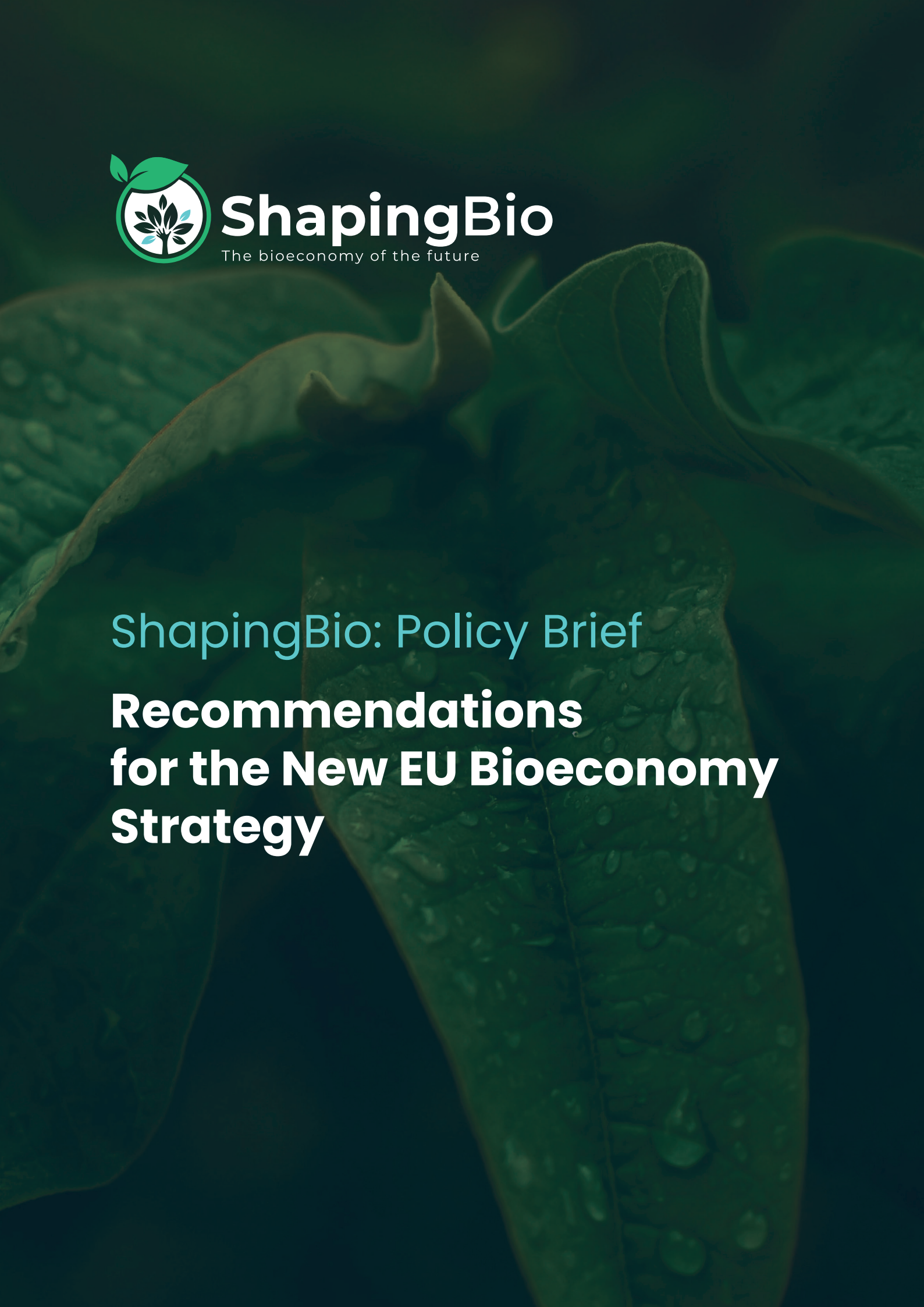

ShapingBio
The bioeconomy of the future

ShapingBio: Policy Brief

Recommendations for the New EU Bioeconomy Strategy

Key Policy Recommendations

- For a globally competitive European bioeconomy sector, coherent strategic approaches to bioeconomy must be taken throughout the EU to exploit its diverse strengths synergistically. This requires improved coordination horizontally and vertically and intensified quintuple helix stakeholder dialogues.

