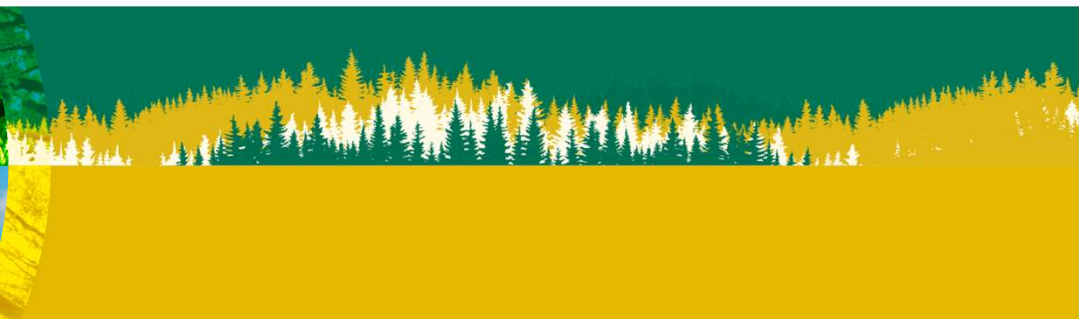


IEA Bioenergy

Task42 Biorefining in a  
Future BioEconomy

# Biorefineries updates

Meeting Wageningen , May 2019



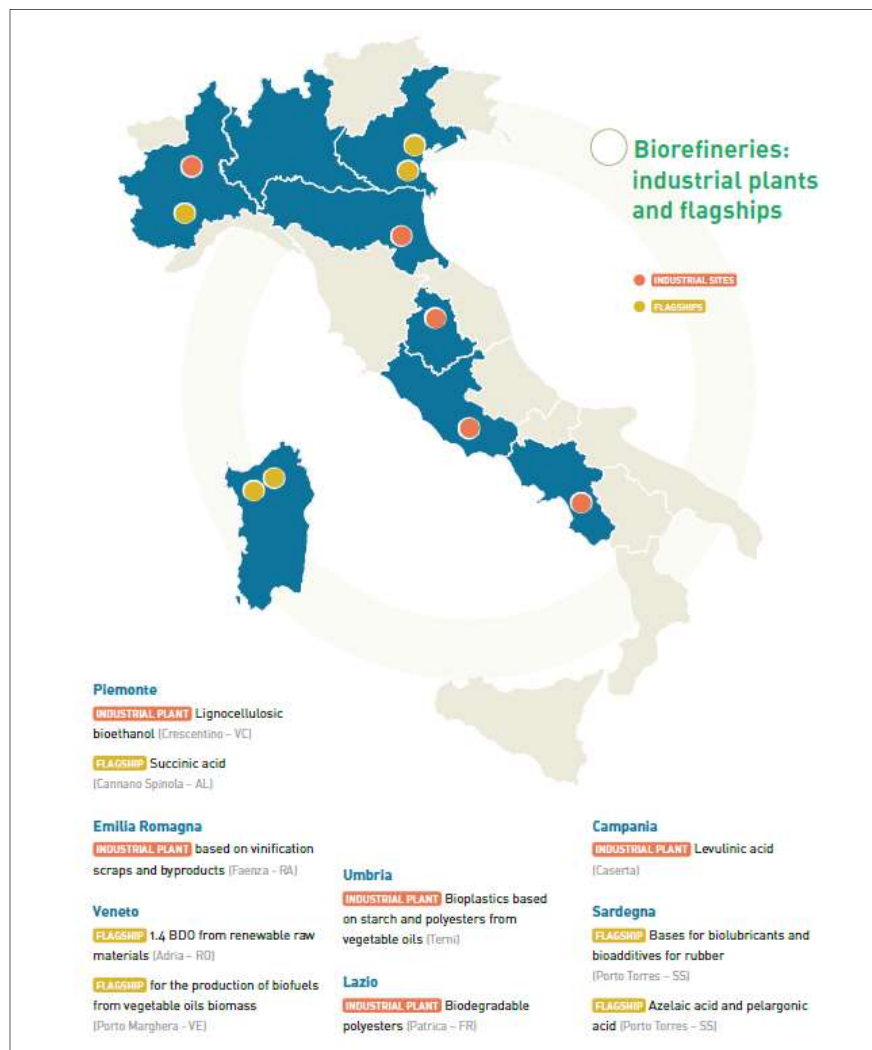
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**ENEA**

