Let's not waste what we've built so far!

The Italian case study of circular bioeconomy at the EU Bioeconomy Conference 2022

By Catia Bastioli, Novamont CEO.

The **EU high-level Bioeconomy Conference 2022** 'Enabling the European Green Deal in Challenging Times' took place on 6th and 7th October at the Charlemagne building in Brussels.

The **EU Commission** remarked on the findings of the **EU Bioeconomy Strategy Progress Report**, presented in June 2022, highlighting the strategic importance of the industry as a central element of the **Green Deal** for a fair and just ecological transition. The event was also a great opportunity to discuss with key European stakeholders on how to push Bioeconomy towards a full industrial implementation.

It was a great honour for me to be asked to present the **Italian case study of circular bioeconomy**, which started 30 years ago thanks to the pioneering activities of **Novamont**.

The Italian case study of circular bioeconomy

Novamont started its adventure in the 1990s as a **research centre** with the pioneering idea of building an integrated value chain, rooted in local areas, for **bioplastics and biochemicals**. Thirty years on, it has become an International group, and a **B-Corp** certified **Benefit Company** since 2020.

With **650 people**, **20%** of whom are employed in research and development, Novamont Group posted sales of **€ 414 million** in 2021 and was named a **'Best for the World'** in Environment B-Corp for the second year running in 2022.

To date, Novamont has used **five** of its **world-first proprietary technologies** to convert five de-industrialized sites into bioeconomy facilities. With investments of more than **€ 800 million** to date, new **biotechnological** and **biochemical processes,** and **bioproducts** have now reached industrial scale at the EU level. Some examples are the plants producing **bio butanediol** - **1,4 BDO** from sugar fermentation, **azelaic** and **pelargonic acid**, **bio tetrahydrofuran -THF**, **Origo-Bi biopolyesters** and **Mater-Bi compostable and biodegradable bioplastics**. All of our plants are equipped to use renewable raw materials from different sources, including organic by-products and scraps.

To ensure an increasingly sustainable use of biomass, we have set up a long-lasting cooperation with **Coldiretti**, the largest farmers' association in Europe, based on the cascading use of drycrops, such as cardoon or sunflower, capable of both providing raw materials and bioenergy, as well as regenerating **marginal soils**[1].

Bio-based products 'to do more with less'

From the outset, our bioproducts, including bioplastics, biolubricants, bio-herbicides, ingredients for cosmetics were conceived to overcome the issue of accumulating pollutants in water and – mainly - in soil, a non-renewable resource. Thanks to their eco-design, they proved to have multiple positive impacts.

[1] D'Avino, L.; Di Bene, C.; Farina, R.; Razza, F. Introduction of Cardoon (Cynara cardunculus L.) in a Rainfed Rotation to Improve Soil Organic Carbon Stock in Marginal Lands. Agronomy 2020, 10, 946. https://doi.org/10.3390/agronomy10070946

A relevant case study at Nationwide scale is provided by the **carrier bag**: from being a negative flag of the use of plastic, it has become a key tool for promoting the recycling of organic waste into high-quality compost, restoring soil fertility and supporting **decarbonization**.

A simple compostable bag with a range of legislative measures indeed has led Italy to be the highest ranking in Europe for food waste collection (47% of the total, against the European average of 16%)[2]; it has also led the collected organic waste fraction to grow from **2.5 million tons** in 2007 to **7 million tons** in 2020[3] with a greater amount of clean organic compost returned to our soil; the use of single-use carrier bags has also **decreased in volume** by more than **58%** from 2009 to 2021[4]. A remarkable example of **'doing more with less'**!

A national platform with multiple players

Today, the bioplastic and biochemical value chain in Italy is served by **275 operators**, has a turnover of more than € 1 billion and a 10% annual growth rate of.[5] This value chain ensures that Italy can now boast a circular bioeconomy platform with multiple players (farmers, composters, retailers, municipalities); a virtuous policy for organic waste management, and an infrastructure that can maximize quality compost and enhance the value of organic carbon.; It has also led to the creation of **Biorepack,** the first mandatory bioplastic consortium for monitoring the end of life of bioplastics and fostering new forms of recycling to be implemented worldwide; and to that of **SPRING,** the National Circular Bioeconomy Cluster which brings together more than 130 businesses, universities and associations.

The challenge: let's not waste what we've built so far!

The recently published EU Bioeconomy Strategy Progress Report[6] had shown what bioeconomy is capable of, given the chance. As remarked by **Commissioner McGuinness,** bioeconomy is one of the most powerful tools we have to ensure Europe's sustainable future.

The first challenge is to avoid using bio-based products just in a drop-in logic. Vegetable resources are precious and need to be used as catalysts to **'do more with less'**. Otherwise, it may have dangerous effects which would add to climate change, ecosystem degradation, growing pollution, raw materials and energy crisis, rather than mitigate them.

The second challenge is to ensure that European **bioproducts** and **bioindustries** have proper recognition, as they do in several other countries. Indeed, a series of inconsistencies in the European legislative framework risk crowding out the industry and wasting the substantial public and private investment that's been made in Europe over many years.

For instance, in the present critical environment for raw materials and energy in Europe, **European renewable biobased and biodegradable products with a lower global warming potential than fossil-based products** [estimated in 0.4-0.8 €/kg assuming the current EU price of CO_2 at about 80 €/ton], are penalised in comparison to Asian fossil products which are not subject to the **EU Emissions Trading System - ETS**. On top of that, innovative full-scale industrial plants for bio-based and biodegradable products have to pay for CO_2 in addition to the fact that their decarbonization potential is not recognized.

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[2] BIC-ZWE report - Bio-waste generation in the EU - current capture and future potential, 2020.
[3] Ispra, Rapporto rifiuti urbani Edizione 2021
[4] Assobioplastiche, Plastic Consult, La filiera dei polimeri compostabili, Dati 2021 e prospettive, 2022.
[5] Ibidem.
[6] European Commission, EU Bioeconomy Strategy Progress Report, 2022.

To solve this unsustainable situation, we need to align the **ETS** with the **Green Taxonomy** to support the biobased industries that contribute to decarbonisation. We need measures ensure that the value of bioproducts of renewable origin is recognized, as well as their dynamic evolution towards decarbonization. Good examples are the Italian and French laws on fruit and vegetable bags, which require respectively 50% and 60% renewable content, and the German law on biodegradable waste bags which requires a renewable content of at least 50%.

We also need specific **NACE /EER** codes to fully exploit by-products in a truly circular logic. In this regard we cannot forget that bioeconomy is a dynamically evolving sector and current legislation should consider the need for experimental activities.

Lastly, the third challenge, is to have a **New Lead Market Initiative** with **go-to-market measures** for those new bioproducts which can significantly contribute to the transition towards a Circular Bioeconomy.

The great challenge we face is not to waste what we have built so far and our leadership. My hope is that this conference will therefore increasingly put bioeconomy at the heart of the European strategy, as is happening in the United States, where new investments and resources have just been announced to promote **President Biden's National Biotechnology and Biomanufacturing Initiative**[7], or in China with its new five-year Bioeconomy Plan.

In practice, we should start moving bioeconomy from a regulatory framework purely related to research and development towards a framework that can push this industry as a strategic element of the European industrial policy.

[7] Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy, September 12, 2022