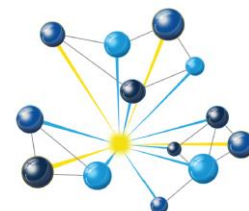


# Vanguard initiative. New Growth Through Smart Specialisation

The Bioeconomy Pilot and  
Lombard bio-based industry stats.

**BOSTING INNOVATION FOR EU INDUSTRY:  
Industrial Infrastructures & Open Innovation Ecosystems**  
Ljubljana, 3rd April 2019

Ilaria Re  
Lombardy Green Chemistry Association



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# The Bioeconomy Pilot



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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



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



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# The demo-cases of the Bioeconomy Pilot

## Bio-aromatics

Creating interregional value chains to produce biobased aromatic molecules and innovative sustainable materials.

20  
regions

Leader: Vito (Flanders)  
Co-leader: South Netherlands, North-Rhine Westphalia

Thermochemical processes:  
leading to bio-based BTX molecules

Sugar-line based on furan chemistry:  
leading to functionalized furans and aromatics

Lignin-line based on depolymerisation:  
leading to innovative functionalized molecules

## Lignocellulosic biorefinery

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

6  
regions

Leader: Biobased Delta (Zuid-Holland)  
Co-leader: Scotland, Wales, Flanders

Valorisation of lignocellulosic value streams to high-value products such as fine and specialty chemicals

Mixed C5/C6 cellulosic sugars conversion to bioethanol

Selection sustainable route for bio-based bulks, such as bio-bitumen, fuels ...

## Advanced and sustainable biofuel

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

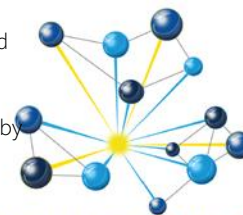
6  
regions

Leader: ASTER (Emilia-Romagna)  
Co-leader: Lombardy

Enhance a wide diffusion bio-LNG at VI level

Increase competitiveness of industry and local biomass producers

Promoting renewable fuel consumption by use of bio-LNG



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# Demo-cases relevant achievements

## Bio-aromatics

Improve proprieties of lignin side stream

- Thermal treatment method applied to black liquor ready for upscaling to demonstration level
- LignoValue pilot plant to depolymerise lignin into bioaromatics is approved and will be working by 2020
- Full lignin-applications lab is installed
- Selection of the most promising value chains: Over all lignocellulose biorefinery Sugar + lignin, Natural lignin to cosmetics & fragrances, Lignin to glues and adhesives ...

## Lignocellulosic biorefinery

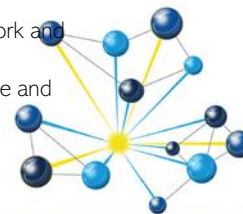
Selection of most interesting value chains

- softwood to cellulosic sugars for bioethanol, with lignin to energy
- hardwood to C6 sugars for chemicals, C5/C6 to bioethanol and lignin to bio-bitumen
- a forest driven comprehensive proposal with follow-up to select the most appropriate routes and products

## Advanced and sustainable biofuel

Identification of the optimal biomass value chain to valorize

- Pilot Identification
  - BIO-LNG PRODUCTION 1 demo site: (municipal waste organic fraction)
  - BIO-LNG DISTRIBUTION 3 locations: Bologna; Piacenza; Parma
- Establishment of a regional biogas network and exploring the possibilities of supply and investments for decentralized biomethane and bio-LNG production



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# Bioeconomy in Lombardy: an integrated ecosystem



10,000  
businesses  
20% of  
national total



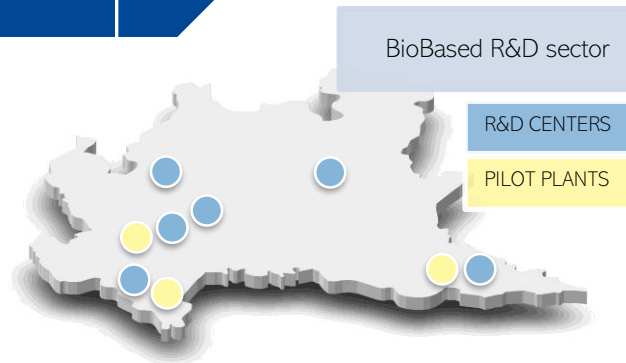
84,000  
workers  
20% of  
national total



50 billion  
turnover  
25% of  
national total



Source: Camera di Commercio di Milano, dati 1st quarter 2018 and Greening the Jobs, ILO 2018



Source: elab. LGCA 2018 and BIT Bioeconomy in Italy

- Biofuels and biomethane production from agro/urban waste
- Biolubricants
- Green chemistry, fine & bulk chemical, process engineering
- Biomass, biowaste conversion in energy, nutrients, fertilizers (Pavia)
- Pharmaceuticals Feed & Food ingredients (Milano, Lodi)
- Biobased butadiene (Mantova)
- Biomaterials from mycelia (Varese)
- Biobased coatings and textile (Milano, Como)



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# Industry-driven Open Innovation hubs



Agrifood

- **+10,7% of the regional GDP** (13,5% of national DDP)
- **60.000 productive units** and 225,000 workers



Chemicals

- 1,096 local units
- 46,016 employees
- **28,4 billion turnover**
- Value added 4,1 billion



Pharma

- **258 local units**
- 23,775 employees
- **12,3 billion turnover**
- Value added 3,4 billion

- 30 SMES and large industries,
  - 9 universities / research centers
  - 6 industry associations
- are currently members of the Lombardy Green Chemistry cluster

Source: Assolombarda, Federchimica, The Chemical and Pharmaceutical Industry In Lombardy – 2016

Source: Lombardy Region, The agrif-ood lombardy system – 2018



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# Lombardy biotechnology industry hubs

## Bioenergy

In Lombardy, the agricultural biogas sector includes over **300 plants** with an installed capacity of over 250 MW. 1.6 billion euros of investments, 300 million euros per year for maintenance

## Food ingredients

In the fine chemicals sector, in Lombardy over 50 companies are operating for the production of active and functional ingredients.

## Nutraceutical & Cosmetics

The technological hub of cosmetics more than 60 companies, concentrated in the Crema area, with an aggregate turnover of around 600 million euros and more than 2,500 employees.



EnerTech



ROELMI•HPC  
Health & Personal Care

PROBIOTIC  
CGB  
nutraceuticals and  
nutrigenetics



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Source: Consorzio italiano Biogas, Polo della Cosmesi – 2018

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# THANKS!

**Any questions?**  
You can find me at  
[ilaria.re@italbiotec.it](mailto:ilaria.re@italbiotec.it)



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