



SHAPING THE BIO-BASED BIOECONOMY  
AS ONE OF THE MOST POWERFUL  
TOOLS FOR SUSTAINABLE  
DEVELOPMENT

# Lombardy Green Chemistry Association

La piattaforma S3 per la chimica e le opportunità dell'Unione  
Europea per le imprese lombarde

Assolombarda, Milano  
27 Gennaio 2020



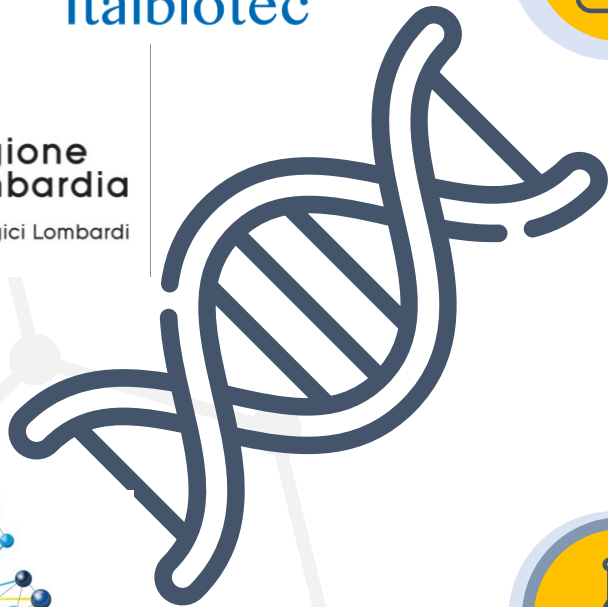
Regione  
Lombardia

Cluster Tecnologici Lombardi

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# Lombardy Green Chemistry Key data

Founded in 2013, the Lombardy Green Chemistry Association is one of the Leading-Edge Cluster of the Lombardy Region.



Founded in 2013 by Consorzio Italtotec, the Italian leading no-profit organization on biotechnology sector together with other public and private R&D institutions



Recognised in 2015 by the Lombardy Region as the regional Cluster of Bioeconomy and Green Chemistry



Since 2016 technical coordinator of the Bioeconomy Pilot of the Vanguard Initiative



**VANGUARD INITIATIVE**  
NEW GROWTH THROUGH SMART SPECIALISATION

# Our contribution to green acceleration

LGCA supports industrial research and innovation encouraging private-public partnership to address the societal challenges and promote the circular bioeconomy growth.

## **POLICIES DEVELOPMENT AND GOVERNANCE ACTION PLAN DESIGN**

To promote the establishment of a regional bioeconomy supporting the Smart Specialization Strategy implementation .

## **BUSINESS DEVELOPMENT AND MARKET UPTAKE**

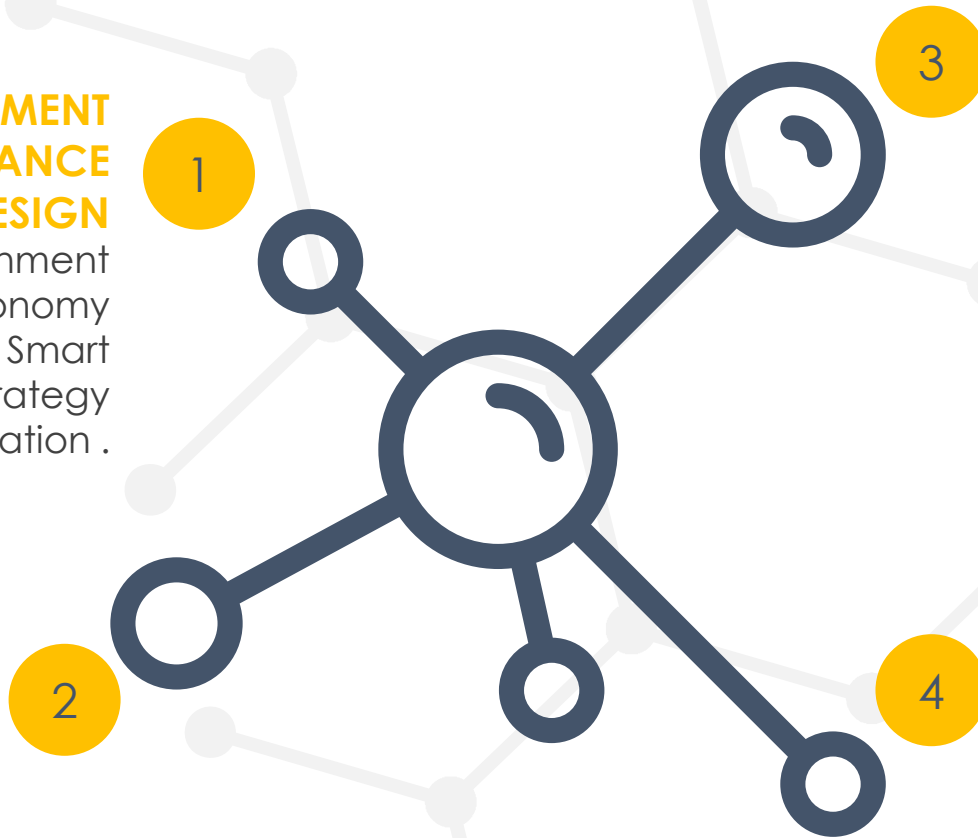
To encourage the cross-regional cooperation to bioeconomy and circular economy sectors and supporting business cases creation.

