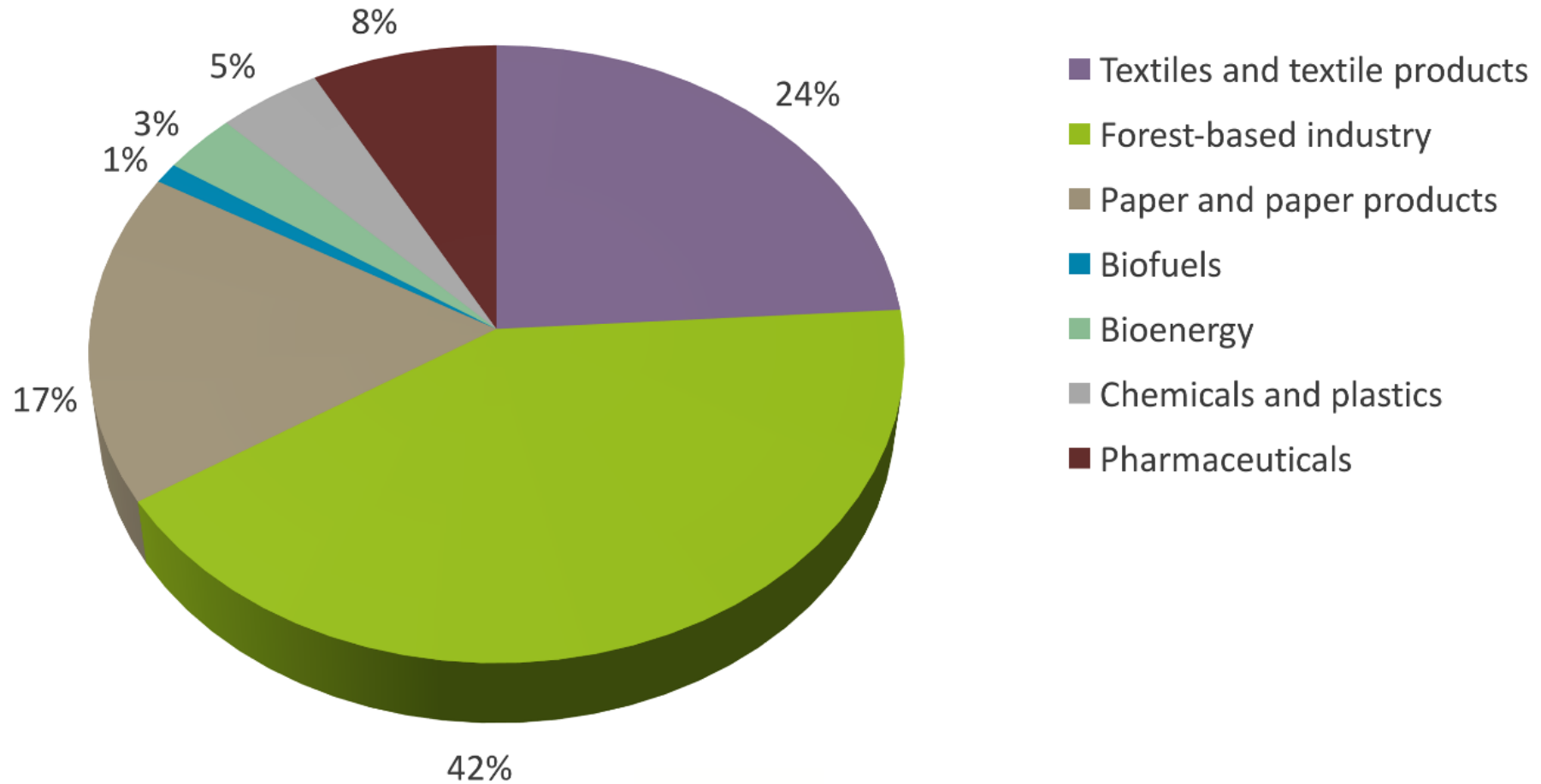
## Employment in the Bioeconomy in the EU-28 (2015): 18.3m employees



The total employment in the European Bioeconomy is 18.3 million employees with primary biomass production (agriculture and forestry) as the biggest contributor (56%).



