15 February 2024

Key Actions for Bioeconomy in the EU – Summary of non-paper (Estonia, Finland, Italy, Latvia, Spain, Sweden)

Bio-based solutions and biotechnologies enable circular bioeconomy and together they can play a key role in meeting many global sustainability challenges. They have the ability to increase the EU's competitiveness and to generate new business and jobs, thus contributing to the EU's resilience, open strategic autonomy and rules-based trade. The EU must maintain its leading role in bioeconomy and transcend global competitiveness by investing heavily in strategically important areas such as biotechnology and biosecurity. It is crucial for the EU to rapidly unleash the full potential of its sustainable bioeconomy.

Bioeconomy and biotechnology can play a remarkable role in the areas of

- **Critical dependencies.** Sustainably produced bio-based raw materials in the EU offer renewable, reusable and recyclable alternatives for fossil solutions, adjustable also to regional and rural conditions. They can decrease critical dependencies and contribute to the EU's increased resilience and open strategic autonomy and rules-based trade.
- **Climate and sustainability.** Sustainable bioeconomy provides solutions to climate and environmental challenges. It plays an important role in implementing and supporting the green transition of our society in replacing fossil and non-renewable resources in product manufacturing.
- **Innovation.** Bioeconomy provides several new opportunities for technologies and solutions. Biotechnology provides new production methods, products and applications, and enhances circularity, and thus efficiency, through the use of bio-based side-streams, waste and water.

Examples of biotechnology and bio-based solutions

- Use of renewable biomass sources for high-value innovative products such as batteries; in chemical production; as replacements for fossil-based or non-renewable materials such as for packaging, for textiles as well as for substitutes for fossil fuels.
- Wood and other bio-based materials in construction providing options for carbon storage and decrease the carbon footprint in the construction sector.
- New biotechnology applications such as proteins for food and feed, medicines, chemicals and biosynthetic materials.
- Alternatives for textiles made of oil-based and environmentally challenging fibers.
- Bioeconomy supports the hydrogen economy through capture, storage and use of biogenic CO2.

Action points for the next EU Commission

- Bioeconomy should be recognized horizontally as an elementary part of the EU's industrial policy and its instruments. Therefore, predictable and coherent EU regulation and communications should support and enable the development and investments in bioeconomy.
- Funding for R&D, including innovations and bio-based industrial applications, is a prerequisite for an unbroken value chain. In particular, targeted biotechnology R&D efforts should be increased to enable the full benefits of strategic and critical technologies.
- An industrial alliance, an accelerator or thematic clusters for bioeconomy and biotechnology should be established to enable the European industry to unlock the full potential of bioeconomy.
- Generate supportive actions for collaboration between private and academic sectors in order to promote innovation, investments and new business opportunities.
- The EU's bioeconomy strategy should be renewed by 2025 in order to maintain competitiveness, to increase value added of biomass-based production chains, to advance critical biotechnologies, and to secure the EU's resilience, open strategic autonomy, rules-based trade and to ensure long-term commitment to bioeconomy policy development and implementation through enhanced EU policy coordination and sectoral coherence.

NON-PAPER OF ESTONIA, FINLAND, ITALY, LATVIA, SPAIN AND SWEDEN ON BIOECONOMY

1. Bioeconomy

Bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles. It includes and interlinks land and marine ecosystems and the services they provide, all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture), and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services.

The concept of bioeconomy covers also the new applications developed within different fields of biotechnology, which harness cellular and molecular processes to develop technologies and products. The rapid development of biotechnology will bring new opportunities for science-based applications through gene technology and synthetic biology.

Biotechnology and life sciences contribute to the modernization of European industry. They are used in a variety of industrial sectors such as healthcare and pharmaceuticals, animal health, textiles, chemicals, plastic, paper, fuel, food, and feed processing. Taking advantage of biotechnology helps the EU economy grow and provides new jobs, while also supporting sustainable development, public health, and environmental protection.

We are on the verge of a biotechnological revolution, which is broadly enabling and disruptive. In the near future, we expect to see exciting and even yet unforeseen applications, services and products coming from the field of biotechnology. In addition to altering consumers' everyday lives, biotechnology is transforming industrial processes in chemical, energy, food, pharmaceutical, and pulp and paper industries, just to name a few.