## **KNOWLEDGE TRANSFER AND NEW BUSINESS OPPORTUNITIES CREATION**

To combine the expertise of more than 65 actors covering the local network of the bioeconomy and the entire innovation chain.

## **NETWORKING & CONSORTIA BUILDING**

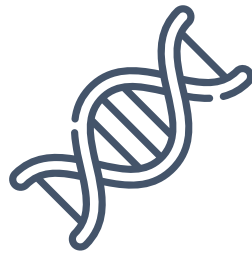
To increase the internationalization of the industrial companies, universities and research institutes



# LGCA in a glance

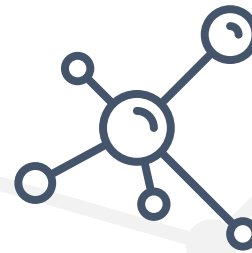
LGCA encourages the use of renewable biological resources to produce food, feed, energy by using cross-cutting technologies and promoting sector application such as bioenergetics, eco-construction, paper industry, phytopharmaceutical industry, waste management, biotechnologies, biochemistry, biopolymers, etc

**52 members**



- 27 SMEs
- 7 Big industries
- 6 NGOs
- 6 Universities
- 6 Research Institutes

**4 value chains**



- AGROFOOD
- GREEN CHEMISTRY
- FOOD/PHARMA
- WOOD

**50+ R&D projects**



- European, national and regional funded projects on bioeconomy, circular economy fields.
- 65% beyond TRL 6 with validation of pilot plan at industrial level

# Areas of LGCA activities

LGCA mission is to accelerate the innovation and market uptake of bio-based products, promote the competitive bio-based economy and encourage the production of chemicals, materials and advanced biofuels from renewable biological resources.

## **CIRCULAR BIOECONOMY & BIOECONOMY MANAGEMENT**

Promote the bio-based products market uptake, the implement policies tools, education and training



## **BIOREFINERY & ADVANCED BIOFUELS**

Creating biorefineries for the integrated production of value-added products from no food crops and waste biomass

## **GREEN CHEMISTRY**

Products and processes for replacing and / or reducing the use of rare, toxic and polluting substances and reducing energy consumption



## **NEW BIO-BASED PRODUCTS**

Applications of synthetic and systemic biology for the bioeconomy

# Interregional cooperation on bioeconomy

The Bioeconomy Pilot of Vanguard Initiative: Interregional cooperation on innovative use of non-food Biomass



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NEW GROWTH THROUGH SMART SPECIALISATION

## Bioeconomy - Interregional cooperation on innovative use of non-food Biomass

Led by **Lombardy (IT)** and **Randstad (NL)**, the partnership engages the participation of

**25** Regions and Member States



- To support the **creation of new integral bio-based value chains** and connections between chemistry, agro-food, bioenergy, biofuels sectors
- To promote **new business opportunities** through interregional cooperation and exchange of information and ideas
- To foster projects at the demonstration stage towards their **upgrading and business exploitation** (beyond TRL 5).
- To promote **investment pipelines based on industry-driven business cases** consistent with the smart specialisation strategies of the participating regions.

# The bioeconomy Pilot demo-cases

New bio-based chemicals and biofuels pilot plants

## Bioaromatics demo-case

Creating interregional value chains to produce lignin-based aromatic molecules and innovative sustainable materials.

### Use-cases:

- **Sugar to bio-aromatics.** Sugar-line based on furan and Diels-Alder chemistry: leading to functionalized furans and aromatics
- **Lignin to bio-aromatics** (lignoValue plant). Lignin line based on depolymerisation, fractionation, conversion: leading to innovative functionalized molecules
- **Thermochemical conversion** of biomass to bio-aromatics: leading mostly to bio-based BTX molecules

## Lignocellulosic demo-case

Set-up of European value chains from lignocellulose biomass to intermediate and end-products of bulk and fine chemicals.