## Employment in the Bio-Based Economy in EU-28 (2015): 3.7m employees

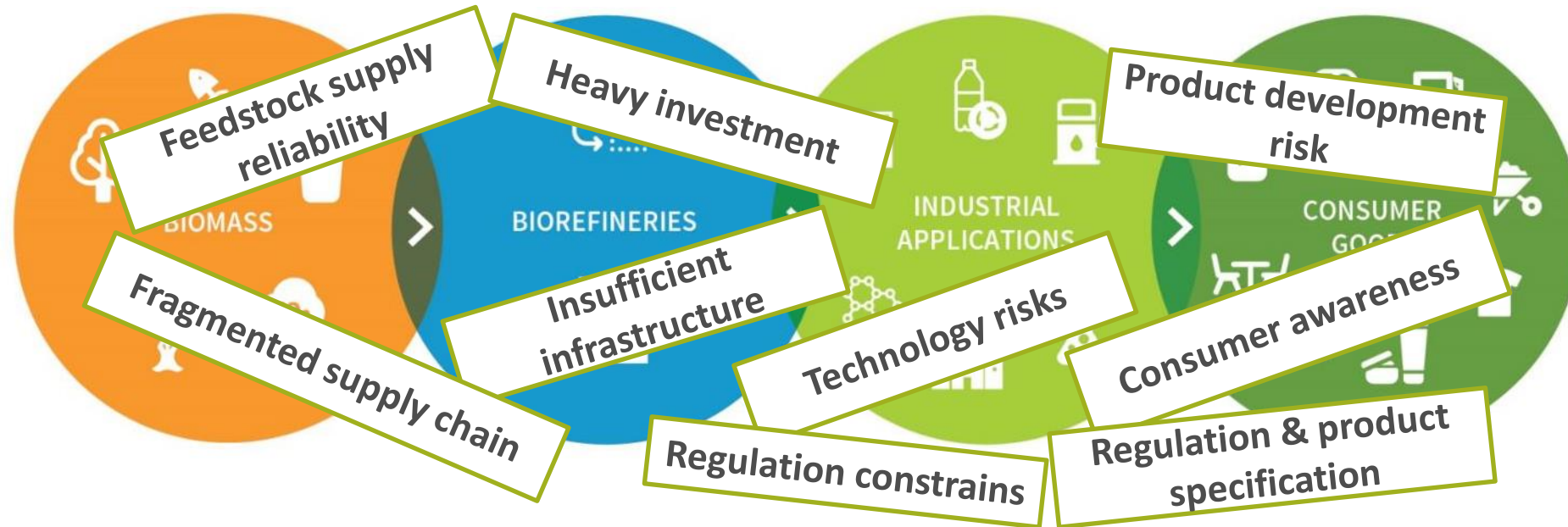






# Bio-based industries (BBI) value chains

Bio-based industries value chains are faced  
with several challenges and risks





# Where we are coming from... value chains in silos



1. Lignocellulose

2. Forest based

3. Agro based

4. Organic waste

5. Aquatic biomass



# Where we want to be...



1. Greater integration of stakeholders
2. Connections across value chains
3. New value chains
4. Benefit throughout the value chain



# Major Trends in Bio-Based Industries

- First wave:

Biotech processes to produce vitamins and amino acids, bioethanol as fuel, natural food ingredients → since 80ies, high growth, some complete shifts

- Second wave:

First generation biodegradable bioplastics such as PLA, starch-based materials or PHA → since 90ies, significant growth

- Third wave:

Drop-in bioplastics using bioethanol and glycerol as platforms leading to PE, PP, PET or Epoxides via ethylene, MEG,... → since few years, very high growth

- New wave:

Development of biobased platform chemicals for polymer and non-polymer applications, especially ethylene, MEG, lactic acid, succinic acid, propane diol, epichlorohydrine, butanediol, ...

- Expected next waves:

Sourcing from non-food biomass (cellulosics, incl. paper), lignin-based chemistry, integrated biorefineries, catalyst chemistry (metathesis), thermo-chemistry and use of crackers (incl. C1 chemistry)

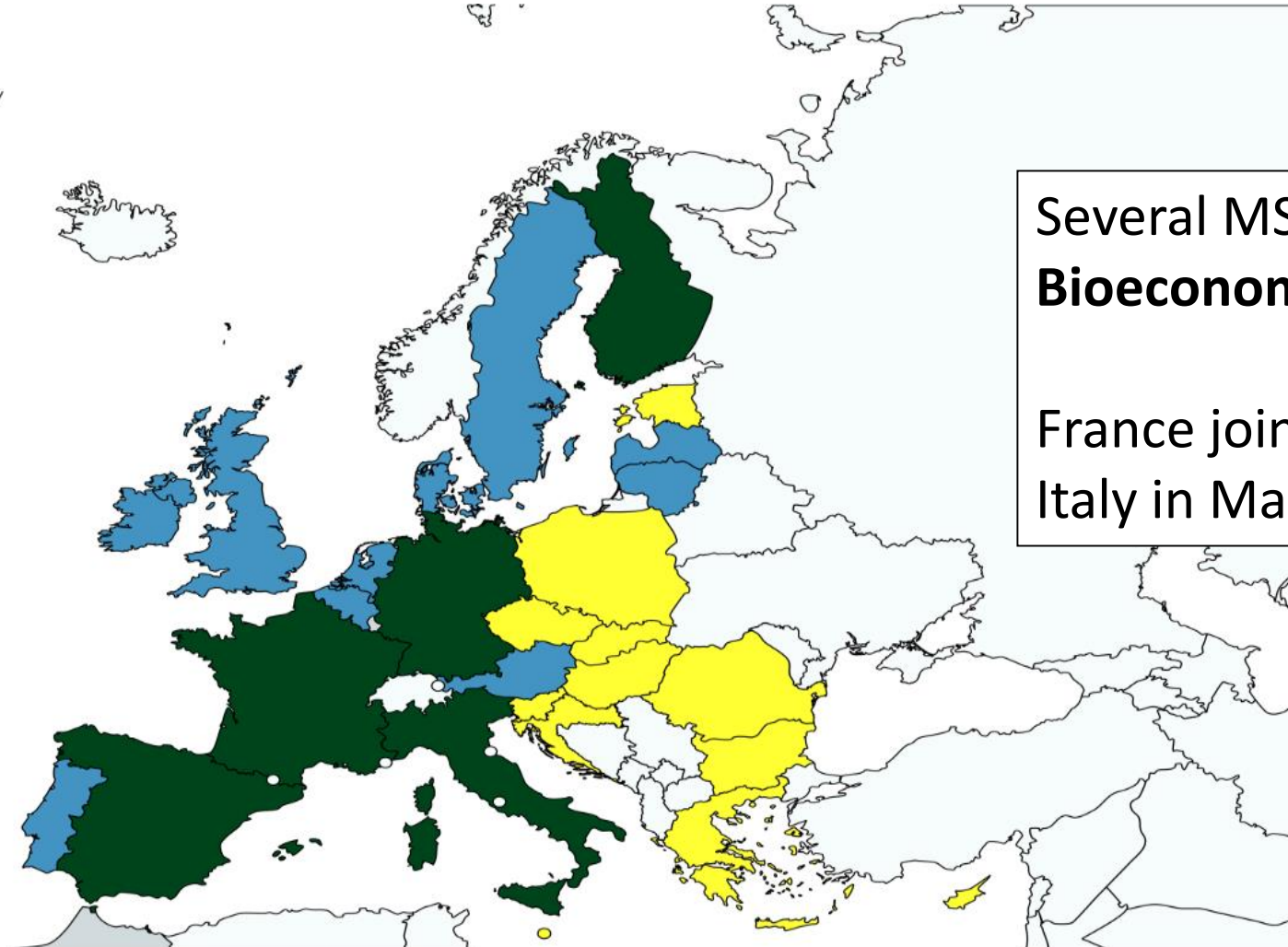




# A Bioeconomy strategy for Europe 2012

## Europe of bioeconomies

- National Bioeconomy Strategy
- National Bioeconomy related policies
- Bioeconomy related initiatives
- Non-EU countries



Several MS have adopted **national Bioeconomy Strategies**.

