

A Circular, Renewable and Smart Bioeconomy

Finland's priority proposals for European Union

New business from the bioeconomy

- New business should be generated by means of rethinking value chains, risk financing, bold experiments, strong regional markets and the crossing of sectoral boundaries.
- The bioeconomy strategy is supporting fundamental research, but more focus should also be given to applied research and near-to-market activities.
- Immaterial value creation should be promoted to increase the added value of products and services.
- EU -policies and research activities should support the development of new technologies and innovations as part of a sustainable bioeconomy and guarantee a predictable operating environment for new investments.

Accessibility and sustainability of biomasses

- The availability of renewable natural resources should be secured with well-functioning raw material markets and sustainable resource use.
- Biomass availability for current and future uses should be further enlarged through side streams and residues.
- Public awareness and acceptability of the bioeconomy should be increased.
- Better information should be provided on biomass resources and their usability and sustainability; digitalised biomass management is a means to secure sustainability.
- Protecting biodiversity and ecosystem services must be an integral part of sustainable bioeconomy.

Coherent policy environment and actions

- Greater coherence should be sought between various EU policies.
- The scope of the bioeconomy should be both widened and deepened.
- The policy framework should be flexible, giving Member States the possibility to choose the actions most suitable for national conditions.
- Greater international collaboration should be pursued in regard to harmonisation of certification, opportunities for bio-based procurement and exchange of information on best practices with countries outside EU.

Competitive operating environment for the bioeconomy

- The encouraging and predictable legal and policy framework is needed.
- Greater attention should be given to replacement of fossil raw materials with sustainable renewable and secondary raw materials with added value in order to tackle climate change and promote sustainable development.
- Greater recognition should be given to the important role of public procurement in promoting and opening markets for bio-based products and services including new business models.
- The city-based bioeconomy should be further developed, in balance with rural areas.

Strong bioeconomy and circular economy competence base

- The competence base should be upgraded through a strong focus on life-long education and comprehensive research.
- To ensure knowledge and best practices are shared effectively, a strong focus should be placed on networking of research activities interacting with different stakeholders and raising awareness of their skills.

1. Introduction

Sustainable bioeconomy solutions will provide a foundation for well-being and competitiveness in Europe. To ensure that this can be achieved it will be necessary to implement and monitor the Commission's coherent strategic goals and actions.

Finland supports a revision of the EU Bioeconomy Strategy in 2018. The Bioeconomy Strategy is still highly relevant, particularly in the current context of circular economy initiatives, the Paris Agreement and the UN Sustainable Development Goals. We anticipate mutual benefit from such a revision, as was the case with the existing EU Bioeconomy Strategy (2012) and the Finnish National Strategy for Bioeconomy (2014). Finland firmly believes in the value of placing the bioeconomy on the list of top priorities, leading to a coherent and systemic new bioeconomy strategy.

The leading principles in the promotion of the bioeconomy should include the following: development through research, innovation and market-orientation, the profitable primary production, the sustainable use of bio resources, aim for simpler policy measures, removal of unnecessary administrative burden, and predictable regulation to attract investment and boost the economic upturn in Europe. Bioeconomy development should be carefully assessed in order not to compromise ecosystem services and health.

Finland's key recommendations concerning the drafting of an updated EU Bioeconomy Strategy and Action Plan are as follows: the logical links between the objectives should be specified; inconsistencies in definitions and use of terminology should be corrected; and a monitoring framework should be included, thus allowing a quantitative review to be made.

Finland is willing to cooperate with the Commission and the other Member States in as many ways as possible. The full potential of the bioeconomy will best be realised through broad-based cooperation between services, and by fully exploiting the synergies to be found at the interface between the bioeconomy and cross-cutting themes like climate change, the circular economy, digitalisation and industrial policy.

2. New business from the bioeconomy

New business can be generated by rethinking value chains, by risk financing and through bold experiments, by means of strong regional markets and the crossing of sectoral boundaries, and through the involvement of consumers.

