Scaling the Bioeconomy through Sustainable Trade: Policy Recommendations from the G20 Global Bioeconomy Initiative (GIB)

Executive Summary

The global bioeconomy, valued at US\$4 trillion and projected to reach US\$30 trillion by 2050,¹ represents a potentially transformative solution to the interconnected global crises of climate change, biodiversity loss, food insecurity, and economic inequality. The bioeconomy, broadly defined as using renewable biological resources to generate sustainable products, services, employment, and income encompasses everything from regenerative agriculture, ecosystem services and blue carbon, to bio-based materials and fuels, to biopharmaceuticals and climate resilient agri-tech². Alongside the transition to renewable energy, the bioeconomy offers a vast opportunity landscape of innovation and commercial potential where biobased innovation can sustainably harness renewable resources while reducing human footprint and planetary impacts.

As G20 economies seek pathways toward resilient and inclusive growth for high impact sectors like construction, agriculture, energy, food and transportation, the bioeconomy represents simultaneously an opportunity and a core characteristic of the inevitable transition toward economic systems better aligned with planetary health requirements. Data from 2023 on biodiversity-based product trade highlights the significant potential for G20 members to increase economic growth and accelerate inclusive development through scaling sustainable bioeconomy markets.

Trade and investment policy can play a pivotal role in unlocking the full potential of a just and nature-positive bioeconomic transition. This transition entails moving decisively away from fossil-based systems toward higher-tech, circular, and bio-based value chains. Current global trade structures and investment flows fail to reflect and leverage this potential, but substantial progress can be achieved through strategic use of existing trade mechanisms alongside targeted reforms. For instance, Africa, despite its rich natural assets, captures less than 10% of the value generated from biomass, and could strengthen local value addition through basic bioprocessing of raw materials like timber, agricultural residues, decentralizing biomanufacturing for global firms and expanding regional trade clusters around biomass feedstock—all without changes to existing trade rules.

Realising bioeconomy potential requires coordinated action across national, regional, and international levels. The G20 is committed to working to reshape trade and investment frameworks to equitably scale a sustainable bioeconomy, harnessing its power to support both planetary health and shared prosperity. The following recommendations emerge from the second meeting of the South African G20 Global Bioeconomy Initiative (GIB) 2025 discussions on sustainable trade and the bioeconomy.

¹ Why we need standards and metrics for the global bioeconomy | World Economic Forum

² <u>Harnessing the Bioeconomy-Climate Nexus for Sustainable Development</u>

The Bioeconomy Initiative was proposed by Brazil's G20 Presidency to boost the development of this innovative and productive paradigm based on the combination of knowledge, technology and nature. During the Brazilian presidency, G20 members agreed on High Level Principles on the Bioeconomy³, which provide a comprehensive framework for advancing sustainable bioeconomy development globally. These recommendations are therefore designed to advance <u>High Level Principle 7</u>, which calls for policy frameworks that promote trade in bioeconomy products and services, ensure supportive market conditions, foster sustainable business models, create decent jobs, stimulate local value creation, and boost private-sector participation.

These recommendations recognise that meaningful bioeconomy advancement can be achieved through three complementary approaches: maximising opportunities within existing trade rules, leveraging established exceptions and evolving jurisprudence, and pursuing targeted reforms where necessary.

Building on this strategic framework, the recommendations are grouped along 7 key themes, that have provided the focal point for GIB discussions over the past two years of its existence:

- 1. Policy integration and harmonisation
- 2. Institutional coordination and governance
- 3. Trade infrastructure and market access
- 4. Financial incentives and subsidy reform
- 5. Regional cooperation and implementation mechanisms
- 6. Climate-resilient trade transformation
- 7. Data and Standards Harmonisation and Interoperability

