

## Bioeconomy: A sustainable development strategy

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Developing the bioeconomy offers a significant opportunity for achieving the Sustainable Development Goals (SDG) at the global level. Simultaneously, it serves as a strategic instrument for addressing new challenges emerging from the COVID-19 global crisis. Advances in science and technology and existing experiences support these expectations in this sense. However, effective progress will only be possible if national strategies evolve within a coherent and harmonized global framework. The Group of 20 (G20) has a strategic role in promoting this transition not only among its members but within the broader development community. Three specific lines of action are proposed in support of this transition: (i) a broader agreement on guiding principles for global bioeconomy policymaking; (ii) a framework of credible bioeconomy indicators; and (iii) an effective bioeconomy knowledge management platform.

### Challenge

The world faces the challenge of responding to not only the new issues emerging from COVID-19 but also those related to climate change and rising restrictions on natural resources, while sustainably meeting a growing demand for energy and food. There is mounting evidence that the business as usual approach implicit in the current energy and industrial matrix is no longer a viable option, and there is the need to find alternatives. In this context, the bioeconomy—understood as the knowledge-intensive use of biological resources for the production of products and services across all sectors of the economy—is becoming mainstream as a strategic vision for economic and sustainable development. The gradual replacement of non-renewable fossil resources in industrial production and energy supply with renewable biogenic feedstock could pave the way for a more sustainable, resource-efficient economy. This will offer opportunities to support growth and jobs and address climate change, food security, and resource depletion (OECD 2018a). In this sense, the bioeconomy is an idea closely related to the circular economy, although, from the sustainability perspective, it exceeds this idea. While the circular economy focuses on cascading to extend life cycles and minimize residues, the bioeconomy is circular by nature, as it is driven by the objective of the replacement of fossil resources (Carus 2020). Today, it is increasingly considered as the means for achieving key Sustainable Development Goals (SDGs) related to food security and nutrition, health and well-being, and clean water and sanitation, among others (von Braun 2013; IICA/FAO/CEPAL 2019; See Table 1 below).

#### Bioeconomy contributions to the Sustainable Development Goals

Table 1. Potential contributions of the bioeconomy to the SDGs

Potential Contribution	SDGs that contribute
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Productive models that take advantage of science and technology to use biological resources sustainably and efficiently to make substitutes for petrochemicals (for example, bioenergy, biofertilizers, or bioplastics) or to satisfy new consumer demands (for example, functional foods or biocosmetics).	SDG 2: Sustainable Food Production SDG 3: Good Health and Well-Being SDG 7: Affordable and Clean Energy SDG 9: Industry and Innovation SDG 13: Climate Action
Use of productive practices that contribute to environmental sustainability and resilience while adding productivity and efficiency.	SDG 13: Climate Action SDG 15: Life on Land
Circular economy production systems, through the productive use of waste biomass derived from production and consumption processes.	SDG 11: Sustainable Cities and Communities SDG 12: Responsible Consumption and Production
Development of products, processes, and systems replicating processes and systems observed in nature.	SDG 9: Industry and Innovation SDG 14: Sustainable Use of Underwater Biodiversity SDG 15: Sustainable Use of Land Biodiversity
Bioremediation to face environmental contamination problems (for example, recovery of degraded or contaminated soils, and treatment of water for human consumption and wastewater).	SDG 6: Clean Water and Sanitation SDG 15: Prevention of Soil Degradation
Increase in the economic density of rural territories from new industrialization processes and local use of biomass for the generation of bioproducts and bio services.	SDG 8: New Sources of Decent Work and Sustainable of Economic Growth

The bioeconomy has also been identified as capable of contributing to reindustrialization and the renewal of rural areas. The convergence of scientific and technological advances in biology, science, and engineering, and the demands of sustainability are giving rise to innovative new production strategies and business models. These models offer concrete options for an increased convergence between energy generation, food and raw materials production, and the care of natural resources objectives. These further translate into increased investment, employment, and sustainable wealth creation opportunities.

The increased visibility of sustainability issues is of particular importance for the future of many low income countries (LICs) that continue to have a high dependence on agricultural-based sectors (Diakosavvasi and Frezali 2019; El-Chichakli et al. 2016; IICA, FAO, and ECALC 2019). Furthermore, as a large proportion of the world youth—particularly in the poorest segments of society—are expected to be in rural areas (OECD 2018b), a more diversified rural bioeconomy offers a concrete opportunity to create real value sustainably and inclusively.

Reflecting these new perspectives, at least 49 countries, including most OECD countries, have bioeconomy related strategies in place, and there are many concrete examples of private sector-led initiatives that are tangible examples of both the viability and potential of the new concepts.

## Proposal

There is general agreement that the bioeconomy holds the potential to provide global environmental benefits and promote the much-needed transformation at the national level, through new cycles of innovation and investments. Furthermore, there is growing evidence that many of its components could play a significant role in addressing the issues emerging from the present COVID-19 crisis. The current rapid responses that the biotechnology-based industry is offering in terms of the development of the diagnostics kits, and eventually of an effective vaccine, can be expected to strengthen support for bio-based strategies.

Biotechnology—as well as other technologies within the bioeconomy—will also become strategic instruments in the post-COVID transformation of food systems. This includes more efficient production and biomass valorization processes, bioenergy, and platforms for quality and health assurance throughout the food chain. The issue, however, is that most of the existing experiences are new and still developing. Furthermore, they have been developed from a different set of priorities than those most economies will confront in the years to come as the world comes out of the present pandemic. Therefore, the G20 is in a powerful position to contribute to the much-needed

come as the world comes out of the present pandemic. Therefore, the G20 is in a powerful position to contribute to the much needed convergence of perspectives among policymakers from different parts of the world. Consequently, the potential of bioeconomy solutions to present and future social and economic challenges can be fulfilled.