France joined in February 2017  
Italy in March 2017



## BBi JU was part of EU Bioeconomy strategy in 2012

European public-private partnership (iPPP) was needed to:

- **De-risk** investments;
- **Organize** the value chains;
- Reach **critical mass** of this “emerging” sector



## About BBI JU



- Public-Private Partnership (PPP) between European Commission & BIC supporting R&I for bio-based industries
  - BBI JU Budget: € 3.7 billion (25% EU - 75% BIC)
- Fund R&I projects from technology development to full scale

Multidisciplinary Programme office

EU body - operates under Horizon 2020 rules

### BBI JU Mission

Implement under Horizon 2020 rules, the Strategic Innovation and Research Agenda (SIRA) developed by the Bio-based Industry Consortium (BIC)



# BBi JU objectives

400.000 skilled jobs by 2020  
rising to 700.000 skilled jobs by 2030



80% of which will be in rural areas

Develop sustainable and competitive bio-based industries in Europe, based on advanced biorefineries that source their biomass sustainably by:

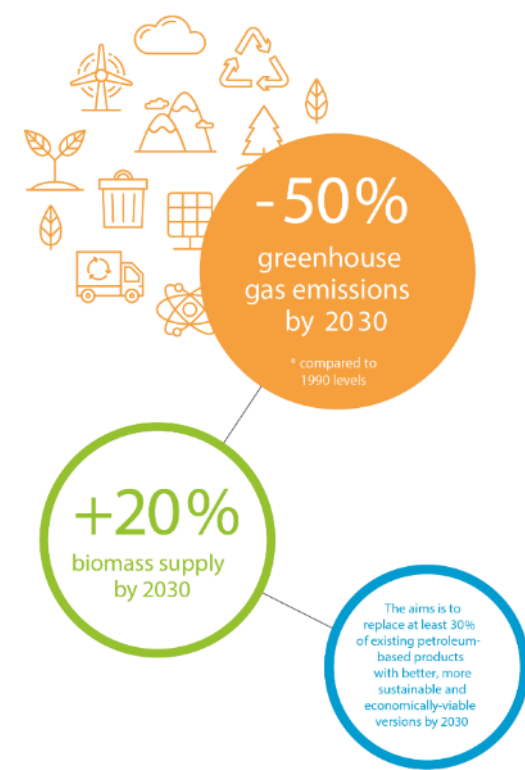
1. **Demonstrating new technologies** to fill the gap in value chains
2. **Developing business models** integrating all economic actors along the value chain
3. **Set-up flagship biorefinery plants** deploying business models & technologies to keep investment in EU





# Expected impact for Europe by 2030

- Replace 25% of oil-based chemicals
- 10 times more bio-based materials
- Increase biomass supply by 20%
- Increase by 25% mobilisation of unused sources
- Develop potential of agro-food “waste” & forestry residues
- Diversify and grow farmers’ revenues
- Create 700,000 jobs – 80% in rural areas
- Reduce EU’s dependency on import of fossil raw materials, protein (- 50%) and P – K (- 25%)
- Shift to bio-based economy → average 50% GHG emission reduction