GIB Recommendations on Scaling the Bioeconomy through Sustainable Trade

1. Policy Integration and Harmonisation

- Maximising existing trade framework opportunities G20 nations should prioritise integrated policy approaches that align national bioeconomy strategies with circular economy policies, just transition frameworks, and existing climate and biodiversity commitments such as Nationally Determined Contributions (NDCs) and National Biodiversity Strategies and Action Plans (NBSAPs). This alignment is essential to advancing G20 Bioeconomy High-Level Principle 7. Recent research demonstrates actionable pathways for policymakers, including the need to align and integrate national circular economy and bioeconomy policies, with practical recommendations to help scale circular bioeconomy models, particularly in the Global South⁴.
- Establishing clear regulatory distinctions between bio-based and fossil fuel-based products, which will enable clearer measurements, regulations and incentives for bio-based products. Such distinctions will also better enable trade classifications and standards which prioritise bio-based products that can demonstrate verifiable lifecycle benefits such as reduced carbon emissions,

³ G20 reaches consensus and establishes High-Level principles on Bioeconomy

⁴ https://unctad.org/system/files/non-official-document/smep-circular-bioeconomy-brief-19-june-2025.pdf

- biodegradability, and sustainably sourced inputs. Emerging models, such as the <u>UK's Regulatory Innovation Office</u> (RIO), offer promising examples of how national efforts and existing trade rules can address regulatory bottlenecks and support innovation in bio-based sectors.
- To scale these efforts globally, G20 countries should work toward the creation
 of a Bioeconomy Mutual Recognition Framework. This framework would be
 a shared system for recognizing sustainability certifications and establishing
 common criteria for legitimate, sustainability produced bio-based products.
 Together with efforts to harmonise sustainability standards across G20
 members, such increased interoperability would reduce trade friction and
 regulatory fragmentation, increase market predictability, and unlock new
 opportunities for investment, economic growth, and job creation in the
 bioeconomy.
- G20 countries should **leverage existing multilateral trade mechanisms and established frameworks**, such as the Agreements of the WTO, which directly enable and shape biodiversity-related measures⁵ to create enabling policy environments for sustainable bio-based goods and services. Additionally, the G20 can leverage **bilateral and regional free trade agreements** as vehicles for promoting bioeconomy development. For example, the <u>EU–Kenya Economic Partnership Agreement (EPA)</u>, the most ambitious EU trade deal with a developing country to date, provides duty-free access to products derived from the sustainable use of natural resources, including botanicals, plant extracts, and agro-products, aligning closely with bioeconomy and sustainability objectives. These agreements offer greater flexibility than multilateral frameworks and can establish precedents for interpreting existing WTO rules in bioeconomy-friendly ways.
- G20 countries should undertake national (or regional) assessments across two interconnected domains to identify priority areas for policy intervention and investment:
 - 1. Trade policy frameworks that support sustainable bio-based products and services, including sustainable agricultural exports, sustainable trade initiatives, especially those highlighting the use of maritime and aviation biofuels and natural non-plastic substitutes such as natural fibres and marine-based materials like seaweed. They also include innovative biotechnology products, carbon-trapping biochar, and alternative proteins.
 - 2. Bioeconomy resource endowments and expertise, low carbon biobased industries and innovation capabilities.
- G20 countries should consider more strategic investment in robust monitoring, reporting, and verification (MRV) systems for bioeconomy goods and services, which reduce operational costs for bioeconomy enterprises while improving market confidence through transparent sustainability metrics. These systems should be designed to minimise compliance burdens on enterprises, particularly small, micro and medium-sized businesses, while providing credible assurance about sustainability claims. Harmonised international standards and mutual recognition agreements can reduce duplicated reporting requirements and facilitate cross-border trade in certified

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⁵ SPS Agreement, TBT Agreement, Agreement on Agriculture, SCM Agreement, TRIPS Agreement. Also, the Agreement on Fishery Subsidies is set to enter into force imminently.

bio-based products. Developing countries will require enhanced technical and financial support to build these capacities.

