



# RDI priorities to accelerate demand for biobased solutions in the EU

## SCAR Bioeconomy SWG Position Paper

### Introduction

#### Polycrisis and enhanced role of the bioeconomy in Europe

The COVID-pandemic and the recent geopolitical turmoil have exposed the vulnerability of European economies, which rely heavily on imported production inputs. We are facing polycrisis in a sense that many different challenges are happening at the same time, and their short and long term solutions need more proper understanding. The significance of the security of supply to ensure the functionality of our societies in Europe has drastically increased. Improving the **security of supply**, especially in terms of raw materials and inputs for energy and food, needs both immediate actions and longer-term planning.

**Bioeconomy**, rooted in renewable natural resources can address these challenges. It contributes to **material and energy stability** by maintaining a circular flow of materials and objects, thus avoiding resource exhaustion. It increases not only security of supply, but also resonates with the pursuit of climate and biodiversity objectives. Economic, social, climate and biodiversity aspects can be reconciled in the bioeconomy.

The EU's strategic commitments towards a systematic and accelerated transition to a circular bioeconomy indicate positive developments. Progress has been made in terms of accelerated economic growth and competitiveness of core bioeconomy sectors. Bio-based technologies and materials are being gradually mainstreamed into a growing number of industries previously relying solely on fossil-based raw materials. However, as Figure 1. reveals, the sectors' contribution to the overall economic performance of bioeconomy structure remains static, suggesting that the potential of bioeconomy is not yet fully exploited in terms of achieving higher added value from sustainable and circular biomass processing.

## Bioeconomy - value added (million EUR)

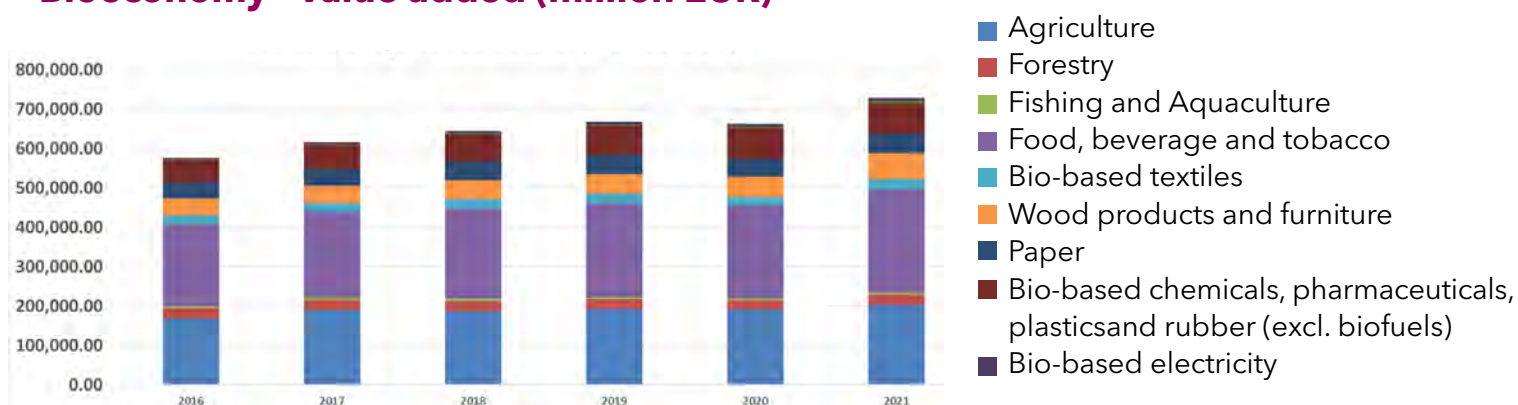


Figure 1: Development of value added in bioeconomy sectors (EU27, 2015-2020)  
<https://datam.jrc.ec.europa.eu/datam/mashup/BIOECONOMICS/index.html>. Accessed on 21/02/2024.

Open strategic autonomy aims to enhance Europe's sovereignty in technologies and crucial value chains while participating in global trade and cooperation. The green transition, enabled by sustainable primary production, food systems and extended circular biobased value chains, ensures the security of supply but also helps meet climate and biodiversity targets. Increasingly frequent and intense consequences of climate change force us to accelerate the transition from a fossil-based economy to an economy and society based on renewable carbon and energy. Transition to renewable and biobased technologies and materials plays a key role in this respect. Integrating bioeconomy into the EU industrial policy by enabling strong regional circular bioeconomy ecosystems is seen as one of the key engines of fostering EU competitiveness worldwide. The current EU Bioeconomy Strategy supports the objectives above by fostering biobased value creation and synergies across Europe and attracting investment, while respecting ecological boundaries.

## Biobased demand – from the obstacle to the engine of growth



In general, the dynamics of demand for sustainable products is often not reflecting the rate of necessity dictated by the challenges listed above. Moreover, recent developments (economic stagnation, geopolitical instability) may lead to (geographical, social) disparities in demand for sustainable products, or even backsliding in terms of demand growth trends over the last decade.

Biobased products, derived from renewable biological resources, are gaining prominence in various industries due to their potential to reduce dependence on non-renewable resources and mitigate environmental impacts. As the demand for biobased products continues to grow, it is imperative to address research gaps and identify key needs to foster sustainable development in this domain.

With this in mind, **Unveiling the demand side** has been identified as one of the three focus areas of the current (2023/24) mandate of the SCAR Bioeconomy Strategic Working Group (SCAR BSW). Under this focus area, SCAR BSW set itself a task to investigate the previous research work to determine the status quo of our understanding of the dynamics and drivers of biobased demand. This was made possible by carrying out by **Portfolio analysis**, implemented by SCAR Support Team in June 2023. Findings of the Portfolio analysis provided a basis for further exchange within SCAR BSW. The aim was twofold: first, to identify RDI

gaps and needs in our understanding of demand for biobased technologies and products in the EU; and second, to propose concrete actions that would address these needs and gaps. The main findings are utilized in this Position paper.