The economic output of bioeconomy has primarily increased in parallel with production volumes. However, in the future, more emphasis should be placed on innovations, investments and production that contribute to increasing the value added and building circular bioeconomy value chains, while further examining potential risks and effects on biodiversity. By consolidating its leadership in this field, the EU must also promote a bioeconomy model that respects biodiversity and is in line with the commitments of the Kunming-Montreal Global Biodiversity Framework. Investing in new, resource- and energy efficient processes will offer significant potential for increasing both total production and the use value of existing resources in bioeconomy whilst aiding decarbonisation.

2. Biotechnology and bio-based solutions play a key role in solving global challenges

Bioeconomy plays an important role in supporting the society's green transition. Sustainable bioeconomy is a solution to several environmental, climate, food system and energy security challenges. Green transition is increasingly also a matter of economic security, regional development, resilience, open strategic autonomy, rules-based trade and job creation mainly in rural areas, many of them with depopulation.

There is a long list of application areas where bio-based materials, nature-based solutions and biotechnologies can provide more sustainable alternatives to existing fossil-based solutions. The potential of sustainable bioeconomy is still untapped, for example in the fields of packaging materials, cellular agriculture, low-carbon construction materials, bio-based molecules, specialty and commodity chemicals, wood-derived battery materials, textile fibers and nano-cellular applications in biomedical research. Bioeconomy and hydrogen economy support each other by

sequestration, capture, storage and use of biogenic CO2. They will play an increasingly important role in achieving the EU's ambitious climate objectives. It is important to maximize the conversion efficiency of carbon into products. Some biodegradable and compostable solutions may allow, in suitable conditions, to optimize biowaste management and to avoid microplastics pollution in applications that are in contact with food and organic content or that are more prone to be release residues in the environment (i.e. mulching films).

A large number of sustainably manufactured products are needed for the implementation of green transition, and ensuring the supply of raw materials of sustainable origin. The bioeconomy is an elementary industrial dimension of green transition and the EU's sustainable growth and competitiveness. We need new product innovations and circular solutions to promote circular bioeconomy and sustainable carbon cycles. This again must be done simultaneously with target-oriented climate policy by phasing out fossil emissions and replacing fossil raw materials with nature based and sustainable bio-based value chains. It is crucial that the conversion of bioresources into sustainable products is resource-efficient in regard to water, energy and material use. To ensure the long-term legitimacy for bioeconomy, sustainability work in the sector must be highlighted. Additionally, enhanced application of biotechnology innovation can support enhanced energy and resource efficiency aiding industrial decarbonisation

In order to create high value-added bio-based products and uptake of biotechnology, we need more innovations, which in turn require more research and more up-scaling, e.g. research infrastructure, pilots, demonstrations and commercialization. All these steps require further coordination and resources to combine best available skills and platforms. Enough highly educated and other workforce are a necessity. Typically it takes 5–10 years and an investment in the range of 10–50 million euros to develop new value-added bio-based product for market entry.

The bioeconomy provides opportunities for diversifying business activities in rural areas, creating and preserving jobs, increasing vitality and developing value chains based on local resources. Sustainable development of bioeconomy can improve the profitability of primary production and the livelihoods of rural areas as well as ecological, economic, social and cultural sustainability.

A sustainable bioeconomy requires a sustainable supply chain, including sustainable biomass feedstock production, cooperation and logistics, sustainable biomass conversion processes and sustainable products and market development. Strengthening the 'doing more from less' principle of circular economy and ensuring the sustainability of the raw material base will help achieve climate, food system and biodiversity targets, strengthen ecosystem services and boost well-being without increasing the consumption of natural resources.

3. Measures needed at EU level

Bioeconomy and biotechnology are areas where Europe can achieve global technological leadership by turning science into innovations and useful applications.

To achieve this, bioeconomy and biotechnology should be an elementary part of the EU's industrial policy and its instruments. It is possible to remarkably increase the gross domestic product impact of bioeconomy in Europe. Maximizing the GDP impact requires swift transition from producing bio-based raw materials for other continents to producing high value-added products in Europe. However, the industry alone is not able to carry the risk required to develop all necessary solutions. It is essential to enable necessary public and private funding for RDI and breakthrough innovations and technologies, while also ensuring that potential competition distortions remain limited. It is not enough to invent new solutions in Europe, but also to manufacture products here. The pathway from inventions to manufacturing should be quicker.