Undertake regulatory reforms to update and harmonise standards governing the cross-border movement of high-value bio-based goods and services including waste-derived products, botanicals, biofertilizers, bio packaging, and bioenergy. This should include aligning sustainability certification schemes, customs classifications, and phytosanitary rules to reduce trade frictions, enable technology diffusion, and support the development of regional value chains in the bioeconomy. These reforms should promote locally anchored best practices, build institutional capacity, and encourage simple, interoperable frameworks that facilitate trade and technology cooperation while minimising transaction costs.

2. Cross-Ministerial and Coordination Alignment for Implementation

- Scaling the bioeconomy requires strong coordination across government ministries especially those of finance, environment, trade, economic planning, agriculture, and energy. G20 countries must align financial policies, investment plans, and trade regulations to create a clear and consistent policy environment that supports sustainable bio-based growth. This coordination should include mechanisms to manage trade-offs and create complementarities between commercial and environmental goals, ensuring that economic interests support rather than undermine sustainability. Transitional policies are also needed to support the shift away from fossil fuel-based products and toward more circular and sustainable nature-based solutions.
- As a first step, G20 members should establish a G20 Inter-Ministerial Working Group on the Bioeconomy to replace the current G20 Global Bioeconomy Initiative. This group would guide policy alignment across countries and develop shared approaches to bioeconomy development, including transitional policy design, investment-ready hubs, and region-specific innovation zones, similar to recent EU efforts. This working group can operate within existing G20 structures while providing the coordination necessary to ensure national bioeconomy strategies contribute meaningfully to trade, climate, and economic goals. Without such coordination, national bioeconomy strategies risk remaining fragmented and may fall short of contributing meaningfully to trade, climate, and economic goals. Key to its success will be ensuring that ministers of finance are engaged alongside other relevant line ministries (e.g. energy, science and technology, agriculture, environment) to engage the bioeconomy as a crosscutting economic growth and development approach, rather than a siloed sector.

3. Trade Infrastructure and Market Access

• As part of a larger commitment to decarbonising the global economy and supporting more sustainable economic development the G20 should consider establishing a Bioeconomy Trade Alliance. This alliance would be a coalition of willing countries that can move faster than traditional multilateral processes to create preferential trading arrangements for bio-based products, building on successful precedents in regional trade innovation. The G20 and OECD Inclusive Framework on Base Erosion and Profit Shifting (BEPS) provides a relevant precedent for this kind of alliance.

- The establishment of bioeconomy trade facilitation hubs at major ports and border crosses will be necessary infrastructure to rapidly grow the bioeconomy at scale. These hubs—near-term capital-intensive investment that can deliver long term global rewards—must ultimately include specialised customs facilities and testing laboratories for bio-based products.
- Such "hard" infrastructure should be paired with the rapid development of digital trade platforms that connect domestic bioeconomy producers with global buyers and demand, while providing robust verification systems for sustainability claims.
- National standard setting agencies and accreditation bodies must also be enlisted at scale to support product quality assurance, biosafety, and cross-border compliance, alongside investments in training customs and trade officials on bioeconomy product classifications and sustainability standards. This includes considering establishing bioeconomy trade facilitation desks within export promotion agencies. Multi-lateral development banks, export credit agencies, national and regional development banks and relevant UN agencies all have a key role to play in driving these efforts around bioeconomy trade facilitation. In particular, Medium, Small and Micro-Enterprise (MSMEs) and cooperatives will require support meeting international certification and traceability requirements.