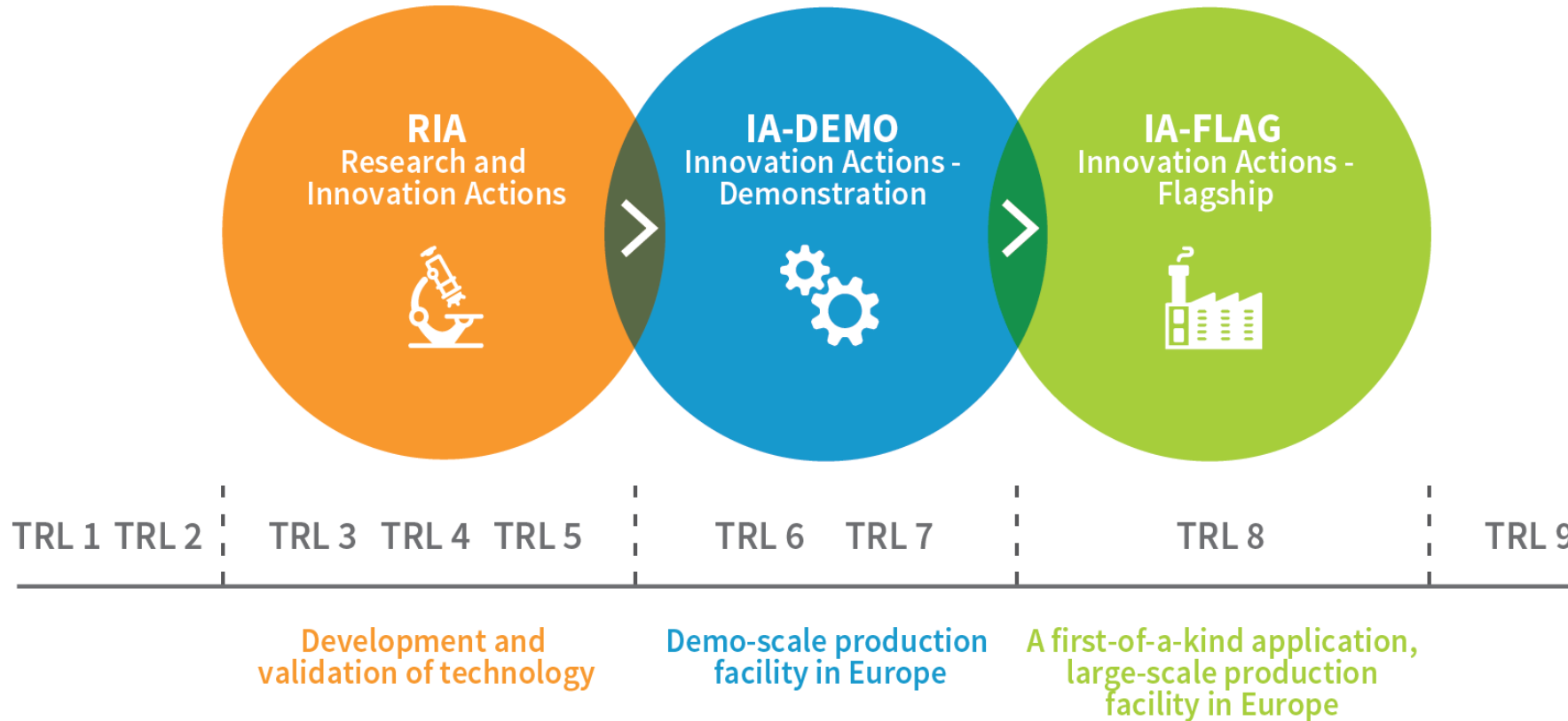


## BBI JU's target for a sustainable bio-based industry thanks to focus on:

- LCAnalysis for each project
- Waste valorisation (industry, agriculture and municipalities)
- Reconversion of marginal lands and semi-arid areas
- Increase productivity of industrial multipurpose crops
- New feedstock supply chains: ligno-cellulosic residues from agriculture and forestry residues
- Protein, P & K recovery
- Reduction of fertilisers input while increasing crop yield
- Biodiversity – Water management – soil preservation



# BBI JU funds collaborative industry driven actions



**CSA**

Coordination and Support Actions - no link to TRLs\*

\*TRL = Technology Readiness Levels



# Participation & funding rates per action

Type of participant	RIA	IA Demo - Flag	CSA
Large Industries	/	70%	/
SMEs	100%	70%	100%
Universities	100%	100%	100%
RTOs – non profit, legal entities	100%	100%	100%
Duration	3 – 5 years	4 – 5 years	1 – 3 years





# BBi JU objectives implementation

## Strategic level: SIRA

Strategic Innovation and Research Agenda  
guiding document developed by BIC



## Operational Level Annual Work Plan

Drafting – Approval – Supporting



Consultation

BBi JU Scientific Committee States Representatives Group



Call for proposals  
(RIAs, IAs, CSAs)

Project management  
Reporting - monitoring



- ✓ Publication
- ✓ Evaluation
- ✓ GAP





# SIRA 2017

## SO 1

**Foster Supply of sustainable biomass feedstock to feed both existing and new value chains**

- Agri-based feedstock
- Forest-based feedstock
- Aquatic feedstock
- Bio-waste and CO<sub>2</sub>

## SO 2

**Optimise efficient processing for integrated biorefineries through R&D&I**

- Pre-treatment
- Conversion of pre-treated feedstocks to biobased chemicals and materials
- Downstream processing
- System modelling

## SO 3

**Develop innovative bio-based products for identified market applications**

- Drop-in bio-based products
- Bio-based products that outperform fossil-based counterparts
- New breakthrough chemicals
- Proteins and active ingredients

## SO 4

**Create and accelerate the market uptake of bio-based products and applications**

- Policy & regulations, standardization
- Consumer awareness of the benefits of bio-based products
- Knowledge gathering and networking



# Calls 2014-2017

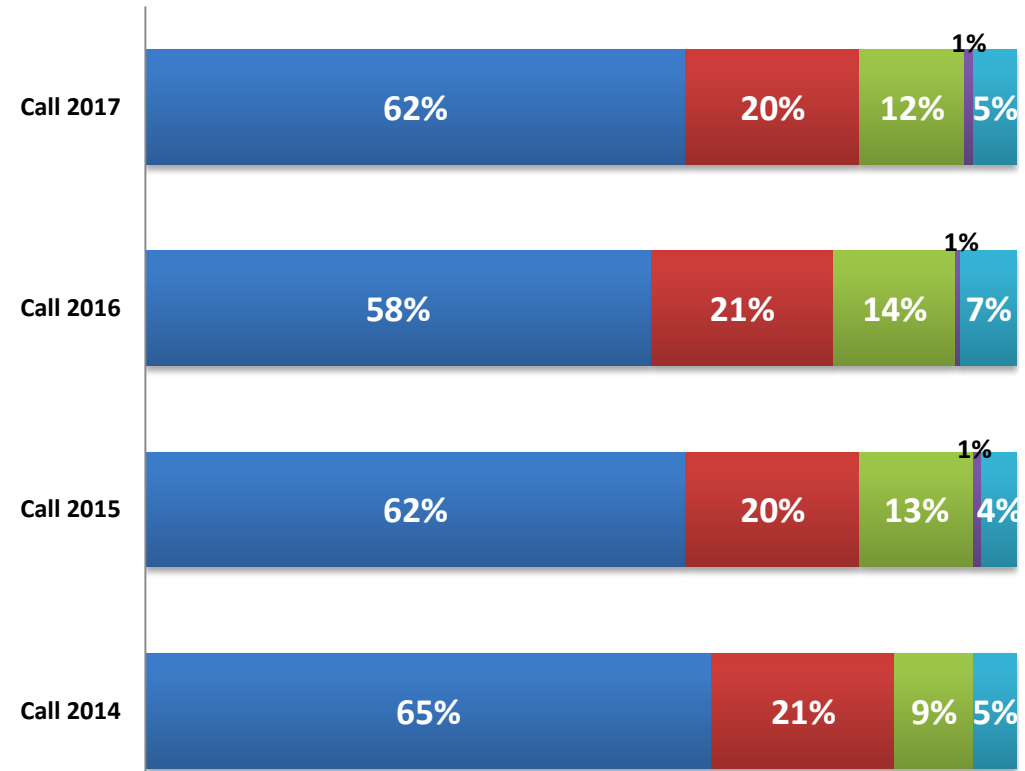
## Type of organisations in funded projects

82 running projects

923 beneficiaries

€ 794 m grant

Private for-profit entities (excluding Higher or Secondary Education Establishments)
Research Organisations
Higher or Secondary Education Establishments
Other <ul style="list-style-type: none"><li>• private not for profit entities</li><li>• international organisation (or international organisation of European interest)</li><li>• natural person</li><li>• entities without legal personality</li></ul>
Public Organisation





