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"The circular bioeconomy as a main pillar of the ecological transition": Presentation of the Bioeconomy in Europe 2023 Report

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The environmental, economic and social crises and the new geopolitical balances or imbalances are interconnected criticalities of enormous proportions. When it comes to exponential phenomena, we cannot think to afford them with targeted or siloed actions.

We cannot hide that after decades of continuous debate on environmental issues, and eight years after the COP Conference in Paris, there is no change of course. As reported during the COP28, 2023 is on track to be the warmest yea ever, with the highest concentration of CO2 emissions in the atmosphere. Furthermore in 2021 the mass of products produced by mankind overcame the biomass of nature, another exponential phenomenon which explain the increasing need of raw materials, the pollution problems and increasing geopolitical tensions. In this context renewable resources are not enough if we don't change our mindset.

Having ambitious targets is important but it is absolutely crucial to understand how to accelerate the transition now, involving an important part of society. Otherwise, we will continue to talk about targets and to record our failures to reach them.

The key factor is a change of mentality. We all must to decouple development from natural resource use, learning to do more with less. In this direction, the circular bioeconomy is a great opportunity for innovation and regeneration because it is rooted in the soil and in the territories, it is interdisciplinary and connects different sectors and technologies, and above all it starts from local specificities and integrated value chains.

The bioeconomy should be a pillar of the Green Deal thanks to its ability to rethink the production, use and end-of-life of bio-products, starting from soil regeneration, agricultural practices, the application of new technologies to waste and by-products, without wasting anything and promoting participatory innovation.

And this is what I have tried to do in my journey in the field of the circular bioeconomy, which began many years ago with Novamont: to build, from a research centre, not just a simple company, but an industrial demonstrator with a circular logic, rooted in the territories, trying to use renewable raw materials and new technologies for innovative biomanufacturing plants, and to use bioproducts not as business as usual, but as a catalyst for cultural change.

Thanks to our pioneering activities, and to the fundamental support of the BBI JU, now CBE JU, industrial-scale bioeconomy plants have already been built in Italy (over €1 billion invested in the regeneration of disused sites). These fully operational plants produce a range of decarbonised bioproducts, such as bioplastics, biolubricants and bioherbicides, which have already been shown to prevent water and soil pollution, regenerate ecosystems, and redesign entire application sectors, driving the made-in-Italy and made-in-Europe towards a greater sustainability.

A case study with relevant impacts on a national level is provided by the carrier bag: from a negative flag for plastic packaging, to a tool to promote the recycling of organic waste into high-quality compost for soil fertility and decarbonization (from 2.5 million tons in 2007 to 7,6 million tons in 2021). The use of single-use shopping bags also decreased in volume by more than 58% from 2009 to 2021. A remarkable example of 'doing more with less'!

Today, this industry has a total turnover of 1,168 million euros and is represented by 271 companies and 3,005 dedicated employees. Moreover, Italy can now boast of a circular bioeconomy platform involving the sectors of agriculture, waste treatment, large-scale distribution, as well as institutions, municipalities, and the environmental world. Made in Italy value chains can count on a series of synergetic bioproducts that can drive them towards decarbonization and greater sustainability.

Europe has strongly promoted bioeconomy research and development over the last 15 years, even with a European bioeconomy strategy. The BBI JU, which has become CBE JU, has been crucial in establishing Europe's bio-based industry sector as a global leader, with €904 million invested, the first 13 flagship biorefinery, 161 projects, 157 new materials, 11 new bio-based value chain with performance equal or superior to their fossil-based counterparts. Every euro has attracted almost three times as much in private investment.

However, there are important factors that prevent the European bio-based industry and related value chains from taking advantage of the innovations and important investments that have already been made.

The most important of these is the uncertainty caused by the constant and complex evolution of the regulatory framework on the biomanufacturing plants and bioproducts. The effect is that for each new directive they are called into question and sometime attacked, ending up adding uncertainty and reducing their positive impact on the transition.

In short, there is a lack of recognition of the biorefineries of circular bioeconomy and of the biobased products, even within the policies and guidelines of the Green Deal, with probably unwanted but serious consequences that we cannot afford.