The focus should be on maximising the value creation capabilities of both the bioindustry and bioservices and on their interaction, including the potential of ecosystem services. Ecotourism activities and the freshwater blue bioeconomy are examples of the growing business opportunities for Europe. Such capabilities should be seen in an integrated way, as

the distinction between services and manufactured goods in modern industry and value networks is often blurred.

A key initiative designed to take advantage of regional strengths is the Smart specialisation approach that aims to boost growth and jobs by enabling each region to identify and develop its own competitive advantages. Through a bottom-up approach, it brings together local actors for the implementation of long term strategies supported by EU funds.

For the bioeconomy to flourish EU policies and the Action Plans should further promote cooperative actions such as the use of side streams for various purposes across sectors (industrial symbiosis).

Consumers should be made better aware of bioeconomy products and services, their characteristics and quality, and the associated climate and environmental benefits. The strategy should also encourage research on the impacts of bio-based products over their lifecycle to ensure consumers' acceptance and sustainable use of resources.

Funding and investments are needed for basic research, applied research, near-to-market activities, and for rolling out solutions for diverse contexts.

The share of R&D&I funding for bioeconomy research and actions within the **EU budgetary framework should be increased**, as well as Member States funding and private sector R&D&I investment. Policies should consistently promote the uptake of bio-based innovations, through for example, public procurement and policy experimentation.

Open science and open innovation, as well as collaboration between academia and the private sector, should be embraced. Strategic innovations should be recognised and protected globally. Existing funding instruments should have the flexibility to boost also the cooperation and applied science research work between companies and research professionals within academia and research centres. This will accelerate the exploitation of research results, benefiting business and society at large.

Stakeholders, end-users and citizens should be involved in defining the research and innovation missions and measuring their progress and impact on the economy and on people's wellbeing. This could be done with digital, interactive communication platforms or using regional and national panels.

Appropriate financing mechanisms are needed for basic research, innovation and the commercialisation of new products. Funding and collaboration programmes, such as Horizon 2020, should continue to promote research and innovation on the bioeconomy and the circular economy, as well as the related business models and pilot projects. The next R&D&I programme, FP9, should focus more on implementation of the good results achieved on the bioeconomy and circular economy by providing funding opportunities for applied

sciences, cross-disciplinary studies and product and service development. Public-private partnership (PPP) funding opportunities, in particular the Bio-Based Industries Joint Undertaking (BBI JU), should be continued (BBI 2.0) and increased in the context of the next EU Framework Programme for Research and Innovation (FP9).

Financing mechanisms should also facilitate the development of product brands, immaterial rights and design. The benefits of digitalisation should be widely made use of for financing instruments or digital market places for materials and services. With the implementation focus, also skills and education of bioeconomy and circular economy should be strengthened for assuring knowledge pool and required digital skills for bioeconomy.

Under the EU state aid rules and rural development measures, Member States should be given sufficient flexibility in promoting the bioeconomy and the use of biomaterials within their territory. However, effective competition should be seen as the primary way to boost innovation and the competitiveness of the European bioeconomy business.

3. Accessibility and sustainability of biomasses

Securing the availability of renewable natural resources, well-functioning raw material markets and the sustainability of resource use are essential for the development of the European bioeconomy.

The continuity of business activity in the bioeconomy on a regional basis, which is a prerequisite for a sustainable bioeconomy, will depend on the profitability of production and services in the regional bioeconomy. With this in mind, primary production should, in Finland's view, be more closely involved in the preparation of both the EU and national bioeconomy strategies and action programmes. It is important that the economic wellbeing of the bioeconomy is spread widely and also supports the social sustainability of the regions.

Careful assessment of sustainable biomass resources and bio-based side streams and residues, their scale and different existing and potential future uses is needed as a foundation for a sustainable bioeconomy. Research and development funding is needed to improve the knowledge base concerning different biomass resources, including the potential for digitalisation.