- Access to financing has to be improved along all stages of the innovation chain to enable companies to move from lab to fab. Funding conditions should be better aligned to innovators' needs. Funding instruments for activities on higher TRLs as well as Public-Private-Partnerships should be expanded.

- Better market conditions are essential for the deployment of bio-based products and to realize their potential to address sustainability challenges. Therefore, the EU bioeconomy strategy should anchor a coherent policy mix for bio-based products with additional economic demand-side instruments and more harmonized market conditions for bio-based products.

About SHAPINGBIO

ShapingBio is an EU-funded project with the overall aim to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states.

ShapingBio aims to provide evidence-based and concrete information and recommandations for better policy alignment and stakeholder actions to realise the cross-sectoral potential of the bioeconomy and to reduce the fragmentation accros biobased sectors and the food system, as well as in policies accross regions, domains and governance levels.

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A thriving sustainable and circular bioeconomy

Bioeconomy offers a more sustainable path towards the solution for grand challenges, such as caused by an increasing population, climate change and biodiversity loss or the transgression of planetary boundaries. Due to its cross-sectoral nature, the bioeconomy directs our fossil-based market system towards more sustainable production and consumption patterns in all economic sectors. Although bioeconomy holds huge potential for a sustainable future, there is urgent need to advance bioeconomy in all European member states and their regions further. The ShapingBio project[1] has outlined key recommendations for a more coherent and competitive bioeconomy across the European Union. It aimed to gain a deeper understanding of its innovation ecosystem and provided specific measures that the European Union, all Member States and other key players can adopt to strengthen the bioeconomy innovation system.

The findings and recommendations presented in this policy brief are based on the triangulation of different data sources, such as comprehensive desk research, surveys, in-depth interviews and intensive engagement throughout 45 events with around 2,000 key bioeconomy decision-makers, experts and stakeholders from all over the EU between 2022 and 2025.

Our recommendations underscore the urgent need formulated by the Commissioner for the Environment, Water Resilience and a Competitive Circular Economy, Jessika Roswall to make collective efforts for building a thriving sustainable and circular bioeconomy and to include the needs of all bioeconomy stakeholders. The European Commission has highlighted four strategic pillars where impact is needed, and which prospectively will be covered by the upcoming New Bioeconomy Strategy:

- A globally competitive European bioeconomy sector
- Creating efficient demand for more value from less resources
- From lab to fab – priorities for scaling up
- Securing sustainably sourced biomass supply

In this respect, our policy brief outlines selected key recommendations developed in the ShapingBio project that address three[2] of these four strategic pillars. We aim to support EU bioeconomy decision-makers with these recommendations to translate key objectives of the new bioeconomy strategy into concrete actionable steps.

[1] ShapingBio has published several thematic reports as well as a recommendation Deliverable. All files are available under https://www.shapingbio.eu/resources/.
[2] While biomass supply has been considered in the ShapingBio analysis, it has not been the scope of the CSA to provide recommendations for this pillar. Instead, this issue has been adressed by several other CSAs.

A globally competitive European bioeconomy sector

The EU has unique strengths in bioeconomy as a whole: in the production of diverse bio-based feed-stocks, in its bioeconomy infrastructure and being strong in different biomass converting industries across the Member States and regions. However, Member States differ significantly in innovativeness, R&D activities and infrastructures, and whether they have developed and implemented a coherent strategic approach to bioeconomy policy on national[3] and/or regional levels. To strengthen its industrial capabilities and to maintain global competitiveness, the EU has to tackle this heterogeneity and realize its full potential across all Member States and regions.

Make the bioeconomy concept more generally known, enhancing the legitimacy and priority of bioeconomy

The EC should continue to encourage and support all quintuple helix stakeholders to increase awareness of the holistic bioeconomy concept among key decision-makers, bioeconomy stakeholders and the wider public outside the bioeconomy community. To provide convincing evidence of bioeconomy benefits, the EC should drive efforts to boost the visibility of bioeconomy impacts.