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# 1. Industrial biorefinery plants and flagship projects



## 5 flagships

Italy has important projects for the reconversion of industrial sites into biorefineries. Some of these projects have been recognized as flagship initiatives in Europe



### Mater-Biotech (Bottrighe, RO)

- Products
- 1.4 BDO
- Capacity
- 30.000 tons/year



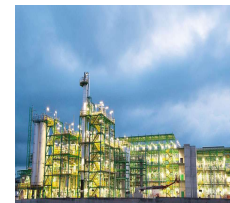
### Reverdia (Cassano Spinola, AL)

- Products
- Succinic acid
- Capacity
- 10.000 tons/year



### Mater-Biopolymer (Patrica, FR)

- Products
- Origo-Bi®
- Capacity
- 100.000 tons/year



### Matrica (Porto Torres, SS)

- Products
- Biolubricants
- Bioadditives
- Azelaic acid
- Pelargonic acid
- Capacity
- 350.000 tons/year



### ENI (Porto Marghera, VE)

- Products
- HVO (in the fractions of green-diesel, green-naphtha and green-gpl)
- Capacity
- 560 kton/year at 2021 (currently about 360 ktons/year) with a production of about 470 ktons/year of total HVO (currently about 300 ktons/year).

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## Novamont starts second unit for bio-polyesters (Patrìca)

Completed the reconversion of the plant in 2016 by the Mossi&Ghisolfi Group, Novamont inaugurated on the past October in Patrìca (FR) the Mater-Biopolymer plant for the production of **Origo-Bi®** the line of **biodegradable polyesters from vegetable oils and sugars – with a production capacity of 100,000 tons per year.**

The Patrìca plant will also produce a chemical product with high added value, **tetrahydrofuran (THF)**, strategic for the chemical and pharmaceutical industry achieved from renewable sources.