4. Financial Incentives and Subsidy Reform

- Unlocking trade opportunities in the sustainable bioeconomy can be achieved by leveraging strategic incentives and financial tools such as public procurement policies, industrial strategies, tax incentives, and export credit instruments to support higher-value, circular, and nature-positive biobased products and services. Public procurement represents a particularly powerful driver of bioeconomy development, enabling governments to prioritise economically viable bio-based alternatives to fossil fuels and synthetic agricultural products while creating stable demand signals for emerging industries. Successful examples demonstrate the potential of coordinated procurement strategies, such as:
 - The proposed multistakeholder initiative in East Africa supported by the Global Alliance for the Future of Food, aims to utilise public procurement through school feeding to generate demand for locally produced, organic food stuffs.
 - Ongoing discussions in <u>Indonesia exploring Green Public Procurement</u> to support domestic sustainable agriculture sectors.
 - The <u>US' BioPreferred</u> Program exemplifies systemic implementation, introducing mandatory public purchasing requirements for national agencies and their contactors of bio-based as opposed to fossil-fuel based products, as well as encouraging biobased labelling.
- G20 members are encouraged to review and repurpose existing subsidies
 to promote trade in sustainable bioeconomy sectors, while phasing out
 incentives that reinforce fossil-based or nature-degrading value chains.
 This includes the critical need to repurpose harmful agricultural subsidies that
 currently incentivize unsustainable practices and limit the development of
 nature-positive farming systems essential to bioeconomy growth. The

substantial disparity between fossil fuel subsidies (\$620 billion in emerging and developing economies spent in 2023) and consumer-facing clean energy investments (\$70 billion)⁶ highlights the substantial opportunity for subsidy reform to accelerate bioeconomy development while reducing fiscal inefficiencies. Effective subsidy reform should emphasize positive incentives that encourage bioeconomy adoption while ensuring support mechanisms promote genuine sustainability outcomes rather than bio-based alternatives that could prove environmentally detrimental. As examples like Germany's Feed-In Tariff and the U.S. Inflation Reduction Act demonstrate, countries can begin creating incentives for sustainable development even in the continued presence of harmful subsidies.

5. Regional Cooperation and Implementation Mechanisms

- In line with High-Level Principle 9 and given the urgency of climate action and the competitiveness of emerging bioeconomy sectors, G20 members should establish formal regional coordination platforms that support joint action while ensuring fair and inclusive distribution of benefits. These mechanisms can help countries pool resources, share knowledge, and develop coordinated markets that create scale, attract investment, and expand market access in ways that individual countries cannot achieve alone.
- Likewise, they should facilitate technology transfer, harmonise sustainability standards and certification systems, and support joint financing facilities for cross-border projects. A dual-track implementation model is essential for combining bottom-up, community-led initiatives with top-down policy and investment frameworks. Regional approaches should also prioritise incentives that remove trade barriers, unlock new markets, and ensure that local value creation, decent work, and equity are embedded in bioeconomy development strategies.
- Recent examples demonstrate the potential of such approaches. Initiatives like the African Circular Economy Alliance (ACEA) and the Africa Circular Economy Facility (ACEF), supported by the African Development Bank, have emerged as key platforms for integrating circular economy principles into regional trade agreements, such as the African Continental Free Trade Area (AfCFTA). Similarly, the Asia-Pacific Economic Cooperation's (APEC) adoption of the Bangkok Goals on the Bio-Circular-Green (BCG) economy underscores regional commitments toward harmonized circular economy standards and sustainable trade policies. In Europe, the EU Biobased Industries Consortium (BIC) and Circular Bio-based Europe (CBE JU) represent successful public-private partnerships funding large-scale biorefinery projects and technology platforms. Meanwhile, the Community of Latin American and Caribbean States (CELAC) bioeconomy working group is advancing regional coordination on bioeconomy development strategies.

6. Climate-Resilient Trade Transformation

 The bioeconomy presents unprecedented opportunities to make trade more sustainable if properly leveraged, particularly in sectors where few sustainable alternatives currently exist. Transport and construction alone

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⁶ Fossil Fuel Subsidies - Topics - IEA

account for over 36% of total CO₂ emissions in the European Economic Area (EEA-32) region, making them strategic entry points for climate-smart trade reform⁷. Bio-based alternatives in these areas can build on existing environmental exceptions in trade rules while establishing new precedents for climate-friendly trade policies. This presents an opportunity to leverage trade mechanisms to build climate-resilient development pathways that connect bioeconomy advancement with broader just transition and climate adaptation strategies.

