

## Probing the European bioeconomy's development through its drivers and indicators



*Partners from the BioMonitor project published its latest paper in the Sustainability journal on the drivers and indicators that will measure the development of the bioeconomy*

The COVID-19 pandemic shifted the tectonic plates that once stabilised economic growth around the globe. Partners from the BioMonitor project wrote a [paper](#) that examines closely the driving factors, and the indicators that will allow us to measure the bioeconomy's development. This is part of the [Sustainability's Special Issue](#) on "Accelerating Bioeconomy Growth through Applied Research and Policy Change".

A lot of changes have happened since the EU's Bioeconomy Strategy Update in 2018. The European Commission a series of important policies such as the EU Green Deal and the EU Biodiversity Strategy. These were followed by the pandemic which struck the entire world. All these chain of events illustrate the value of the bioeconomy as it can provide an alternative solution for the world's economy including Europe's. It must however be sustainable, and therefore meet the United Nation's Sustainability Development Goals (SDGs).

### **What makes the bioeconomy sustainable?**

The BioMonitor project wished to answer this question through its latest scientific publication.



Colleagues from Wageningen University and Research (WUR), Royal Netherlands Standardization Institute (NEN), Statistics Netherlands (CBS), European Forest Institute (EFI), nova-institute GmbH, and the Technical University of Munich (TUM) wanted to know how the European bioeconomy works inside-out by first looking at the bigger picture and then dissecting it into parts in the form of bio-based sectors.

They analysed driving factors of the bioeconomy, and identified indicators that are either already linked to the objectives of the EU's bioeconomy strategy, or those that measure the impact of changes in supply, demand drivers, resource availability, and policies on sustainability goals.

We took the opportunity to ask Maximilian Kardung from WUR a few questions related to the paper.

***If there are existing driving forces within the bio-based sector such as technology and innovation, market organisation, climate and environmental change, demographics economic development and consumer preferences, will these efforts become futile without the support of policies, strategies and legislation?***

**MK:** The driving forces that we analyzed in the paper are going to develop in one way or another also without the support of policies, strategies, and legislation, thus government measures. At the moment, several government measures are already implemented. The key challenge for policy-makers with the support of policies, strategies, and legislation lies in steering these driving forces in a way which promotes the growth of the bio-based sector sustainably while not creating too much dependence on direct government support.

***How important is the collaborative efforts between the public and the private sector in order to make the bioeconomy sustainable?***

**MK:** Collaboration between the public and private sector is vital to make the bioeconomy sustainable. **The bioeconomy is not sustainable by nature and bio-based products are not always more sustainable than fossil-based products.** But it is also not easy for companies to produce bio-based products that are competitive with fossil-based products. Many of the biotechnologies needed for developing the bioeconomy are heavily regulated in the European Union. So, collaborative efforts between the public and the private sector can help address the problem, while ensuring it is done in a sustainable manner. We have already seen the European Bio-Based Industries Joint Undertaking as a crucial EU policy initiative that works as a Public-Private Partnership.

***How will societal objectives help stakeholders in their decision-making endeavours?***

**MK:** Decision-makers often have to make difficult choices, which have various impacts on society, the environment, and the economy and trade-offs between them. Therefore, it is crucial for them to see how their decisions affect the progress towards their policy targets, which are reflected in the societal objectives.

***Is there still a lack of synergy between the bioeconomy and the circular economy?***

**MK:** I would not say that there is a lack of synergy, but it is crucial to promote the synergies between the bioeconomy and the circular economy to achieve a sustainable economy. We deliberately talk about a circular bioeconomy in our paper, because we strongly recommend using the circular economy's principles in the bioeconomy. Minimizing bio-waste and maximizing the cascading use of



biomass, that is, using biomass several times in a cascading sequence, is essential to increase the efficiency and sustainability of the bioeconomy.

***How challenging was it to define the set of indicators which you listed in the paper?***

**MK:** Defining our set of indicators was indeed a big challenge. The bioeconomy is large and has a variety of impacts on the rest of the economy, as well as the society and the environment. We analyzed existing literature to see what indicators are already used or at least proposed to monitor the bioeconomy and found a very long list of indicators. But if you use too many indicators, a monitoring framework becomes overloaded and not useful for decision-makers. Therefore, we had restricted ourselves to a maximum of 25 indicators considering several criteria we describe in the paper, such as our focus on the bio-based industry. This meant we also had to leave out some indicators that others might regard important as well.

***Do you think that new gaps within the monitoring framework will show up in the future if the current regulatory environment fails to adapt quickly?***

**MK:** We hope that we can close some gaps with the monitoring framework we are proposing in the paper. Together with other efforts, for example, the recently launched EU Bioeconomy Monitoring system, we can support decision-makers to assess and steer the driving forces and promote growth of a sustainable circular bioeconomy. However, this also requires collaboration with statistical offices to collect more differentiated data on a product level, at the country and on the regional level. If the data collection does not differentiate between bio-based products and fossil-based products, this limits our ability to provide a more detailed picture of the bioeconomy.

The information provided in this paper have been published by the BioMonitor project in a more digestible manner in the form of a [policy brief](#). This study allows us to build our data ad modelling framework which will close the data gap observed when measuring the bioeconomy, and guide decision makers in defining their long-term strategies.

It will also serve as complimentary information to the [EU Bioeconomy Monitoring system](#), a platform that was launched recently at the [Global Bioeconomy Summit 2020](#) and in which the BioMonitor project was actively involved in.

**Reference:**

Kardung M., Cingiz, K., Costenoble O., Delahaye R., Heijman, W., Lovrić, M., van Leeuwen, M., M'Barek, R., van Meijl, H., Piotrowski, et al., Development of the Circular Bioeconomy: Drivers and Indicators. *Sustainability*, Volume 13, Issue 1, January 2021

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BioMonitor project has received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement N°773297