Support all Member States and more regions to adopt a coherent strategic approach to bioeconomy

The EC should continue to encourage and support EU Member States and regions without a bioeconomy strategy or only narrowly confined, sectoral ones to develop holistic, coherent bioeconomy policies with dedicated bioeconomy strategies. Implementation options comprise e.g. initiatives, Coordination and Support Actions (CSA) and policy networks. The EC should continue to support especially moderate and emerging innovator Member States[4] to enlarge their bioeconomy innovation capacities by networks, hubs, Strategic Research and Innovation Agendas and by partnerships between Member States and regions with different innovation profiles.

Improve coordinated implementation of bioeconomy policy

The EC should continue its efforts to coordinate its bioeconomy policy across the involved DGs, to ensure that bioeconomy specificities are taken into account in related strategies, action plans and acts[5], and to exploit synergies between them. The EC should also support EU Member States and their regions in their efforts to improve coherent bioeconomy policy implementation by both its horizontal coordination between the responsible ministries and with related policy fields and strategies, as well as its vertical coordination across geographical governance levels. Options that could be considered are e.g. commissioning studies what good practice strategies and coordination entails, evaluations, Coordination and Support Actions (CSA), exchange of good practice in suitable fora (e.g. conferences, European Bioeconomy Forum, CBE JU group of national representatives, OECD, G20).

Sustain multi-actor approaches and dialogues

The EC should sustain a multi-actor approach in bioeconomy that fosters iterative dialogues among quintuple helix stakeholders. The EC could consider the option of a future-oriented Bioeconomy Dialogue modelled after the Strategic Dialogue on the Future of EU Agriculture, followed by a European Board on Bioeconomy, similar to the European Board on Agriculture and Food. The EC should encourage and support Member States to also conduct multi-actor approaches and dialogues. The main objective of this approach is to cultivate a culture of engagement, collaboration and co-creation, ultimately enhancing the commitment to collaboratively advance a sustainable, resilient, and competitive bioeconomy. Specific attention should be paid to actively involve stakeholder groups which have been weakly represented so far (e.g. primary sector, youth), and to enhance cross-sectoral dialogues and collaboration.

Strong business climate and innovative bio-based SMEs are indispensable for the transition to the bioeconomy. Of decisive importance for

[3] Taking the existence of a dedicated bioeconomy strategy as indicator for a coherent strategic approach to bioeconomy, only 11 EU Member States have published such a policy document (Austria, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, the Netherlands, Portugal, Spain (status in April 2025)).
[4] Categorization according to the EU Innovation Scoreboard.
[5] Start-up and Scale-up Strategy, Life Science Strategy, Biotech Act, Circular Economy Act, Ocean Pact.

spin-offs, start-ups and other SMEs is access to financing to start and scale up their business and enter the market. A significant range of different public and private financing instruments exist which are important for bioeconomy SMEs. However, access to private financing is far from easy for SMEs: on the one hand, the bioeconomy field lacks transparency for investors, because it is heterogeneous regarding technologies, regulations, markets and even different terms are used in funding schemes, studies etc. On the other hand, bioeconomy investments often present higher risks for investors than investments in other technology fields.

Better tailored support for start-ups / companies along their development journey

Regarding start-up funding, the EC and the majority of the EU Member States should streamline the pathway to commercialisation by creating specialised funding schemes that provide early-stage capital to bioeconomy startups, particularly for spin-offs emerging from universities and research institutions. Support should be tailored to the development stage of the companies: in early phases, help should especially be offered to acquire public finance and to build up business skills. In later stages, support should be targeted at acquiring private investments. Moreover, the existing public equity schemes with relevance to the bioeconomy should not only be continued but ideally expanded to match the expected growing investment need regarding the well-filled innovation pipeline in the bioeconomy. It should be ensured that these funds have specific expertise in the various fields of the bioeconomy, especially if they are not dedicated to bioeconomy alone.