These sectors are penalized three times:

1) by the fact that being emerging sectors they have a small size so it is difficult to activate anti-dumping measures toward attacks from outside Europe, which are getting heavier after the covid and the war in Ukraine;
2) by the fact that the emission reduction contribution compared to imported fossil products is not recognized. Add to this, the fact that innovative plants, built with huge investments, are also subject to ETS mechanism without any compensation, whereas the Carbon Border Adjustment Mechanism will only apply by 2026.
3) Finally, restrictions on the use of bioproducts are continually set up. Think of compostable or soil biodegradable bioplastics: which instead are opportunities to rethink entire supply chains by having all possible recycling routes (organic, mechanical, chemical) and to maximize the recovery of organic waste avoiding the generation of microplastics, as well as to decarbonize. Then think of the recent history of some biochemicals, natural active ingredients that can be used as bio-phytosanitary products, whose re-registration is in its fifth year of postponement while glyphosate has been confirmed for another ten years. Think of the organic waste sector and the importance of its recycling, whereas the recycling level of food waste of Europe today is of 16%, and to the reopening of the waste framework directive even before EU countries have mostly implemented it.

The question is: given what is happening to those who have invested in Europe, why would anyone invest in new biorefineries and bioproducts?
It is clear that we need to reverse course and, at least, to give flagships plants and related bioproducts proper recognition and space for experimentation that they do not have today while avoiding confusing the solution with the problem.
We must also overcome silo logic and humbly learn to understand that there is no single way to resolve the enormous exponential phenomenon that we have generated. There are those who wave the flag of reuse against recycling or those who think that everything can be recycled eternally and, above all, those who want to impose their linear vision of problem solving.
Instead, we must recognize that we need a multiplicity of solutions to manage the climate crisis together with resource scarcity, pollution and ecosystem regeneration, while preventing the social fabric from continuous degradation. This is why the local dimension is fundamental.
What is needed:
For sure we need to give more access and dissemination to the positive experiments done over many years on the local areas by making them useful demonstrators to be monitored, to be used as field training not only for researchers, industrialists, farmers, large retailers, environmental and labor worlds, but also for the institutions, communities and territories hosting the case studies.
The knowledge economy will help to have proactive approaches in the regulatory process as well, and will prevent inappropriate prohibitions. Just as an example of what inappropriate prohibitions produce, if we look at the results of the SUP directive, our markets are overwhelmed by so-called reusable products, with effects opposite to those for which the SUP was created.
Just think of the packaging regulation, that as it was presented, is a clear example of a top down approach, with a very negative impact not only on the packaging sector, but also on the agri-food industry and on those supply chains, such as that of bioplastics, one of the multiproduct of the biorefineries of the bioeconomy, with multiple benefits linked to the specificities of territories, contributing to the wealth of local areas and driving entire supply chains towards sustainability. But on this specific case the EU Parliament did a great teamwork, avoiding severe negative impact that could have wiped out a 20 years national model like the case of Italy with its innovative chains in recycling, in bioplastics and in organic waste recovery and recycling. We must learn from this experience for the future.
We need specific statistical codes (i.e NACE / EER codes) for the bioeconomy sector for a full implementation of the circular bioeconomy, not only by distinguishing sustainable processes and the valorisation approach of secondary raw materials, but also by making possible the use of precious sludges similar to that of the agri-food sector.
We need that the framework of the sustainable investment taxonomy besides the sectoral economic approach could be able to capture the evolutionary potential and systemic value of the innovative biorefineries of circular bioeconomy and their bioproducts, their function as innovation hubs in the local areas interconnecting value chains, companies, communities, considering not only the origin of the raw material but also the environmental impacts and benefits of the products at the end of their life.
We need to have truly systemic standards and systemic and smart certifications (the hope lies in ISO 14067), in the CSRD that will arrive soon, and in monitoring systems as well as in combating fake products which is another concrete problem for Circular Bioeconomy. Otherwise, the most virtuous initiatives will fail.

We need to change the system and we also need to learn as a Continent and as a Country, to make the most of the value of our own integrated value chain.
Like many other phenomena, technological growth is experiencing exponential development in a very short time, together with a series of enormous ethical and regulatory issues. It is essential that regulations leave room for this impressive dynamic evolution, learning on the field through territorial projects / flagships.
It is fundamental to know that we don't know, and that top-down, short-sighted or overly demanding thresholds as well as continuously moving targets end up paralysing the transformation.
It is fundamental not to throw away what has been built, and instead to use incremental innovation to promote the diversity of solutions associated with territories. Wisdom must prevail, not slogans and actions against, but bridges between economy and ecology for evolutionary approaches. Technologies are not good or bad, it depends on the wisdom how we use them. Otherwise, renewable resources will not be enough to make the transition.
Thank you so much for your attention.