POLICY BRIEF

Embedding Circularity in Global Trade: A G20 Road Map for Catalysing Circular Value Chains

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Venkatachalam Anbumozhi, Economic Research Institute for ASEAN and East Asia, Jakarta (Indonesia)
Hidetoshi Nishimura, Musashino University, Tokyo (Japan)
Pamla Gopaul, NEPAD, Johannesburg (South Africa)
Ana Celia Castro, Federal University of Rio de Janeiro (Brazil)
Sweta Prabakar, Centre for Environment, New Delhi (India)

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Trade and Investment

Abstract

The circular economy transition along global value chains provides levers that can curb raw material use, preserve biodiversity, and reduce pollution, including the emission of greenhouse gases. While the transition to circularity is building momentum, several systematic barriers continue to exist from the view of accelerated trade and investment in emerging economies. This policy brief presents six proposals that facilitate the transition to circular value chains in G20 countries and the Global South. In detail, we recommend: (1) advancing the circular design of products, (2) making international trade and investment policies supportive of circular value chains, (3) enhancing funding for circular economy investments and establishing dedicated financing mechanisms for that purpose, (4) developing environmental, social, governance and circularity metrics that drive investment decisions towards sustainability, (5) facilitating a localised transition by harnessing regional resources to shorten value chains, allowing path diversity to long-term optimisation, and (6) developing an open digital platform to ensure that the diversified transition process is just and inclusive for the Global South by supporting reverse logistics and globally applied EPR standards.

Keywords: Circular Economy, Digitalisation, Global South, Extended Producer Responsibility, Manufacturing Industries, Sustainable Finance, Transcontinental Value Chains

Diagnosis

Driven by the growth in population and GDP, global resource extraction and consumption are projected to double by 2060. However, less than 10% of the raw materials extracted and used for manufacturing are put back into circulation.[1] This low level of resource circularity puts pressure on ecosystems, intensifies pollution and waste challenges, and accelerates climate change. Advancing urbanisation, industrialisation, and electromobility will likely further increase raw material extraction and exacerbate environmental pressures. According to the World Bank,[2] solid waste generation could increase by 70% by 2050, unless governments in the advanced Global North and developing Global South take drastic action.

Embedding circularity in trade and investment aligns with G20 priorities for resilient supply chains, sustainable development, and digital transformation. The last three G20 presidencies from the Global South – Indonesia (2022), India (2023), and Brazil (2024) – stressed the need for integrating environmental sustainability into global value chains. This brief focuses on the circular transition of industrial flows, integrating digitalisation, resource localisation, and economic security frameworks.

Modern resource extraction industries and global industrial manufacturing units remain mostly organised along linear value chains, with production taking place in a variety of regions and countries, decided based on the comparative monetary advantages of each location. Taking into account the particularities of each sector, opportunities for circular growth rely on new automation, digital and

[1] Circle Economy (2022). The Circularity Gap Report 2022. https://www.circularity-gap.world/2022#Download-the-report
[2] World Bank (2020). Global Waste Trends.

green technologies, and innovative business models supported by enhanced public–private–people partnerships.

A new global circular economy vision is needed to ensure that these value chains become more resilient and sustainable, and to demonstrate how resource-business models can support a just transition that would benefit the Global North and the Global South equally. The new value chain concept will promote economic development through enhanced intra-regional and transcontinental connectivity.

Furthermore, since the creation of a circular economy ecosystem represents an important change in the traditional evolutionary path of modern civilisation, the implementation of this agenda will promote inclusiveness at all levels of society, including local communities and small businesses. Strategic interventions are needed to boost local economic development via enhanced intra-regional and transcontinental connectivity.

Here we propose the development of a total supply chain, including the linkage of upstream–downstream issues. Traditional supply chain development mainly considers the production issue; however, it has missed the issue of inclusive growth, such as the formalisation of the informal sector. The next generation of industrial development should consider the integrative approach of production and circularity.

Recommendations

Establish circular material transition targets and key performance indicators (KPIs) that drive the circular design of products and associated services

Focusing on plastic waste spurred innovation globally. However, clarity on other materials, especially in trade flows,[3] is lacking. Emphasis should be on easily processed mass-consumption materials. Material disclosure mechanisms are crucial for transparency in hazardous chemical use. While EU regulations like Evaluation, Authorisation and Restriction of Chemicals (REACH) and Classification, Labelling and Packaging Regulation (CLP) advance disclosure, implementation costs for safer substitutes risk setbacks, especially for small and medium-sized enterprises (SMEs).[4] Lack of enforcement and reliable information-sharing risks a chemical safety divide.