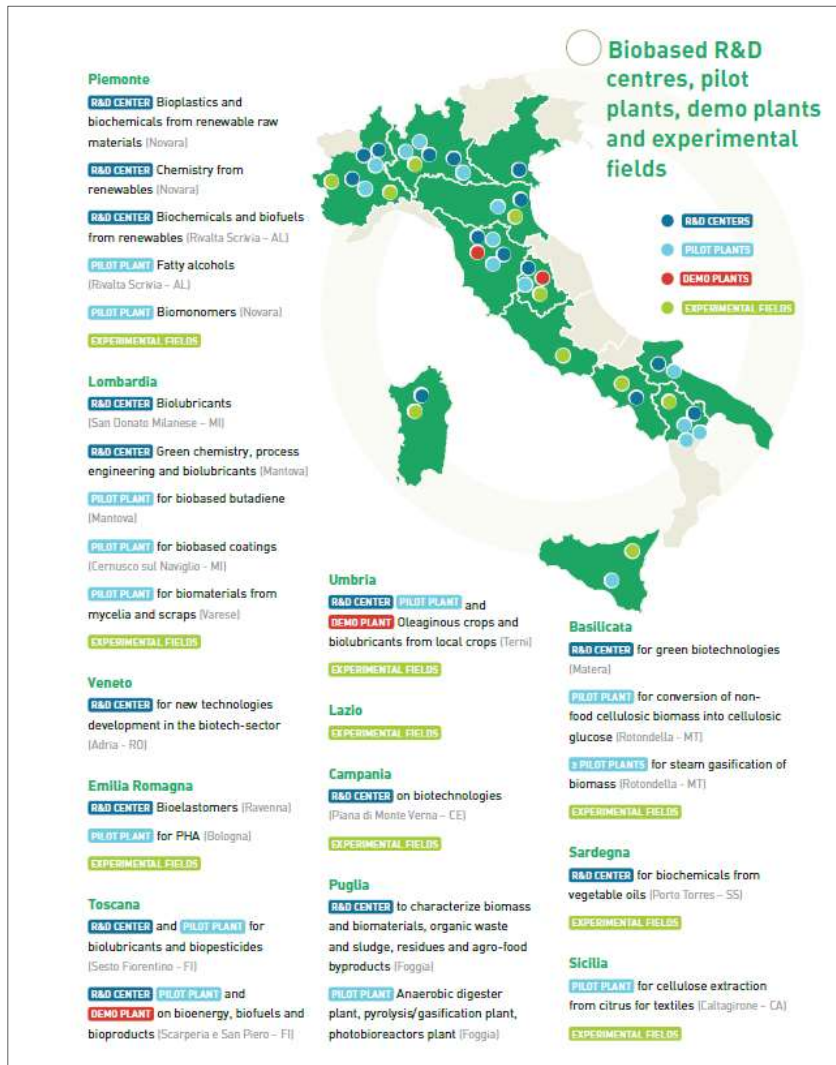
latest news

## Matrìca (JV Novamont-ENI) (Porto Torres, Sardinia)

An incurable break occurred in the relations between the top management of Novamont and ENI (the two big Italian Companies that signed the agreement to create Matrìca) and a consequent uncertainty about the feasibility of the Green Chemistry project in Porto Torres (Sardinia) which included - **in phase 3 - the construction of a Bioplastics plant** to be supplied with raw materials produced at the Sardinian industrial site.



## 2. R&D, pilot and demo biorefinery plants



### 2 demo+13 pilot plants, 14 R&D centres

Italy has important R&D centres scattered throughout the country and numerous installations on a demo and pilot scale.



#### Novamont (Terni, TN)

- Products**
  - Biolubricants and bioplastics from local crops
- Capacity**
  - 120.000 tons/year - compounding
  - 60.000 ton - polyesters



#### Mossi&Ghisolfi (Crescentino, VC)

- Products**
  - Bioethanol



- Capacity**
  - 40.000 tons/year

In October 2017, the Company has applied for unemployment benefits for all its 227 employees.



#### ENI (Gela, CL)

- Products**
  - Biofuels from vegetable oils
- Capacity**
  - 720.000 tons/year max capacity
  - 600.000 tons/year HVO production

The construction authorization arrived in 2017. The start of production is scheduled for 2019.

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## BioChemtex (ENI-Versalis)

The offer made by ENI-Versalis for the **"BIO" activities of the Mossi&Ghisolfi Group** were awarded at the conclusion of the competitive procedure ordered by the Court of Alessandria.

The operation includes assets and resources relating to development, industrialization, licensing of bio-chemical technologies and processes based on the use of renewable sources, in particular biomass, of the four companies Biochemtex, Beta Renewables, Ipb (Italian Bio Products) and Ipb energy.

The innovative element of these processes is the Proesa® technology for the **conversion of biomass in second-generation sugars and subsequent production of biofuels or, potentially, other bio-chemical intermediates**. The Crescentino industrial plant (VC) produces bio-ethanol and green electricity from lignin.

### 3. Italian start-up projects

Italy accounts for new start-ups in the bioeconomy sector - A narrow list of these realities is shown in the following table.

Name	Main activity
<b>MOGU</b>	develops innovative green building products made from a new material coming from agro-waste and fungi
<b>ORANGE FIBER</b>	creates sustainable fabrics for the fashion industry obtained from waste materials deriving from the production of citrus juices
<b>BIOERG</b>	focuses on the microbial production method to obtain dextran powder
<b>ALGA-CIRCLE</b>	supports the development of the Trebouxia microalgae on a special wool fabric and extracts its high-value components
<b>NAM</b>	develops silicon based airtel highly resistant to extreme temperatures obtained from rice husks
<b>BIOFP</b>	develops an innovative bioprocess for the conversion of value-free substrates into biofuels and biopolymers
<b>BABP</b>	aims to exploit biogas to produce biodegradable fuels and plastics
<b>EGGPLANT</b>	transforms waste-water into high-performance bioplastic solutions



**MOGU (Inarzo VA)**

- **Products**
- Innovative products and solutions for the fields of bio-architecture and design