The importance of biotechnology in particular is growing. The world's leading economies have recently invested a great deal in technologies within bioeconomy. The emphasis and actions should be put to promote capabilities both for RDI and industrial-scale biomanufacturing and biorefining. The EU should include biotechnology's means in its bioeconomy development programmes and strengthen international cooperation in this area.

The EU bioeconomy strategy with RDI focus should also be challenged to be taken to the next level to provide solutions for industrial renewal. Biotechnology and biomanufacturing are becoming important accelerators for bioeconomy. Therefore, the Commission is encouraged to renew the EU Bioeconomy Strategy and Action Plan by 2025, taking into account the progress report on the EU Bioeconomy Strategy, the conclusions on bioeconomy from 2023 and changes in the global operating environment.

Recently, the regulatory environment has been evolving substantially and the cumulative effect of new regulations has still to be further analyzed during the implementation phase, to ensure coherence. Several new legislative proposals on green transition have been made, but their cumulative effect needs to be sufficiently evaluated. Industry perspectives of bioeconomy should be taken into account already in the planning phase of regulatory proposals, including chemicals legislation and other regulatory frameworks. To unleash the full potential of bioeconomy, regulation should better take into account the sustainable use of renewable raw materials and it should support use of safe biotechnology production methods.

4. Action points for the next EU Commission

It is important to promote research and innovation and improve alignment between scientific advances, industry policy and social cohesion, and to better integrate bioeconomy in all policies. There is a need to ensure coherent and effective policies that support the development of bioeconomy across the whole value chain and enable taking advantage of the solutions it provides, while ensuring the protection of the environment and society, and addressing regulatory barriers.

Europe's bioeconomy should be recognized as a strategic industrial ecosystem supporting the EU aim to be climate-neutral by 2050 – that is, an economy with net-zero greenhouse gas emissions including a circular economy and a sustainable food system. In this context, the Commission needs to analyse the status and possibilities of bio-based materials, biotechnology and biomanufacturing as strategic capabilities. The analysis needs to be included in the transition pathway co-creation process in all relevant industrial ecosystems as well as in the annual in-depth review of strategic areas of EU interests and strategy work.

The challenges facing the European bioeconomy include that the bioeconomy is not sufficiently recognized horizontally in EU policy and its policy instruments. Also enhanced targeted biotechnology and bioeconomy R&D efforts including scaling up are necessary to enable the full benefits of strategic and critical technologies. The added value of bioeconomy products should be recognized and their market uptake promoted. There is as well a need for further industrial engagement to accelerate bioeconomy and biotechnology to enable European industry to unlock the full potential of bioeconomy and a need for improved cross-checking of existing policy and regulation to ensure removing overlapping or conflicting requirements.

Achieving the above-mentioned objectives and solving the challenges require actions from several DGs and cooperation between different DGs.

The EU Commission should

1. ensure coherent policy development and a logical enabling regulatory framework to realise the opportunities brought by bioeconomy. This includes cross-checking existing regulation and analyzing the possible overlapping or conflicting requirements.
2. take up bioeconomy in the European industrial policy agenda, as well as into other sectorial policies, in order to secure unbroken value chain from research, piloting and demonstration to scale-ups and industrialization.
3. recognize the value added of bioeconomy products and promote their market uptake.
4. prioritize funding of bioeconomy and biotechnology in Horizon Europe programmes and the multi-annual financial framework to encourage innovation and first-of-a-kind investments.
5. renew the EU bioeconomy strategy by 2025 in order to

- enhance the EU's competitiveness compared to other global actors,
- secure the availability of sustainable produced biomass
- enhance cooperation with primary producers as part of the unbroken value chain
- develop know-how and skilled labour in Europe,
- develop and secure implementation of critical biotechnology and biorefining in the EU,
- take into account the potential effects on biodiversity,
- support and encourage all Member States to draw up or update their bioeconomy strategy,
- secure EU's resilience, open strategic autonomy, security of supply and increased self-sufficiency in a changing operating environment.

6. streamline the EU's permit procedures so that innovations can be efficiently and swiftly placed on the market.
7. establish an industrial alliance, an accelerator or thematic clusters for bioeconomy and biotechnology to enable the European industry to unlock the full potential of bioeconomy.
8. strengthen collaboration between private and academic sectors to promote innovations, investments and new business opportunities as well as skills development.
9. improve the capacity to distinguish companies operating in bioeconomy sector, e.g. by recognizing them through NACE codes.