The profitability of primary production is a prerequisite for the availability of biomass resources in the future. The use of databases on renewable natural resources should be enhanced to better understand and forecast European and global demand and sustainable supply of different biomasses, including side streams, residues and industrial biological production.

Finland welcomes the Commission's initiative to replace the Bioeconomy Observatory with Bioeconomy Knowledge Center. The Center should be able to provide evaluated data for decision-making and easy-to-understand communication material for promoting the bioeconomy to stakeholders and citizens.

The policy and legislative framework need to be rewritten to pave the way for versatile uses of biomass resources. The emergence of new bio-based products and technologies calls for a modernized policy approach regarding the use of renewable natural resources. The goals of technology development should include a focus on enabling different biomasses to be used even in the same process. This underlines the need to ensure coherence in different EU policies.

Services have a significant and growing role in the new bioeconomy value chains. Increasing service intensiveness, services associated with industrial products and side streams, and immaterial value creation are clear trends that will open up new business opportunities, in particular for SMEs, and encourage cooperation and partnerships between companies.

Natural values and the processes that maintain natural resources are vital for the bioeconomy. Nature and nature experiences are an important source of well-being, and services that are based on natural values and that promote good health are a growing sector. Tourism services also offer plenty of new opportunities for business and job creation that have not yet been exploited.

EU-policies should support the development of new technologies and innovations as part of a sustainable bioeconomy and guarantee a predictable and level playing field for new investments.

EU measures to ensure the sustainability of bioenergy should primarily rely on existing instruments, as proposed by the European Commission in the Clean Energy Package.

Ensuring competitiveness in digitalisation and the platform economy

Digital platforms are expected to capture between 30% and 40 % of the value created in industrial value chains. Europe has a lot of unlocked potential to transform and digitalise various business sectors by using the rapidly growing public and private data resources. Companies operating in the bioeconomy and circular economy sectors should be in the frontline, utilising these possibilities. For example, biomasses can be monitored digitally, like Biomass Atlas is doing in Finland. A further example is the testing of biomaterial and material waste in block chain platform marketplaces, which has been done in India.

In order to have more European platform-based business ecosystems led by European companies and expertise, we need to respond faster in the European Union to the speed of change and transformation brought by digital platforms.

We need to develop new collaboration methods, scalable pilots and faster commercialisation models through impact-focused mission-oriented PPPs that help European platforms and ecosystems to grow in the field of bioeconomy.

Europe needs to invest in knowledge, innovation and sharpening of our skills in order to successfully grasp the possibilities and take the lead in this crucial change. The agility to adopt new technologies is crucial, as is the ability to learn that renewal is the key for success in an era in which technologies emerge ever more rapidly and business disruption can be expected. Bio-based industry and the circular economy industry are in a good position to take the necessary steps towards a new digital era.

The aim is that it should be equally seamless for European companies to operate on digital markets outside Europe. Therefore, we need active European participation in forums that shape the operating environment of the platform economy on a global level.

4. Coherent policy environment and actions

The EU Bioeconomy Strategy should, above all, examine the opportunities to create markets for bioeconomy products and services. Finland believes that the bioeconomy **offers a central role for value creation** in the EU economy. Part of the potential of the bioeconomy will be realised through cross-cutting actions involving the circular economy, digitalisation and industrial policy.

The scope of the current EU Bioeconomy Strategy should be enlarged. The revised strategy should reflect in a balanced manner the opportunities that agriculture, forests, fisheries and water resources offer for sustainable growth. The potential of marine areas but also freshwater and inland waters should be noted.

Nature itself and the ecosystem services it offers are an integral part of the bioeconomy. These **nature-based services should be identified and secured** in promoting health, wellbeing and ecologically sustainable business and economic activities including tourism.