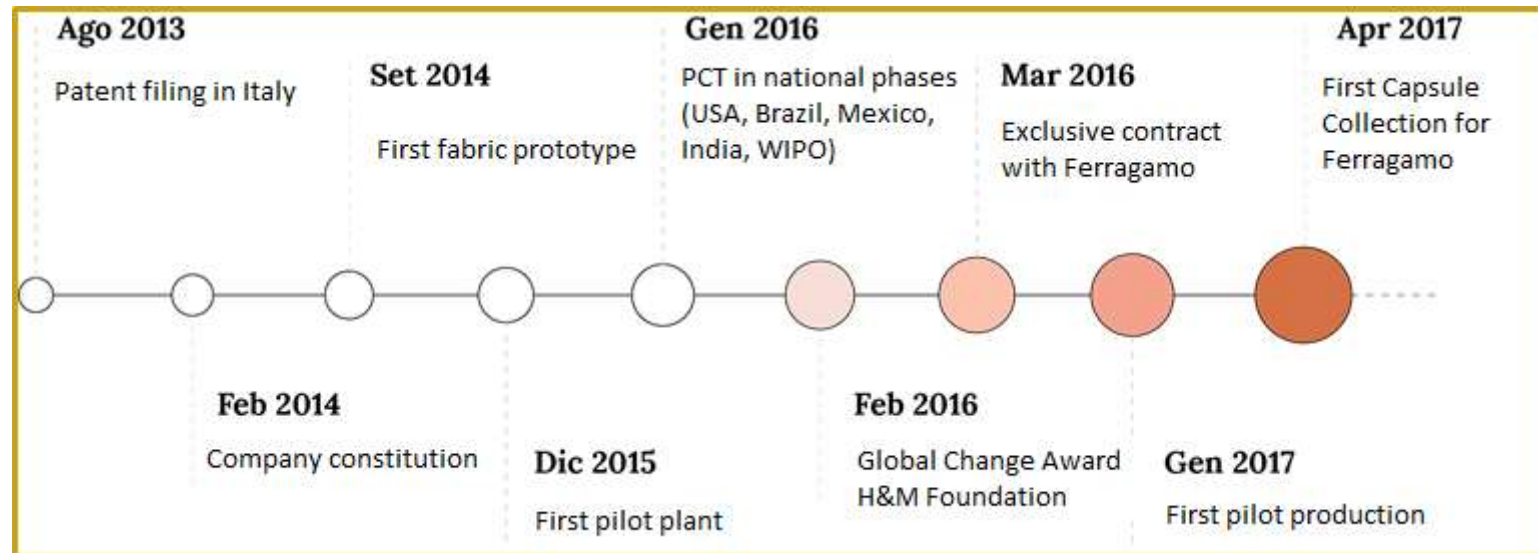


**Orange fiber (Caltagirone, CT)**

- **Products**
- Cellulose extraction for textiles
- **Capacity (goals)**
- Min 30 tons of cellulose/year (Capital investment 250 k€)
- Max 65 tons of cellulose/year (Capital investment 650 k€)
- **Potential of wastes**
- 700.000 tons/year ()

latest news

## Orange Fiber launches an equity crowdfunding



### Equity Crowdfunding (November, 2018):

**Minimum objective 250.000 euros** - Create a production plant capable of extracting up to **30 tons of cellulose per year**.

**Maximum objective 650.000 euros** - To increase investments for the construction of a production plant capable of extracting up to **60 tons of cellulose per year**.

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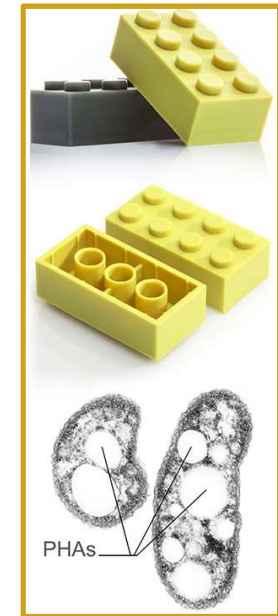
[www.task42.ieabioenergy.com](http://www.task42.ieabioenergy.com)

ENEA  
Italian National Agency for New Technologies,  
Energy and Sustainable Economic Development

## 4. Cutting-edge companies in Italy

### Bioplastics for toys

Bio-on and ITALERI confirmed their alliance for the toys of the future with new Minerv Supertoys, a eco-sustainable, child- and environmentally friendly, natural and 100% biodegradable biopolymer based line of toys. The product now goes to the market and the toys supply chain following completion of the test phase.



### Bioplastics for beauty

Bio-on launched a brand-new line of cosmetic ingredients for sun protection made from **biodegradable bioplastic**. The Minerv Bio cosmetics brand gains a new line of eco-friendly SPF (Sun Protection Factor) Booster products called minervPHB RIVIERA which are made with **micro powders made with Bio-on's bioplastic**, obtained from renewable plant sources and 100% biodegradable.



