IBF Working Group on Biorefineries

Policy Brief – September 2026

Context

Several high carbon-emitting nations are actively transitioning towards a sustainable circular bioeconomy, supporting the United Nations (UN) Sustainable Development Goals (SDGs),[1] regional and country strategies and policies. In a context of climate change, increasing pressure on natural resources, and intensifying competition for biomass, global alignment on what constitutes a sustainable bioeconomy and its key components is of fundamental importance.

Amongst the production approaches explored in the scientific and industrial communities, integrated biorefineries are recognised as having the potential to create substantial socio-economic opportunities while contributing to reducing dependence on fossil fuels or non-renewable resources, lowering the overall environmental impacts and addressing numerous common societal grand challenges. As such, integrated biorefineries have the capacity to support the implementation of several G20 Initiative on Bioeconomy (GIB) High-Level Principles (HLPs), namely HLP 5, 7, 9 and 10, by promoting sustainable and circular use of biological resources; benefiting from policy frameworks that advance inclusive bioeconomy growth; fostering international collaboration to promote financing and capacity building; and supporting country- and regional-specific implementation approaches, respectively.

The concept of biorefinery has emerged as an important component in the bioeconomy framework due to the availability of a wide range of biomass resources that, provided they are sustainable and used responsibly, offer opportunities for a broad range of products to meet societal needs. Notably, they may provide fossil-free alternatives and help create new, stable income streams through supporting development of new skilled jobs and revitalisation of rural, coastal and (post-)industrial regional economies. Biorefineries are critical in the transformation of renewable biomass into bio-based products and materials, e.g. construction materials, plastics and textiles, fertilisers, plant protection products, bio-chemicals, bioenergy/biofuels, food and feed ingredients and other high-value products such as pharmaceuticals and cosmetics.[2] They are also recognised for their potential to modernise industries facing declining competitiveness due to high production costs and aging infrastructure.[3]

Using sustainable feedstock, biorefineries present opportunities for diversification of products from various sources of biomass, valorisation of waste material, penetrating new markets as a result of developing new bio-based products, as well as contributing to a greener environment.

Purpose and Scope

This policy paper aims to assess the research, development and innovation (RDI) challenges, as well as the policy developments and enabling platforms, that are critical to advancing integrated biorefineries within the broader bioeconomy/bio-based economy framework.

The Biorefineries' Working Group (WG) focuses on bio-based materials and chemicals as the main applications/market sectors (see examples listed above).[4] The WG recognises the role of

[1] In particular SDG 8, 9 and 12

[2] Philip C. 2017. The bioeconomy, challenges of the century for policy makers. New Biotechnology. 40: 11-19.

[3] Pachon ER *et al*. 2018. Transition of a South African sugar mill towards a biorefinery. A feasibility assessment. Applied Energy. 229: 1-17.

[4] aligned to the scope of Horizon Europe Cluster 6 ("Food, Bioeconomy, Natural Resources, Agriculture and Environment"), supporting, from the EU side, the activities of the International Bioeconomy Forum.

bioenergy/biofuels, as part of the overall bioeconomy, where biorefineries may offer important technological and economic opportunities, as part of the global green transition. However, it is noted that for this area, other dedicated international efforts exist, e.g. the Mission Innovation Biorefineries[5] (see INTEGRATED BIOREFINERIES MISSION - Mission Innovation). The Biorefineries WG will avoid overlaps and seek synergies with such parallel activities, in particular to support the sustainability of biomass, as well as advance resource efficiency (including the cascading use of biomass).

Within the IBF, the Biorefineries WG will address common challenges and opportunities for integrated biorefineries, including gaps in RDI, policy, financing and international cooperation. It will contribute to the implementation of the G20 HLPs by identifying enabling conditions, sharing best practices and supporting the development of approaches that can be adapted to different regional and country contexts.

Objectives

- Identify the role of RDI in driving new developments in integrated biorefineries;
- Map opportunities for new value chains and new circular bio-based industries;
- Assess opportunities for the localisation of technologies and international partnerships that can drive large-scale production of bio-based products using different feedstock;
- Evaluate regulatory frameworks and financing arrangements that have proven successful in establishing integrated biorefineries; and
- Assess opportunities and barriers for commercialisation and access to markets.

Key themes

- Transfer/knowledge sharing of biorefinery technologies, in particular on small scale rural industrial solutions, as well as on public-private cooperation modalities.
- International cooperation for leveraging resources and skills.
- Localisation/mapping and up-scaling of technologies, and their components, especially in view of replacing ageing infrastructures, and how they can be transformed into modern biorefineries, as well as their replication potential.

Expected outcomes

- Improve global policy development, based on shared knowledge on biorefining.
- Promote a just sustainable green transition for all, based on the potential of biorefining and industry, as part of the global bioeconomy (win-win solutions). Development of bio-based value chains globally and adapted to local conditions, leading to socio-economic benefits for all, simultaneously supporting an improved stakeholder engagement.
- Encourage uptake of biorefining-based products (market access dimension) through promoting business to business engagement opportunities (e.g., business networking, exchange of best practice).

Target audience

International policy makers involved in bioeconomy and bio-based economy governance, global circular bio-based industry, international organisations (e.g. OECD, FAO, Global Bioeconomy Summit), civil society actors, etc.

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[5] supported, from EU side under Horizon Europe Cluster 5 (“Climate, Energy and Mobility”)