### Use-cases:

- **Large-scale biorefinery**, the "Redefinery project" focused on the production of sugar from cellulose and hemicellulose plus sustainable bio-asphalt from lignin (stemming from hardwood chip/pellets as feedstock).
- **Softwood-based biorefinery** focused on the production of mixed sugars and panel form lignin (softwood as feedstock)
- **Local4Local biorefinery**, based on small-medium biorefinery of wood, with cellulose to fiber and syngas production from the hemicellulose/lignin fraction.

## Liquified Bio-methane demo-case

Enhance wide diffusion of bio liquified natural gas for sustainable transport across Europe, by advancing the state of the art of biogas upgrading.

### Use-cases:

- **Liquified Bio-methane - LNG Blue Corridor** focused on enhancing a wide diffusion bio-LNG for public transport mobility
- **SMBio-LNG Shaping the future of Sustainable Mobility** aiming at deploying a sustainable supply chain of liquefied biomethane for heavy vehicles mobility

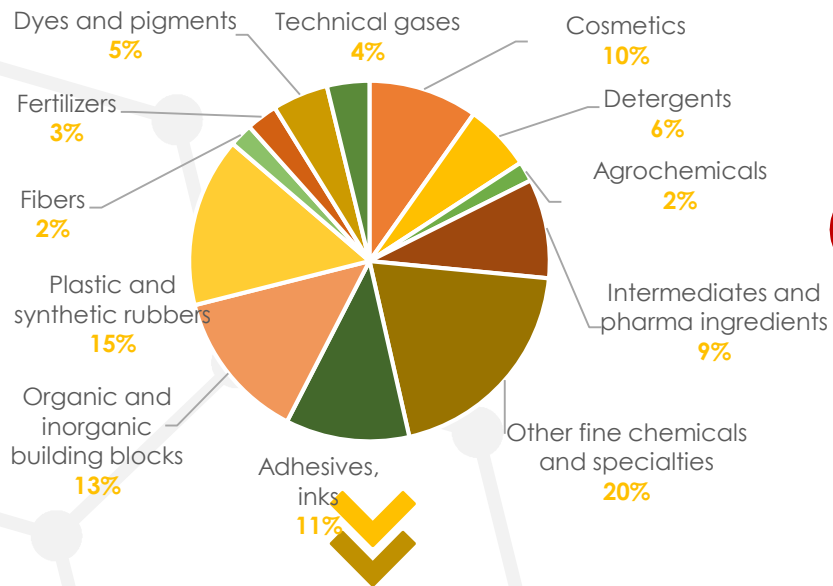
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2019

# Bioeconomy as driver for regional growth

In Italy, there are relevant chemical poles in different regions. The chemical industry in Northern Italy is very significant, where 78% of sectoral employment is concentrated, in particular in Lombardy, which has the highest specialization index, even higher than sectors considered typical of the local industry such as mechanics.

## Chemical production in Italy by sector

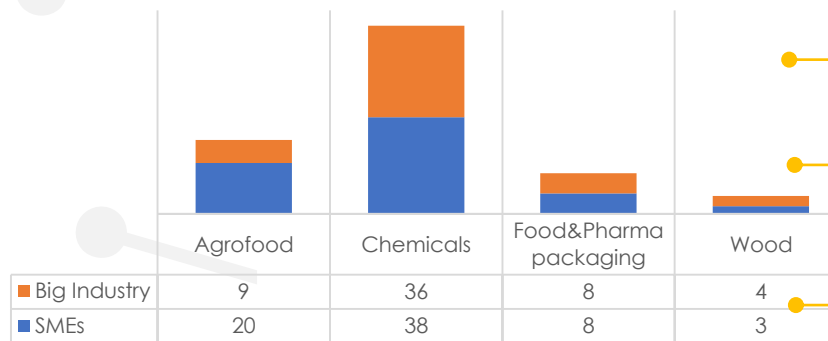


### Quote of Lombardy on Italy%

	Total chemical sector
Enterprises	20,5%
Employees	24,3%

## Bio-based Lombard ecosystem

200 industrial firms operating in bio-based sector



**9,5% BIOENERGY & BIOBASED PRODUCTS** – Biofuels and biorefinery starting from raw materials, fertilizers, agro and urban waste treatment