## 5. Major Italian R&D projects on biomass, bioenergies and biorefineries (1/2)

Italy boasts a number of research projects on biorefineries of national and international importance.

Acronym	Project name	Funding source	Coordinator	Duration	Weblink
<b>ISAAC</b>	Increasing Social Awareness and ACceptance of biogas and biomethane	H2020	AzzeroCO <sub>2</sub> (ITALY)	2016-2018	<a href="http://www.isaac-project.it">www.isaac-project.it</a>
<b>EMBRACED</b>	Establishing a multi-purpose biorefinery for the recycling of the organic content of Absorbent Hygiene Products Waste in circular economy	H2020	Fater S.p.A. (ITALY)	2017-2022	<a href="http://www.embraced.eu">www.embraced.eu</a>
<b>FIRST2RUN</b>	Flagship demonstration of an integrated biorefinery for dry crops sustainable exploitation towards biobased materials production	H2020	Novamont S.p.A. (ITALY)	2015-2019	<a href="http://www.first2run.eu">www.first2run.eu</a>
<b>BIOSKOH</b>	BIOSKOH's Innovation Stepping Stones for a novel European Second Generation BioEconomy	H2020	BioChemtex S.p.A. (ITALY)	2016-2012	<a href="http://www.bioskoh.eu">www.bioskoh.eu</a>
<b>GRACE</b>	GRowing Advanced industrial Crops on marginal lands for bioEfineries	H2020	(GERMANY) Italian partecipation	2017-2022	<a href="http://www.bbi-europe.eu/projects/grace">www.bbi-europe.eu/projects/grace</a>
<b>ZELCOR</b>	Zero Waste Ligno-Cellulosic Biorefineries by Integrated Lignin Valorisation	H2020	(FRANCE) Italian partecipation	2016-2020	<a href="http://www.zelcor.eu">www.zelcor.eu</a>
<b>PEFrence</b>	From bio-based feedstocks via di-acids to multiple advanced bio-based materials with a preference for polyethylene furanoate	H2020	(NETEHRLAND) Italian partecipation	2017-2022	<a href="http://www.bbi-europe.eu/projects/peference">www.bbi-europe.eu/projects/peference</a>
<b>BRISK II</b>	Biofuels Research Infrastructure for Sharing Knowledge II	H2020	(SWEDEN) Italian partecipation	2017-2022	<a href="http://www.brisk2.eu">www.brisk2.eu</a>

## 6. Major Italian R&D projects on biomass, bioenergies and biorefineries (2/2)

Italy boasts a number of research projects on biorefineries of national and international importance.

Acronym	Project name	Funding source	Coordinator	Duration	Weblink
<b>LIDIA</b>	Second Generation Technologies for The Production of Dicarboxylic Green Acids as Renewable Building Blocks for Chemical and Polymers Synthesis	Ministry of Education, University and Research	Politecnico di Milano	2014-2017	<a href="http://www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/lidia/">www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/lidia/</a>
<b>ALBE</b>	Alternative Lignocellulosic Biomasses for Elastomer	Ministry of Education, University and Research	ENI-Versalis	2014-2017	<a href="http://www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/albe/">www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/albe/</a>
<b>BIT3G</b>	Third generation biorefineries	Ministry of Education, University and Research	Novamont S.p.A.	2014-2017	<a href="http://www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/bit3g/">www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/bit3g/</a>
<b>REBIOCHEM</b>	Biochemical from biomass	Ministry of Education, University and Research	Novamont S.p.A.	2014-2017	<a href="http://www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/rebiochem/">www.researchitaly.it/cluster-tecnologici-nazionali/chimica-verde/rebiochem/</a>

latest news

## The new (2019) Italian strategy



**14 May 2019**



The new Italian bioeconomy strategy was presented in Rome.

The document underlines the importance of **defining sustainability standards to support the bio-based market and creating a 'level playing field' between bio-based products and conventional products.**

In this regard, the strategy explicitly refers to **the Horizon 2020 STAR-ProBio project**, coordinated by the University of Rome Unitelma Sapienza.



**23 May 2019**



The Bioeconomy day. Many parallel events organized in Italy on Bioeconomy.

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