Understanding how to keep the growth momentum of the demand for sustainable products is the core challenge addressed in this position paper. We need to improve our understanding of the functioning of intermediate (business-to-business, B2B) and final (business to consumer, B2C) demand along extended biobased value chains in often challenging market settings. This should allow us (i) to develop policy tools and instruments to bridge barriers and incentivize demand for biobased products/technologies and (ii) to identify and create conditions for 'social tipping points' on the demand side will accelerate the transition to a sustainable biobased economy.

## Three RDI goals - going beyond the obvious



**Review market trends, acknowledge game-changers on the demand-side and improve understanding of consumer preferences.**

**Justification:** There is a strong and continuous need for actions to improve the level of knowledge at the consumer level, in order to respond quickly to changing customer demands, and optimize the value chains. Further there is a need to find ways for incentivizing consumers that their generally positive attitude towards sustainable biobased products will translate in their purchasing behavior.

### **Actions:**

- Ex ante impact assessment of the trends including consumer habits, innovations, policies and regulations, value chains now and in the future and the change in the operational environment is needed in order to better understand factors affecting consumer awareness, perception and preferences via interdisciplinary approach.
- Creating awareness among consumers, public stakeholders and policy makers by enterprises that are members of cooperations, clusters, or networks. Just but better quality: Reasons for not choosing the higher price option do include lack of financial

resources, lack of information about the added-value or simply different purchasing priorities.

- Investigating further the innovation ecosystem which is necessary to fully address the role of consumers in bio-based value chains and the factors affecting consumer awareness and perception towards biobased products. This includes measures to bridge the well-known gap between intention and taken action to buy more sustainably, other than lower prices. Training and education are crucial factors in this process. However, question remains on how biobased sustainable brands could become attractive and capable to effectively influence consumer preferences.
- Providing transparent, reliable, and accessible information to contribute to shifting social norms towards sustainability, taking into account the role of consumers as influencers and game-changers (positive and negative).



## GOAL 2

### Identify and develop innovation for end-user engagement in the process of developing bio-based products and services

**Justification:** Research and innovation actions are needed to assure the transition to sustainable biobased value chains from primary production to consumption. This implies involving customers in the early stages of biobased products development, revealing and incorporating their needs and expectations in the design of the product.

#### **Actions:**

- Engaging consumers in early TRL stages of bio-based products and services in order to address the risks & benefits seen from the consumer perspective. Creating new knowledge as a service concepts for bioeconomy.
- Creating better access to real-time information on biomass availability, transport logistics, market trends, and collaboration opportunities for SMEs in the industries. The platforms and networks have the role of enabling SMEs to make informed decisions, expand their markets, and leverage collaborative synergies. This should provide new regional knowledge and possibilities eg for the Eastern European Bioeconomy.
- Addressing new expectations through a higher level of cooperation, the development of consumer-driven business models and digitalization via B2B New trends in consumer requirements include personalization, higher demands on service and innovation, omni-channel availability, faster delivery.

- Developing of new collaboration and data sharing tools for the future bioeconomy through RDI on digitalization such as internet of things (IoT), analytics, artificial intelligence (AI), robotics, high performance computing (HPC), augmented reality (AR), virtual reality (VR).
- Addressing the specific role of consumers within the business model environment of a circular bioeconomy in future research from a conceptual and empirical perspective. When it comes to the role of consumers in innovating business models or new circular bioeconomy business model creation a conceptual shift of attention is needed from a short-term perspective seeing consumers as primary target group of business models to a paradigm which perceives consumers as active stakeholders with decisive roles for sustainable business model innovation.



## Coherent and forward-looking bioeconomy regulatory frameworks including traceability and transparency actions

**Justification:** Envisioning bioeconomy framework, this enforces a seamless alignment of sustainable food, forest, and renewable energy systems, bolstering the region's ecological and economic resilience.

### Actions:

- Overcoming gaps and overlaps in labeling, standardization and certification systems for bio-based products, hindering collaboration between industries and impeding consumer acceptance of bio-based products.
- Developing protocols for standardized data collection, integration, and interoperability for improved logistics optimization, including decision support tools for out-of-the-box approaches (eg. sufficiency LCA).
- Developing systems to improve consumer information and communication through accurate labeling and digital means to boost consumer confidence and help industry stakeholders.
- Developing of tools and procedures that provide regulatory compliance support for SMEs.
- Developing of systems of incentives based on rewards for end-users to incentivize investments in low-carbon and zero-waste technologies.
- Developing systematic nexus between industrial, financial and bioeconomy policy.

Addressing the research gaps and needs in the biobased industry is fundamental to its sustained competitiveness and environmental and societal benefits. Circular and sustainable bioeconomy should be better integrated to industrial and finance policies via targeted RDI effort to unlock the potentials of biomass, ensure European green transition and security of supply.

Goals stated above can be achieved only through interdisciplinary collaboration and foresight. These are essential enablers for a transition towards more sustainable use of biomass, security of supply, and European competitiveness.

*Authors: Johanna Kohl, Luka Juvančič, Martin Behrens,  
co-chairs of the Bioeconomy SCAR working group.  
Special thanks for the Bioeconomy  
SCAR group members for their input.*



**SCAR**  
Standing Committee  
on Agricultural Research



Bioeconomy Strategic  
Working Group