**42% FINE CHEMICALS, FOOD&PHARMA PACKAGING** – Pharma intermediates, green textile printing technologies, ingredients, cosmetics

**6,3% BIOPLASTICS and BIOPOLYMERS** starting from raw materials

**26,1% BULK CHEMICALS** – oil lubricants, resins, solvents, additives, adhesives

**12% AGROFOOD**, Sustainable food production

**0,4% PULP & PAPER INDUSTRIES**

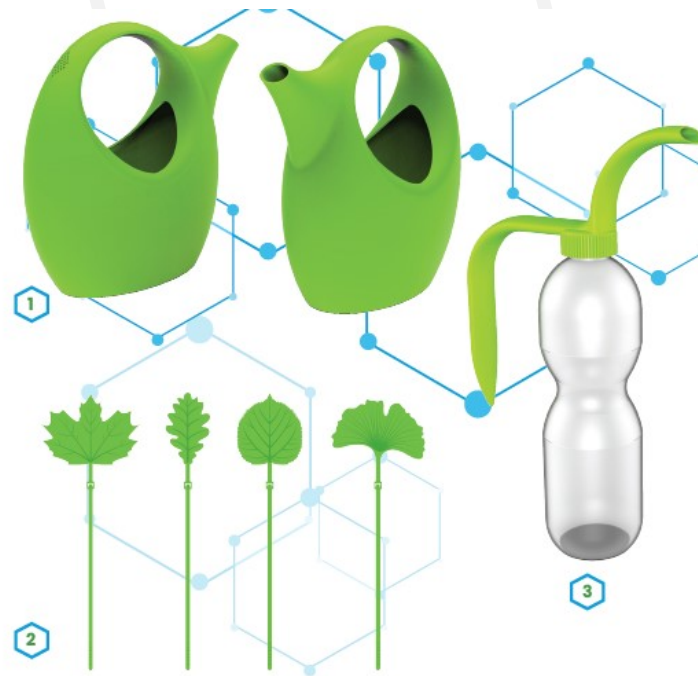


# Towards a circular bioeconomy for the Lombardy Region

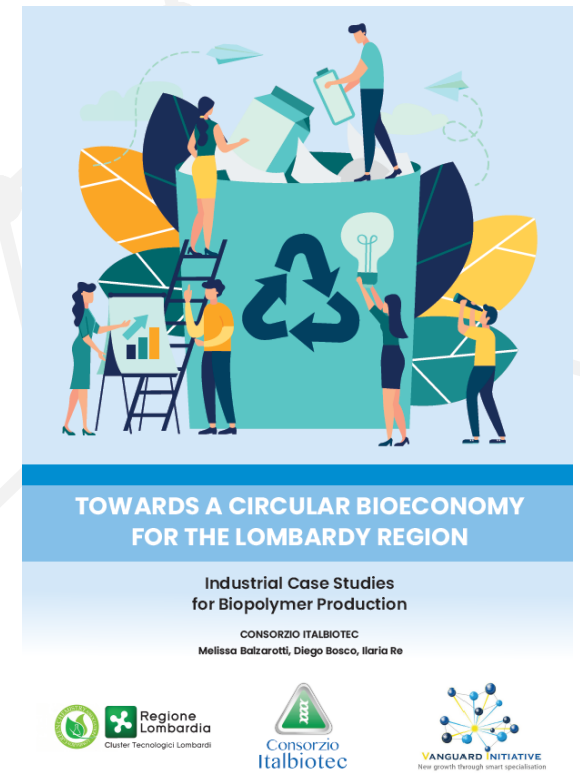
Industrial case studies for the Lombardy Region.

In the field of biopolymers production, the Bioeconomy Pilot has designed and developed a market analysis focused on creating a new promising partnership across the Vanguard regions.

A number of regional and European success stories have been analyzed and several use-cases were identified.



PHA applications tested in PHA STAR project, funded by the Lombardy Region



# SMBio-LNG Shaping the future of Sustainable Mobility

A new Bioeconomy Pilot use-case for creating a logistics system in Europe with low environmental impact



SMBio-LNG belongs to the Bioeconomy reality to the S3P-Industry thematic area, as industrial use-case of the Bioeconomy Pilot of the Vanguard Initiative.

The project aims to deploy a sustainable supply chain of liquefied biomethane from renewable sources, such as animal manure and agricultural production waste, and promote the increase of several bio-LNG refueling stations across Europe.

The project, thanks to the TAF applications, created the opportunity to work with companies, corporate finance experts and legal experts from leading corporate consulting companies to improve the business plan.



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Many thanks!

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