Elaborate common terminology

As a supportive measure, the EC should drive the harmonisation and standardization of bioeconomy terminology (technology nomenclature) across the EU for regulatory and funding frameworks. This refined nomenclature could then be incorporated into funding calls at the EU, national, and regional levels, integrated into regulatory frameworks, and adopted in private market assessments, studies, and other relevant analyses.

From lab to fab – priorities for scaling up

In the knowledge-based bioeconomy, effectice knowledge and technology transfer is a key prerequisite to move from lab to fab. It remains an ongoing challenge to better align activities in academia and industry and intensify collaboration between them.

Create more favourable conditions for academics in the bioeconomy-related research and collaboration with industry

Academia, comprising natural sciences, engineering, and social sciences and humanities disciplines, should be encouraged by the EC, national and regional funding policies to perform inter- and transdisciplinary research, and to establish and broaden a collaborative culture with industry and practitioners. One option is to apply a broader set of performance indicators for career pathways and for resource allocation (e.g. personnel, budget, equipment) in the bioeconomy (e.g. patents, membership in industrial networks or company advisory boards, track record of founding companies, co-publications with industry, non-academic publications). In addition, industry associations and collaborative structures should act as facilitators for establishing communication between academia and industry so that both sides understand each other's needs and interests and build trustful relationships and implement together a more demand driven research approach.

Open-access, multipurpose, and shared pilot and demonstration infrastructures (PDIs) are vital in bridging the gap between laboratory innovation and industrial-scale application. These facilities enable faster, more cost-effective, and higher-quality scale-up of innovative bioprocesses, significantly reducing the risks for scale-ups and SMEs in their innovation journeys.

Europe is home to a robust network of over 120 PDIs, capable of supporting the scale-up of a wide range of bio-based innovations from Technology Readiness Level (TRL) 4 to TRL 7. This network spans 12 technology domains and encompasses more than 50 distinct technologies. Between 2022

and 2024, these infrastructures have undergone substantial expansion, ensuring sufficient capacity to meet both current and future scale-up demands. The Pilots4U community, which connects these infrastructures, represents a strategic asset that can drive European competitiveness and accelerate the deployment of large-scale biomanufacturing.

Promote and leverage the European PDI network

Raise awareness of the Pilots4U community and its capabilities. Foster stronger integration of the network into EU, Member State, and regional initiatives. Prioritize investments to maintain the technological edge of the existing 120+ PDIs, focusing on demand-driven upgrades rather than duplicating existing capacity across Europe.

Enhance derisking for innovators

Strengthen support mechanisms such as co-funding schemes (e.g. innovation vouchers) to lower barriers to accessing open-access pilot and demo facilities. By reducing the technological risk of scaling up bioeconomy innovations, these measures can boost private investment. Encouraging cross-border use of regional and national funding schemes will allow SMEs to access the most suitable scale-up facilities across Europe, regardless of location.

Partly in parallel to the stages above, but mostly for the scaling-up (from TRL 8) phase to commercial production a well-designed public support is important to derisk private sector investments and build up biomanufacturing capabilities and capacities. There have been advances in recent years on the EU level (CBE JU) and in a few Member States for funding high TRL-activities providing well-designed public support to derisk private sector investments.[6] However, a more comprehensive funding landscape in the bioeconomy is needed that covers the needs of the companies in their progress in the innovation development chain for scaling-up from low TRLs to commercial scale.

Ensure continuous funding possibilities throughout the innovation chain

To ensure that critical long-term projects can acquire continuous financing and investment that is tailored to their changing needs over time, the EC and national and regional funding agencies should set up funding frameworks that allow innovators to apply for support at different TRLs and different stages of their lifecycle, from scale-up to commercialization. This could be either provided by a consistent funding portfolio, closely interacting funding agencies, and highly harmonized administrative funding procedures. Another option are funding schemes (e.g. on EU level related to EIC or EIT) that are milestone bounded. This approach aligns funding calls with specific developmental, market, or technological achievements, promoting strategic and measurable progress. It should be combined with an increasing request for private contributions (e.g. from investors).