A sustainably managed biomass base will improve the performance of ecosystems and promote the production of other ecosystem services. Protecting the biodiversity and natural values is an integral part of the sustainable use of natural resources. The varying characteristics and context of the bioeconomy in different EU countries means that a **flexible policy framework** is needed in which **Member States can choose the actions most suitable to their national conditions.**

The EU Bioeconomy Strategy should continue to be primarily a *strategic tool* to guide the further development of the sustainable bioeconomy in Europe. This should focus on promoting the reinforcement of policy coherence concerning the circular bioeconomy and climate objectives. The bioeconomy and the circular economy are different but highly complementary concepts.

The revised strategy should reflect in a balanced manner the opportunities for sustainable growth of the bioeconomy offered by the Energy Union Strategy, the Common Agricultural and Fisheries Policies (CAP and CFP), the Integrated Maritime Policy (IMP), the Circular Economy Package and other environmental, industrial, employment, energy and health policies. Synergies and complementarities as well as suitable policy instruments and funding sources for enhancing the bioeconomy differ from one policy area to another.

A common framework is needed to evaluate critical policy measures, instruments and funding that either support or create barriers for bioeconomy growth. The opportunities for the bioeconomy should also be evaluated and included in an ex-ante impact assessment when a new relevant policy initiative is under preparation.

Internal and external policy coherence

Value chains and markets are global. All of the world's major economies are developing some form of bio-based vision and programme. Actions should be taken to examine the international opportunities of bio-based public procurement, to exchange information on best practices and to promote the joint development of supporting measures with countries outside European Union.

Actions should also include global harmonisation of the certification and labelling standardisation for bio-based products. This is of increasing importance as eCommerce makes products available to Europeans from all over the world, and these should be recognised by the reuse or recycling operator.

The implementation of policy options and actions to enhance the EU bioeconomy, including the circular bioeconomy, must respect the rules of the EU's trade agreements, including non-discrimination and avoidance of arbitrary restrictions to trade agreed as a fundamental principle of world trade. Action to this end also needs to be enhanced in future negotiations on the EU's bilateral trade agreements on bio-based products.

5. Competitive operating environment for the bioeconomy

While incentives for sustainable growth are needed, *regulatory burdens and barriers* should be avoided. New legislation should be introduced only to create a new market or to achieve a transition that is not yet driven by the market. European competitiveness can best be

enhanced by developing solutions to global challenges, such as climate change, by creating a functional internal market, by developing both the circular economy and the bioeconomy, as well as the synergy between these, and by promoting digitalisation and utilising European funding mechanisms in an efficient manner. Europe should take the role of globally leading solution provider.

It is of utmost importance that any EU-level measure or action genuinely adds value with a measurable impact on sustainable growth and employment, and is delivered with a minimum administrative burden. Certain aspects such as consumer protection must be assured, however.

The bioeconomy in the cities should be developed, in balance with rural areas. Cities are supported in their role as experimenters of the circular economy and the bioeconomy solutions and as platforms for the national action plan for the sustainable urban development. Support is needed for cities' initiatives for the circular and bioeconomy as well as clean solutions. The aim is to build forerunner networks with the PPP model. **The operating model of industrial symbiosis requires deep collaboration** between the stakeholders starting from the R&D phase and this is the key to the systemic change. To promote developments in the bioeconomy, the necessary logistics and infrastructural solutions need to be accounted for in land use planning.

The rural development programme includes measures to promote the circular economy and bioeconomy business possibilities in primary production and rural areas. To meet the growing demand for biomass-based products and exploit new ways to utilise material, residual and waste streams, businesses and farms must establish common value chains, and administrative barriers must be removed.

According to the EU Action Plan for the Circular Economy, guidance will be prepared for the so-called cascading use principle. Finland considers that cascading use as such is an important principle, but it is in many ways dependent on the varying circumstances and industrial structures in different Member States. **Because of the multiple interpretations of the cascading use of materials, this should not be incorporated into the legislation.**

Public procurement in Member States may be in a key position in creating markets. The potential contribution of cities and regions to the bioeconomy remains largely unexploited. Cities and communities in collaboration with researchers and companies can build sustainable demonstrators and promotion platforms to test and evaluate bio-based and circular economy products and services. Public-private partnership models (PPP) together with a coherent legal framework will further support this development. The Bio Based Industries Joint Undertaking (BBI JU) is creating unique opportunities for public and private organisations to cooperate, develop their knowledge and establish cross-sector connections to find new ways of valorising Europe's biomass potential.