# BBI JU project portfolio

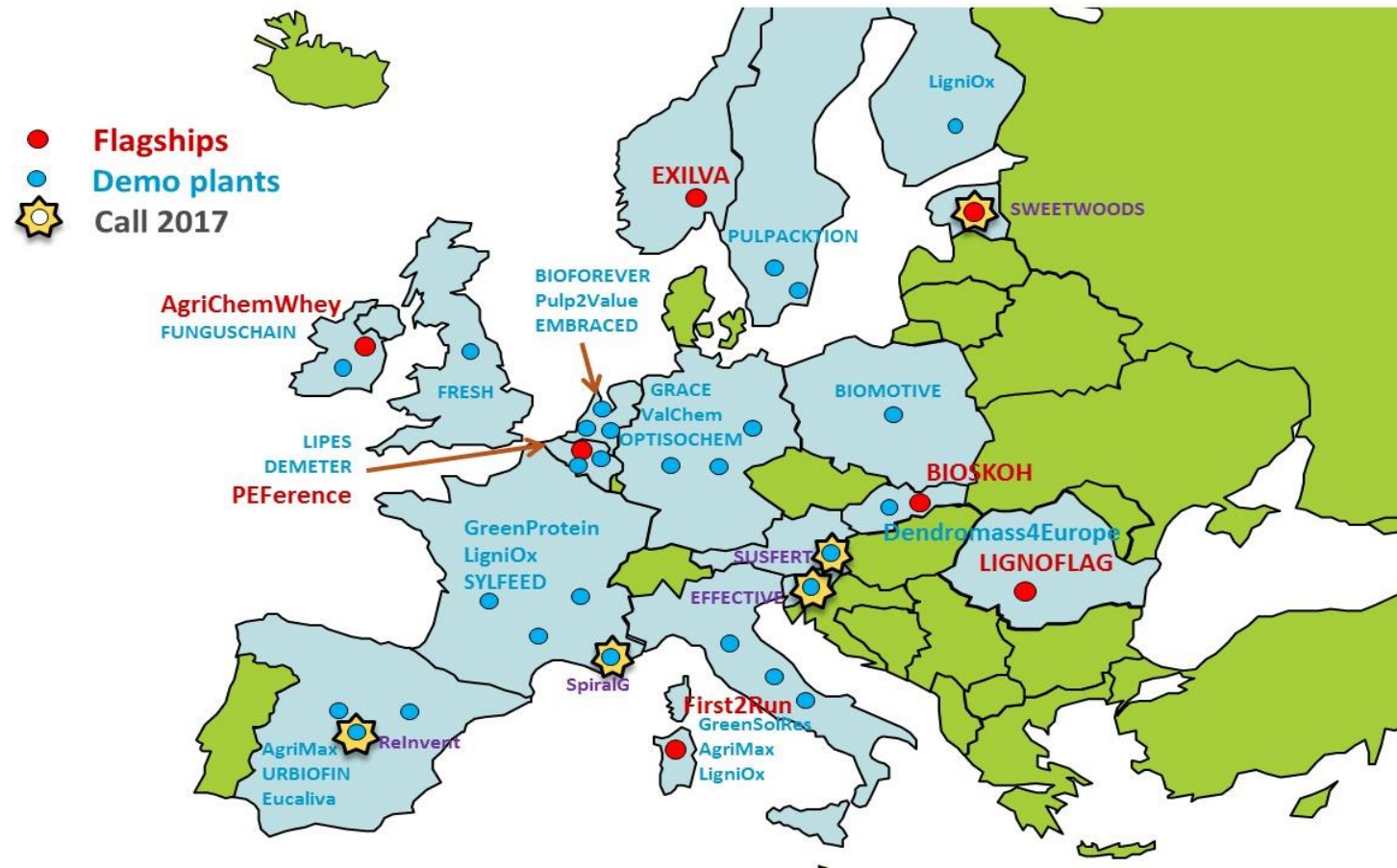
## SO1& SO4

Calls **2014** + **2015** + **2016** + **2017**

SO1: Feedstock	RIA	DEMO	Flagship
Agri-based	Carbosurf, PROMINENT, LIBBIO, HYPERBIOCOAT, Zelcor, BIOrescue BioBarr, SSUCHY, CASPER, Pro-Enrich, Prolific, EXCornsEED	Pulp2Value, AgriMax, Funguschain, GreenProtein, LIPES, GRACE, LigniOx SUSFERT	FIRST2RUN, LIGNOFLAG AgriChemWhey, PEference
Forest based	SmartLi, Greenlight, PROVIDES, US4GREENCHEM NeoCel, LIBRE, TECH4EFFECT, EFFORTE, SHERPACK SusBind, WoodZymes	ValChem, BIOFOREVER, GreenSolRes, PULPACKTION, FRESH, Dendromass4Europe SYLFEED, EUCALIVA	BIOSKOH, EXILVA SWEETWOOD
Bio-waste and CO <sub>2</sub>	NewFert, AFTERLIFE, PERCAL, BARBARA	EMBRACED, URBIOFIN, DEMETER	
Aquatic Biomass	MACROCASCADE, BIOSEA, ABACUS, MAGNIFICENT, VALUEMAG	SpiralG	
Different sources of biomass	EnzOx2, InDIRECT, ReSolve, BIOSMART, ECOXY, REFUCOAT, POLYBIOSKIN VIPRISCAR, AQUABIOPROFIT, iFermenter, UNRAVEL	OPTISOICHEM, BIOMOTIVE EFFECTIVE Reinvent	
SO4: Facilitation of market uptake		CSA	
Policy, regulations & standardization		STAR4BBI	
Consumer awareness of the benefits of the bio-based products		BioCannDo, BIOWAYS BIOBRIDGES	
Knowledge gathering and networking		BIOOPEN, Pilots4U, RoadToBio ICT-BIOCHAIN	