- To operationalize this, the G20 should strengthen existing platforms and initiatives particularly the G20 Trade and Investment Working Group (TIWG), the G20 Sustainable Finance Working Group (SFWG), and UNCTAD's BioTrade Initiative and the <u>Sustainable Manufacturing and Environmental Pollution (SMEP) Programme</u> to facilitate bioeconomy cooperation through enhanced information sharing, coordinated research and development investments, and aligned policy approaches that maximize each country's comparative advantages while ensuring equitable benefit distribution across regions.
- Additionally, G20 countries should integrate bioeconomy strategies as central components of their National Adaptation Plans (NAPs) under the UNFCCC framework, ensuring that climate adaptation efforts leverage bio-based solutions for building resilience across sectors, particularly in agriculture, forestry, and coastal management.

7. Data and Standards Harmonisation and Interoperability

- Without standardised data frameworks and mutual recognition agreements, G20 members cannot effectively leverage trade mechanisms to scale bioeconomy solutions or create the transparent market conditions necessary to attract private sector investment at the scale required for meaningful impact. The absence of harmonised data collection methods and standardised metrics across G20 nations is a critical barrier to expanding bioeconomy trade. Inconsistent definitions, measurement protocols, and certification systems fragment markets, undermines investor confidence and limits cross-border commerce. These disparities, especially around how countries classify biobased products, measure sustainability impacts, and verify carbon removal claims lead to high transaction costs and regulatory uncertainty, impeding the development of integrated global bioeconomy value chains.
- To address this, the G20 should establish comprehensive data and standards harmonisation frameworks that create interoperable systems for measuring, reporting, and verifying bioeconomy activities across member countries. This should build upon the Bioeconomy Mutual Recognition Framework referenced in policy integration efforts, creating shared systems for recognizing sustainability certifications and establishing common criteria for authentic bio-based products. The framework should mandate datasharing protocols that support real-time monitoring of bioeconomy trade flows, sustainability outcomes, and market development trends. This transparency is essential for evidence-based policymaking and building investor confidence. Furthermore, harmonised standards must cover the full spectrum of

⁷ https://www.eea.europa.eu/en/analysis/publications/bioeconomy-unlocking-opportunities-for-innovation-in-the-bioeconomy

- bioeconomy activities i.e. from feedstock production and processing to product certification and end-of-life management, ensuring that trade facilitation aligns with environmental objectives.
- As a first step, members should establish a G20 Bioeconomy Data Consortium that creates standardised definitions, measurement protocols, and reporting frameworks for bio-based products across all member countries. The consortium must include technical working groups with representatives from trade, environment, and standards agencies from each member country, operating through existing G20 institutional mechanisms while providing specialised bioeconomy expertise. Relevant precedents include the G20 Global Infrastructure hub, which centralizes data on global infrastructure investment needs, project pipelines and best practices, and the G20's Data Gaps Initiative, which has fostered the creation of monitoring frameworks and platforms to track gaps in financial data, systemic risks, and shadow banking.