6. Follow up and monitoring

Attention must be given to ensuring the quality of bio-based and recycled products. This will include looking at the way in which quality control is organised. The impacts of bio-based products over their whole lifecycle should be taken into account.

Research is required for safe practices and solutions as well as assessment of how these perform in terms of the various environmental impacts in different conditions. The lifecycles of both consumer products and B2B products provide an important foundation for metrics.

Taking into account the complex and cross-border value chains and their impact, it would not be possible to create one single indicator for monitoring and guiding the decision-making.

7. Strong bioeconomy and circular economy competence base

Bioeconomy innovations and new business require world-class expertise, research and product development. Research and the development of new networks for combining various aspects of expertise must cover the entire value chain, and they must be channelled for creation of high added value. A competitive bioeconomy requires the **creation of centres of expertise of a high international standard** and reform of the priorities and operating models of research.

The bioeconomy is a multidisciplinary entity where competitive solutions cannot be produced without consolidating several sectors and types of competence. New knowledge and expertise are continuously being created in the world. This requires measures such as **incorporating the bioeconomy theme in processes where decisions are made on strategic research priorities and themes in different institutions.**

The **Industrial Biotechnology Innovation and Synthetic Biology Accelerator (IBISBA) proposal is an excellent initiative** in this respect. Industrial biotechnology is one of the key enabling technologies (KETs) which will facilitate European reindustrialisation, economic growth and people's wellbeing. Joint research infrastructures and pilot facilities like IBISBA will accelerate the development cycle from lab to market and assist in overcoming the difficulties that are often faced at this stage.

Digitalisation of funding instruments and customer support

Substantial funding at the EU level is available. Nevertheless, the financial instruments are scattered and their role and coverage are often unclear. If improved internet tools were available, applicants (especially SMEs) for funding for research, innovation or investment would find information more easily on the funding opportunities and conditions.

Research themes

The post-2020 EU R&D&I programme should translate global societal challenges (social, economic, environmental) into a limited number of large-scale research and innovation 'missions' including research, applied studies and actions to take the results to businesses and create growth and wellbeing.

The research themes should be easy to communicate and induce action across disciplines, sectors and institutional silos; they could be modelled after the UN Sustainable Development Goals; and they should have transformative potential and be measurable.

Bio-Based Industries Joint Undertaking (BBI JU)

The Commission should renew the mandate of the BBI JU for the next framework programme, and should keep the current concept "industry in the driver's seat" in defining the vision, target, and agenda.

The Bio-Based Industries Joint Undertaking (BBI JU), created in 2014, within the EU's The Commission should renew the mandate of the BBI JU for the next framework programme. Moreover, in defining the vision, target and agenda, the Commission should retain the current concept whereby industry is "in the driver's seat".

The Bio-Based Industries Joint Undertaking (BBI JU), created in 2014, features within the EU's Bioeconomy Strategy and Horizon 2020 framework as a public-private partnership aimed at creating a competitive and sustainable bio-based industry sector in Europe. This is especially worth highlighting, and follow-up action should be taken after 2024. The BBI JU has been an excellent initiative in bringing about innovations in the bioeconomy. It has achieved high levels of effectiveness, implementation and transparency, with an impressive 36% SME participation rate and high satisfaction rate from participating coordinators. This provides a strong platform for further monitoring and follow-up actions.

The figures clearly demonstrate that the BBI JU is successful in organising, structuring and shaping new value chains, de-risking private investment and reaching the critical mass needed to create value for Europe and its citizens.