Establish more public-private partnerships (PPPs) activities aimed at bioeconomy sectors

These PPPs can use CBE-JU as a good example and could be implemented either as expansion or complementary to CBE-JU. They should focus on derisking mechanisms, such as access to market and large scale biomanufacturing support, to lower the entry barriers for private investors and to increase cross-border collaboration. Specific attention should be paid to appropriate inclusion of countries with moderate innovation capacities, but high biomass feedstock potentials. Moreover, IPCEIs[7] are a powerful cross-national tool to address finance needs for large scale implementation of the bioeconomy. Therefore, the implementation of the ongoing IPCEI activities related to the bioeconomy is encouraged.

[6] E.g. Germany and Ireland have introduced explicit programmes for funding bioeconomy activities at high TRLs, covering demonstration activities or in case of Germany even the construction of commercial plants.
[7] An IPCEI (Important Projects of Common European Interest) is a transnational project of common European interest that makes an important contribution to economic growth, employment, competitiveness and resilience of the European industry and the economy through state funding.

Creating efficient demand for more value from less resources

Market development in the bioeconomy is essential for driving innovation, generating economic growth, and potentially to address environmental challenges, as it enables the translation of scientific advancements into commercially viable products. Typically, bio-based products face higher production costs compared to conventional industries and bio-based products face regulations, infrastructure, user practices and preferences that are only aligned with the needs of existing (usually fossil-based) technologies. Hence, demand-side policies to foster bio-based products are needed and justified. Today, such policy instruments are highly scattered in terms which geographical areas in the EU are covered, which bio-based product groups are addressed, and which instruments are used. Currently, a range of these policy instruments are discussed at EU-level and few Member States, focusing on quotas, modification of existing emissions-trading systems or additional ones that favour biogenic carbon or better GHG-emission performance of bio-based products.

In a similar vein, the administrative and regulative framework should provide fair chances for new bio-based innovations. Using the example of sustainable aquaculture, the ShapingBio analysis showed that additional significant regulatory and administrative hurdles may exist in the phase of obtaining authorisations, permits, licenses and surveillance for establishing production facilities and production processes. This is especially the case if the innovations are situated at the interface of different traditional sectors and policy fields. The challenges are enlarged by the observed heterogeneity across EU Member States and/or regions regarding the respective regulatory and administrative environments as well as the number and expertise of the responsible administrative authorities. Hence, for many innovations, there is no common market with similar regulatory and administrative processes yet.

Implement strategic demand-side policies

The EC and its Member States should put stronger emphasis on demand-side policy and economic instruments for bio-based products and services. A coherent policy mix ideally consists of several measures, ideally disincentivizing use of fossil products (e.g. by higher taxes or reduced subventions) and simultaneously incentivizing bio-based products. It must comprise well-balanced measures and instruments for achieving the intended objectives, for minimizing unintended effects and trade-offs, and for overcoming stakeholders'concerns. For the design of those instruments which focus on bio-based products, a clear strategy is needed. Such a strategy must either prioritize selected biomass use pathways or define criteria which must be fulfilled by the respective product (e.g. certain environmental impacts). Synergies and coherence with other strategic activities (e.g. circular economy, public procurement, energy policy) should be ensured as well as potential effects on market structures considered in implementation.

Address regulatory and administrative challenges early

A holistic and coherent bioeconomy policy must anticipate such regulatory and administrative challenges and disincentives early in the innovation process, e.g. by commissioning studies and analyses, by foresight exercises, by dialogues with innovators, regulatory and administrative experts, by mapping and analysing relevant regulatory frameworks, administrative responsibilities and procedures. Anticipated challenges then need to be proactively addressed with appropriate measures and harmonized across the EU Member States. These measures could comprise – among others - regulatory sandboxes, harmonisation of approaches, capacity building and qualification of staff, issueing guidance for applicants, establishing one-stop shops, streamlining and digitalisation of administrative procedures, establishing platforms for mutual learning, knowledge and good practice exchange.

ShapingBio

The bioeconomy of the future

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