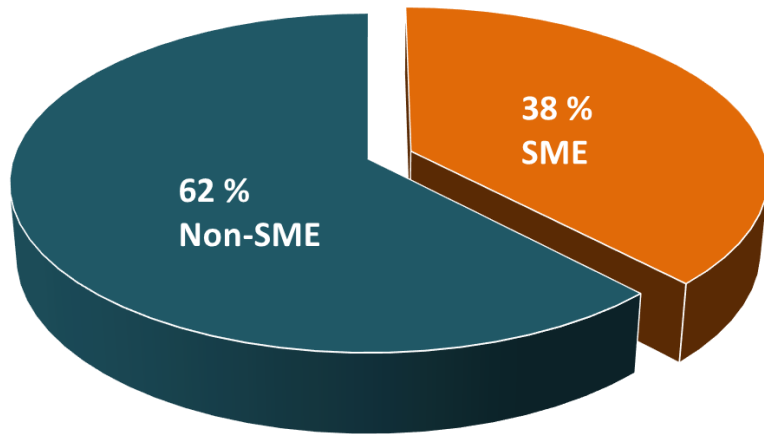
# BBI JU project portfolio: geographical coverage of DEMOs and FLAGHIPS



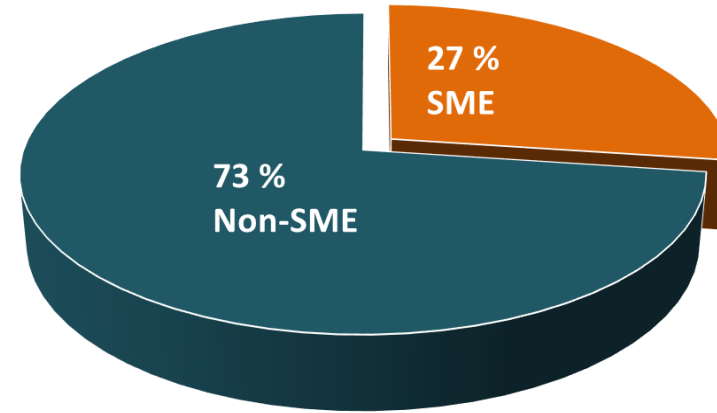
Analysis of geographic coverage of other types of action ongoing.



# SME participation in BBI JU Call 2014-2017



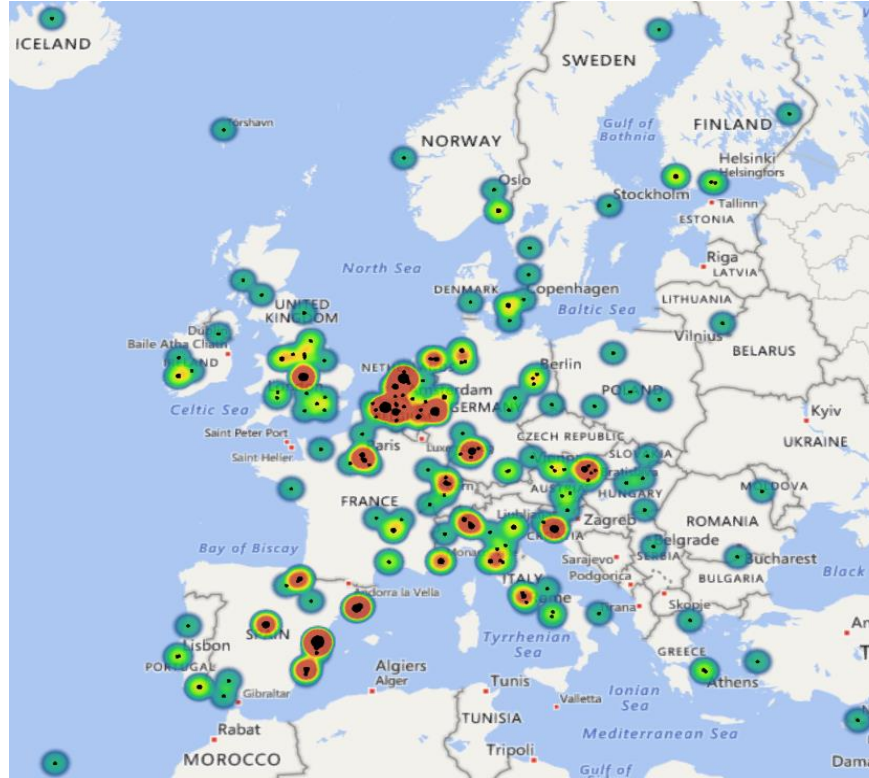
**% SME in retained proposals in Calls 2014 – 2017**



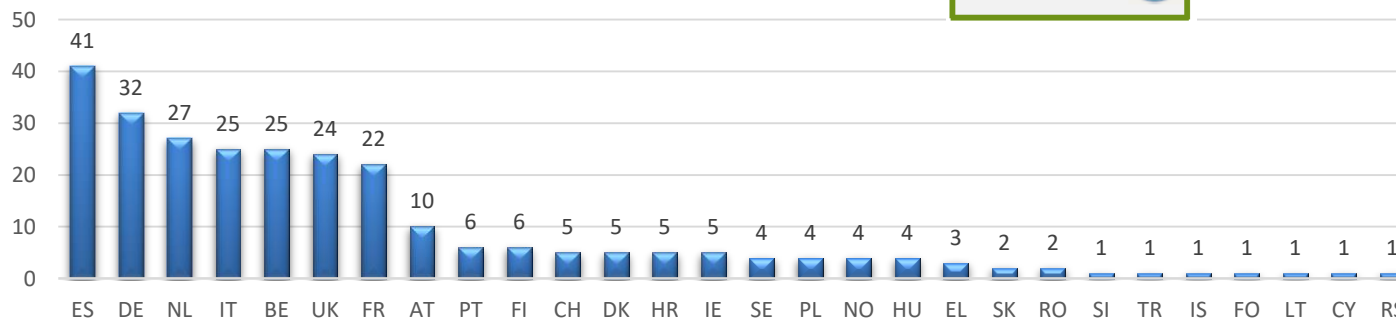
**% SMEs funding Calls 2014 – 2017**

# SME beneficiaries

## Geographical distribution



- Wide geographical coverage: majority of MS have SMEs participation
- Intense mobilisation in Western Europe: DE, BE, FR, AT, CH, NL, UK as well as in certain countries in the Mediterranean Region