Overview of Pain Points and Potential Implementation Pathways

Intervention	Challenges	Proposed Solutions	Potential Implementation Partners
Area		_	and Frameworks
Policy Integration and Harmonization	 Divergent sustainability standards and bio-based product classifications across G20 create trade barriers and unpredictable market conditions for bioeconomy enterprises. 	Establish a G20 Bioeconomy Mutual Recognition Framework with shared safety standards, clear bio-vs-fossil distinctions, and expedited approval pathways.	 G20 inter-ministerial WG (trade, environment, finance, agriculture, planning) G20 Sustainable Finance WG G20 Trade and Investment WG
Institutional Coordination and Governance	 Lack of coordination across government ministries (e.g. finance, environment, trade, economic planning, agriculture, energy) Fragmented policy approaches undermining bioeconomy development 	Establish a G20 bioeconomy interministerial working group to co-ordinate policies across members, share experience and develop pathways for bioeconomy development.	G20 inter-ministerial WG (trade, environment, finance, agriculture, planning)
Trade Infrastructure and Market Access	 Fragmented or underutilised trade arrangements Limited infrastructure at ports and borders for biobased products Limited connection between domestic producers and global buyers with sustainability verification Insufficient knowledge of bioeconomy products among trade officials 	 Establish a G20 Bioeconomy Trade Alliance, a coalition of willing countries for preferential trading arrangements in biobased trade. Invest in government-funded programmes or inter-country exchange programmes for bioeconomy education, reskilling and R&D Leverage the G20 Global Infrastructure and Investment (GII) framework to prioritise bioeconomy infrastructure projects that create regional value chains and trade corridors. 	 G20 inter-ministerial WG (trade, environment, finance, agriculture, planning) G20 Sustainable Finance WG G20 Trade and Investment WG UN Trade & Development (BioTrade Programme and Sustainable Manufacturing and Environmental Pollution (SMEP) Programme) AfCFTA EU BIOBec Project – EU Horizon 2020 G20 GII
Financial Incentives and Subsidy Reform	 Lack of coordinated government purchasing power for bio-based products. 	Align public procurement policies, tax incentives and industrial policy to prioritise economically viable bio-based alternatives, creating stable demand signals.	 G20 Energy Transitions WG IMF Fossil Fuel Subsidy Reform initiatives OECD subsidy tracking mechanisms G20 Public Procurement WG

	Misslianed tox systems do not	Deview and repurpose evicting subsidies to	
	 Misaligned tax systems do not support bio-based product 	 Review and repurpose existing subsidies to promote sustainable bioeconomy sectors 	
	development	while phasing out fossil-based incentives.	
Regional Cooperation and Implementation Mechanisms	 Lack of structured regional cooperation for bioeconomy development. Limited knowledge sharing and technology transfer between countries 	 Establish formal regional coordination platforms for joint action with fair benefit distribution. Facilitate technology transfer and harmonise sustainability standards/certification systems. Support joint financing facilities for cross-border bioeconomy projects drawing on successful models such as the Green Climate Fund's Amazon Bioeconomy Fund⁸ and the EU's Connecting Europe Facility (CEF)⁹. 	 G20 inter-ministerial WG (trade, environment, finance, agriculture, planning) G20 Digital Economy Task Force G20 Sustainable Finance WG G20 Trade and Investment WG UN Trade & Development G20 Infrastructure WG Multilateral Development Banks coordination Green Climate Fund
Climate-Resilient Trade Transformation	 Fragmented existing initiatives limiting bioeconomy cooperation. Disconnected bioeconomy and climate adaptation strategies. 	 Strengthen G20 TIWG, SFWG, and UNCTAD's BioTrade Initiative for enhanced information sharing and coordinated R&D investments Incorporate bioeconomy approaches in national adaptation plans 	 G20 inter-ministerial WG (trade, environment, finance, agriculture, planning) G20 Sustainable Finance WG G20 Trade and Investment WG UN Trade & Development
Data and Standards Harmonisation	 The absence of harmonised data collection methods and standardised metrics across G20 nations is a critical barrier to expanding bioeconomy trade. Inconsistent definitions, measurement protocols, and certification systems fragmenting markets. 	Establish a G20 Bioeconomy Data Consortium that creates standardised definitions, measurement protocols, and reporting frameworks for bio-based products across all member countries.	 OECD trade and environment initiatives AfCFTA The Africa-EU trade partnership G20 inter-ministerial WG (trade, environment, finance, agriculture, planning) G20 Trade and Investment WG UN Trade & Development

⁸ The Amazon Bioeconomy Fund encourages private investment in sustainable agroforestry, native palm cultivation, non-timber natural forest products, and community-led nature tourism.

⁹ The CEF promotes growth through collaborative investment in renewables at European level.