The G20, as the foremost fora for global, economic, and political cooperation, should focus on promoting a common understanding of bioeconomy objectives and strategies. It should deliver several concrete public goods on a global basis to facilitate the exchange of technology. It should also coordinate funding from both the public and private sectors. The G20 should formulate common methods for the development of credible and effective economic indicators to support public and private decision making, and general principles of good practice to support these processes. All stakeholders should participate in this process to ensure that the actions proposed by the G20 countries are translated into concrete action at the local level.

### **Proposal 1: Concerted efforts to share and disseminate information and experiences**

There must be a concerted effort to share and disseminate existing information and experiences related to the bioeconomy as the basis for a broader consensus on effective policies and investments. This will facilitate its development both at the national level and on a global scale. The G20 and the international development community, particularly development banks, can play a useful role in supporting this conversion to a more sustainable production system in LICs (which include most of the leading bio-based economies). They have more than a decade of experience in formulating and implementing policies and programs that promote and support the bioeconomy. Over this period, they have been able to develop concrete information on what works and what does not and can assure the safety and sustainability of the new approaches. In the coming years, we can expect significant resource constraints. These experiences could be highly valuable as a platform for more efficient and effective societal transformation processes, such as the consolidation of the bioeconomy, which demands consistent long-term policy perspectives.

Subsequently, it is proposed that the G20 support the process initiated around the Global Bioeconomy Summit <sup>[1]</sup> to bring together stakeholders worldwide to conform to a platform connecting informed opinion leaders and trusted sources in the diverse fields of bioeconomy policy and sustainable development. Such an initiative could provide a neutral place to promote consensus building on how different bioeconomy pathways can contribute to sustainable development. Simultaneously, it can inspire policy and innovation stakeholders globally to turn ideas and recommendations into reality and collaborate for successes in other countries and regions. The G20 support could become strategic in assuring its further institutionalization as the place to address bioeconomy development issues from a global perspective, while at the same time assuring due consideration of issues affecting smaller LICs. Critical issues to focus on at this level include (i) generating greater consensus among different stockholders (both public and private) on the potential of the bioeconomy, (ii) promoting better management capacities, (iii) promoting R+D support for bioeconomy related technological challenges, and (iv) promoting market development for bioeconomy products.

### **Proposal 2: Credible bioeconomy indicators for guiding decision making and investments and monitoring progress towards objectives.**

The bioeconomy is a dynamic and complex societal transformation process that demands a long-term policy perspective. This process implies major changes in development pathways as well as significant potential conflicts (i.e., eventual land-use conflicts between food and energy production). Existing economic indicator systems seldom reflect the nature of the new resource-production-consumption relations implicit in the bioeconomy vision (for example, the systems of national accounts that quantify the production, employment, and income of the countries, or the harmonized commodity description and coding systems—HS—used to classify and estimate foreign trade). As the bioeconomy is cross-cutting, many of the metrics commonly used to classify, collect, and report economic data fail to capture bioeconomic activity in its entirety. Furthermore, most of the bioeconomy products and processes often replace existing ones, so existing statistics do not fully reflect their benefits, costs, and risks. This makes evidence-based decision-making processes—both at the public and private level—difficult and erratic. There is a need to revise existing methods in line with the characteristics of the new bio-based activities. This is at least in reference to (i) the contributions of the bioeconomy to the country's economic and social objectives (e.g., growth, employment, food security, and exports), (ii) basic data on strategic components of the bio-based business (e.g., availability, investments, and capacities), (iii) nature and the magnitude of the linkages between bio-based and conventional sectors of the economy, (iv) environmental performance indicators of specific biobased activities and sectors, and (v) the eventual risks (e.g., environmental and health) associated with the emerging bio-based activities.

These needs are of general interest to the international community, and confronting the challenges would be best achieved through international multi-stakeholder cooperation. This would reduce the risks of duplications and enhance possible synergies. Given its political

reach, the G20 is the logical platform for promoting a joint effort within the development cooperation community, the development of harmonized conceptual and operational approaches for such a set of indicators.

### **Proposal 3: Synthesizing best practices for bioeconomy policymaking**

Strengthening G20 country strategies for developing a bioeconomy domestically is crucial. Several G20 countries already include the bioeconomy within their development strategies (Germany, USA, UK, Spain, Brazil, and Argentina, among others). Other members of the G20 should follow suit by reviewing their national plans to increase the relevance of the bioeconomy as a more effective global instrument in pursuance of the Sustainable Development Goals (SDGs). Following this, it would be desirable that the G20 calls on a consortium of international cooperation organizations to develop a succinct document of best practices for bioeconomy policymaking, similar to the G20 Guiding Principles for Investment Policymaking developed at the 2016 Hangzhou Summit.

Some of the G20 countries are global leaders in the bioeconomy, with large and valuable experiences already being reflected in their development strategies. Building on these assets, the G20 can raise consensus to facilitate the transition toward a more inclusive and sustainable development model by promoting the sharing of information and experiences to both create common perspectives and help decision making at the policy level. The G20 should also mobilize the innovations required for effective implementation of the new visions in terms of income and productivity improvements, ensuring food security, and addressing climate change. Specific aspects include (i) how to identify the bioeconomy potential for a given country or territory, and the main strategic intervention areas; and (ii) best practices for governance and policy development and implementation.

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#### **Disclaimer**

This policy brief was developed and written by the authors and has undergone a peer review process. The views and opinions expressed in this policy brief are those of the authors and do not necessarily reflect the official policy or position of the authors' organizations or the T20 Secretariat.

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## Appendix

[1] . <https://qbs2020.net>.

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## Existing Initiatives & Analysis