# BBI JU achievements

- BBI is achieving its objectives with two main effects\*:
  1. Structuring effect
  2. Mobilizing effect
- Increasing mobilisation in BBI calls
- Optimal Value Chains coverage
- Demonstration and Flagships
- New types of collaboration
- High % of SME participation
- Growing BBI JU awareness (also outside EU)
- The industry invest massively 2014: €2bn → 2017: €5bn
- Europe back on the map

(\*) More information: BBI JU interim evaluation report



## Future priorities

- Farmer organisations participation
  - Municipal bio-waste
  - BBI JU widening participation strategy
  - More emphasis on aquatic biomass
  - Increase « brand owners » participation
  - Better communication value for EU citizens
  - Engage more with young scientists
  - More digitalisation
- 
- Adjusted SIRA June 2017
  - Bioeconomy strategy update
  - New missions for HORIZON EUROPE (FP9)



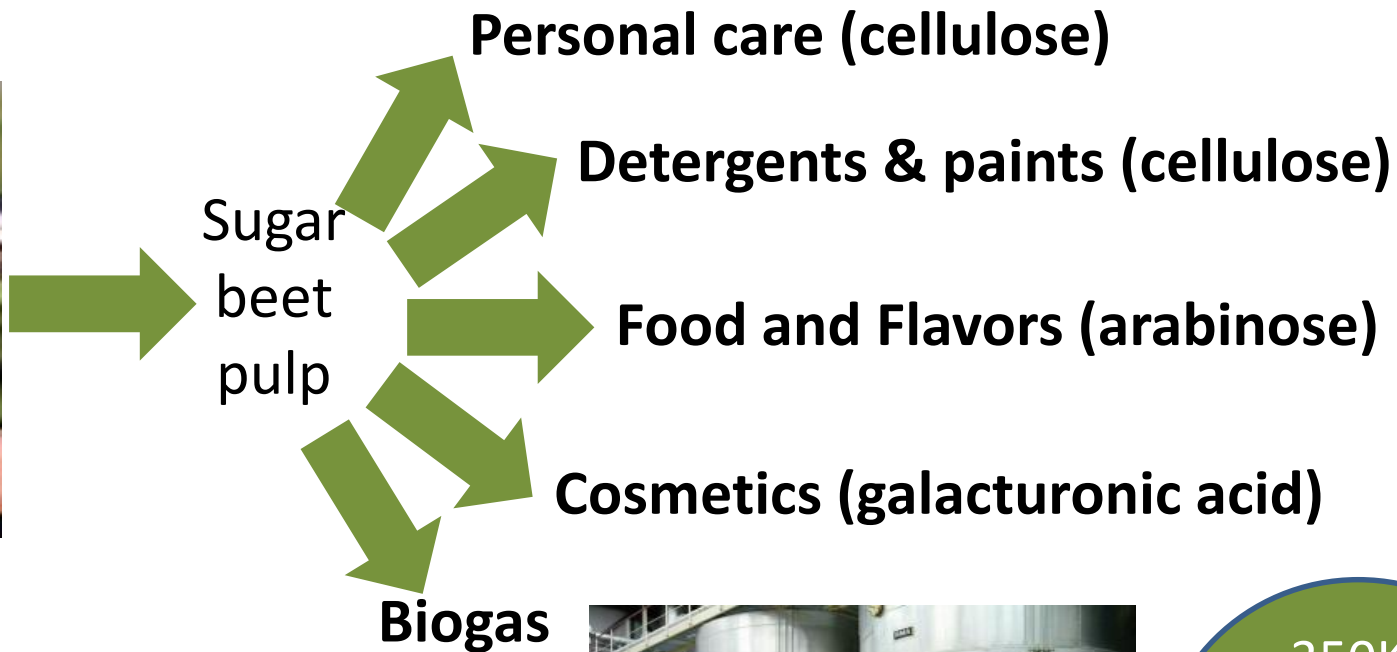


# PULP2VALUE

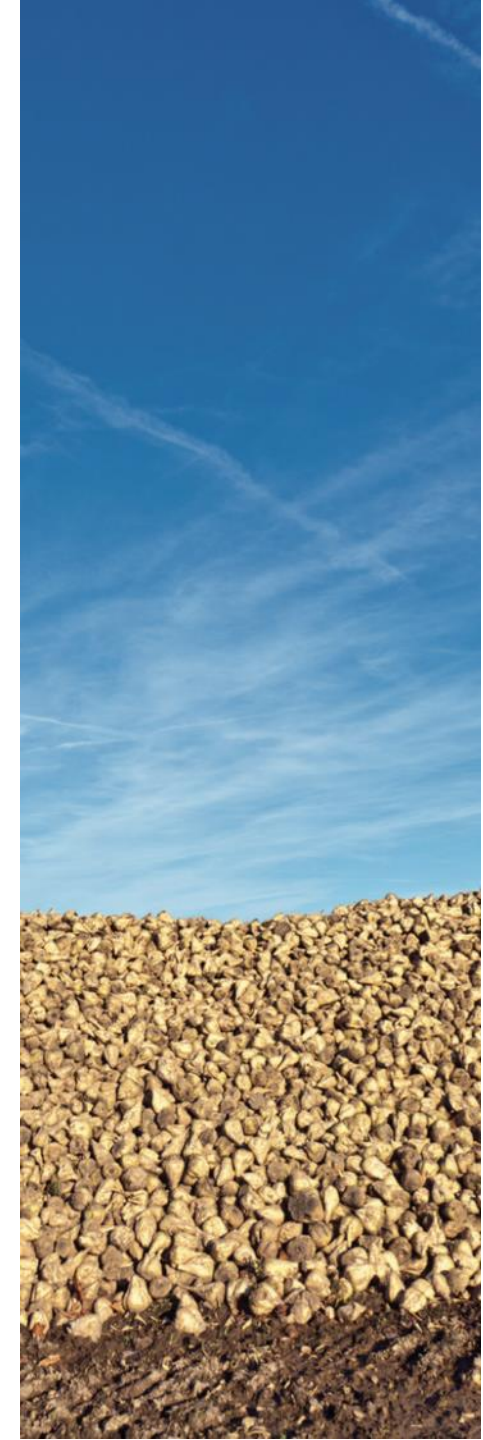
May 2016

## Demonstration project

Coordinator - Royal Cosun - Netherlands



350KT  
€200M  
7 Value Chains  
Reduced GHG







# First 2 Run

July 2015

## Flagship project

Coordinator - Novamont - Italy



Marginal  
land  
Brownfield

- New value chains
- Reuse of defunct Industrial site



Organic  
acids

- Polymers  
bioplastic
- Lubricants
- Cosmetics

Valorize  
co-roducts

- Energy
- Feed





# EXILVA

May 2016

## Flagship industrial project

Coordinator - Borregaard Norway

- **Nanocellulose at industrial scale** - Microfibrilated cellulose (MFC)
- **Sector:** Home and personal care, adhesives, agrochemicals, detergents, coatings



- **Challenges:**
  - Processing of wood into MFC
  - Operation of world's first MFC industrial plant (2000 tons/year)





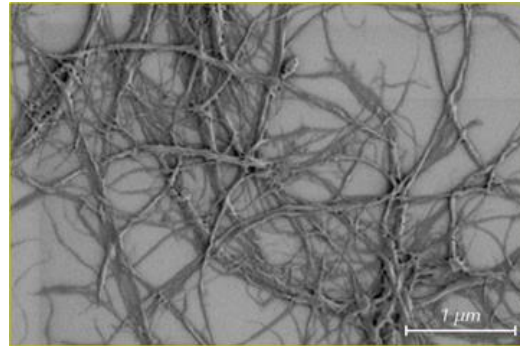
# EXILVA

May 2016

**Flagship industrial project**  
Coordinator - Borregaard Norway

- **Challenges:**

- Characterization of MFC and understanding its behavior



- Developing standards for MFC for customers and regulators
- Sustainable production - LCA including sLCA (reduced CO<sub>2</sub>)

- **Benefits:** Sustainable biobased materials, added value to biomass producer and creation of skilled jobs



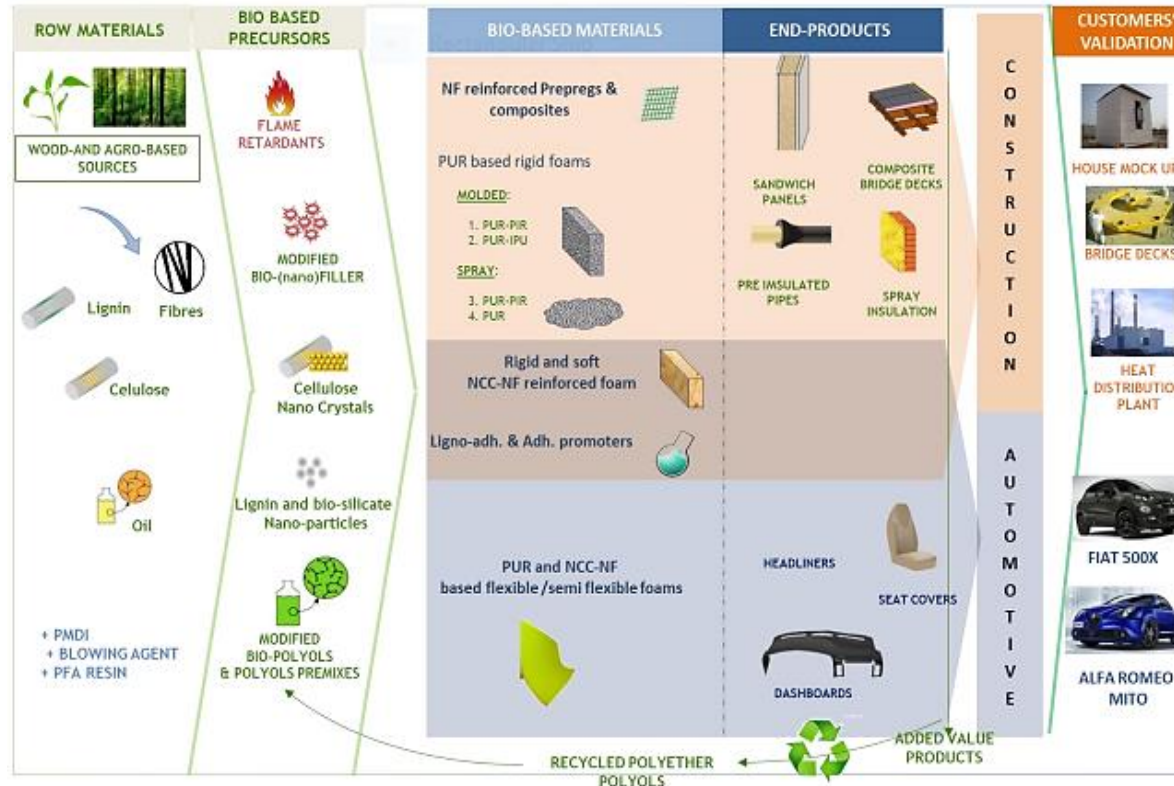


# ReInvent

## Demonstration project

Coordinator - FIAT Research Center – Italy

Replace petroleum based polyurethane (PUR) insulation products used in construction and automotive



## CONSTRUCTION

**Final products:** composite bridge decks, spraying building insulations and insulating sandwich structures

**New functionalities:** lightweight, flame retardancy, noise insulation, hydrophobicity and thermostability, antifungal and anti-rotting

## AUTOMOTIVE

**Final products:** Seat covers, dashboards, headseats

**New functionalities:** fatigue resistance, softness at low temperatures, flame retardancy, noise insulation, hydrophobicity and thermostability, antifungal and anti-rotting



# AgriChemWhey

Flagship industrial project

Coordinator - Glanbia Ireland

Jan 2018

**Dairy Side streams to biobased chemicals and polymers**

## **Markets**

Food and Feed ingredients, cosmetics, Bioplastics

## **Challenge**

Industrial scale biotechnology using a variable side stream

## **Benefit**

Farmer co-op innovation  
Creating a new value chain  
Industrial symbiosis











# Join us!

Register on our web site

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-  [www.bbi-europe.eu](http://www.bbi-europe.eu)

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**Merci**