Eco-labelling for material efficiency should link to material passport databases to identify mixes and track reuse. Despite high material circularity in emerging industrial countries, there's no mechanism to valorise their GDP contribution. Global collaboration on material efficiency and circular trade flows cannot be limited to high-level policy discourse. Instead, G20 countries need to adopt a comprehensive approach, including the development of KPIs, to influence behaviour on every level, from producer to consumer.[5]

Redesigning global companies' production-consumption based on integrated arterial and venous industries is vital. Global collaboration on material efficiency cannot be limited to high-level discourse. G20 countries need a comprehensive approach, including KPIs, to influence behaviour. Interventions should align with digital divide-reduction investments and research infrastructure improvements.

[3] Zhang, J. & Boliño, S. (2019). Coherent Global Trade Policy Frameworks Needed for Circular Economy for Plastics. *IISD*. https://sdg.iisd.org/commentary/policy-briefs/coherent-global-trade-policy-frameworks-needed-for-circular-economy-for-plastics/

[4] Vinceti, S.R., Docea, A.O., Tsitsimpikou, C. & Filippini, T. (2021). Updating the European Union's regulation on classification, labelling and packaging of substances and mixtures (CLP): A key opportunity for consumers, workers and stakeholders with interests in the legislation and toxicology of hazardous chemicals. Toxicology Reports, 8, p. 1865-1868. https://doi.org/10.1016/j.toxrep.2021.11.011

[5] Anbumozhi, V., Ramanthan, K.& Wyes, H. (2020). Assessing the Readiness for Industry 4.0 and Circular Economy, Economic Research Institute for ASEAN and East Asia https://www.eria.org/publications/assessing-the-readiness-of-industry-40-and-the-circular-economy/

Linking economic valuations to efficient material flows can yield significant trade benefits with targeted transition strategies.

Identify actions and foster collaboration to make trade and investment policy supportive of circular supply chains

Trade is crucial for efficient circular supply chains, promoting access to goods, services, and technologies, and creating economic opportunities. Governments must collaborate to prevent illegal or under-regulated trade in waste. Challenges include distinguishing reusable materials from waste, diverse national regulations, and trade-distorting measures.

A reliable, transparent policy environment is needed to encourage long-term circular supply chain investments from global firms and Global South suppliers. World Trade Organization (WTO) members increasingly focus on circular supply chains, discussing waste/chemical management, extended producer responsibility (EPR), recycling, and e-waste support for developing countries. Circular economy issues are priorities in WTO initiatives like Trade and Environmental Sustainability Structured Discussions (TESSD) and the Informal Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade (IDP). Developing the circular economy industry can attract investment to Global South suppliers and integrate them with arterial industries as "quality recycled materials" providers.

The G20 should lead the WTO in enhancing transparency through policy dialogues on trade and circular supply chains. This includes identifying actions and fostering collaboration. WTO deliverables could include circular economy considerations in environmental goods and services negotiations. Full digital technology use is also crucial. The G20 should use the WTO's Committee on Trade and Environment, TESSD, and IDP to share experiences and find solutions to enhance trade and investment policy supportiveness.

Enhance circular economy financing and establish dedicated funding mechanisms

Circular finance lacks harmonised frameworks, taxonomies, and metrics. While financial institutions slowly advance solutions, with some setting multi-billion-dollar targets, circular economy funding remains low compared to the linear economy.[6] Current investment is insufficient for large-scale transition. COVID-19 recovery packages offer a chance to promote a low-carbon circular economy, although they primarily supported resource-intensive systems previously.[7]

To mainstream circular finance in advanced economies, the "just transition" must be internalised in investments.[8] This tracks impacts on winners and losers, ensuring equal access to opportunities from global circular value chains. Beyond traditional development finance, we propose including all societal stakeholders.

The G20 should consider blended finance, combining public, private, and philanthropic capital for challenging infrastructure and riskier innovations.[9] Policymakers should offer economic incentives and fiscal interventions: taxes on virgin plastics and raw material extraction; value-added tax reductions for reuse/repair, shifting tax burdens; and changes in depreciation for circular products.[10] Circular economy finance can be de-risked by making it "opt out" through policies and standards, nudging banks towards sustainable investments. G20 countries should collaborate to establish a new development finance

[6] UNEP FI (2021). Accelerator Session: Financing the Circular Economy Transition. https://www.unepfi.org/wordpress/wp-content/uploads/2021/08/WCEF-Financing-the-Circular-Economy_Report_EN.pdf
[7] Anbumozhi, V. Kalirajan, X Yao (2022). Rethinking Low-Carbon Green Growth in Asia: Towards a Net Zero Circular Economy, Economic Research Institute for ASEAN and East Asia. https://www.eria.org/publications/rethinking-asias-low-carbon-growth-in-the-post-covid-world-towards-a-net-zero-economy/
[8] Schröder, P. & Raes, R. (2021). Financing an inclusive circular economy: De-risking investments for circular business models and the SDGs. https://www.chathamhouse.org/sites/default/files/2021-07/2021-07-16-inclusive-circular-economy-schroder-raes.pdf
[9] ERIA (2015). The Comprehensive Asian Development Plan 2.0 (CADP 2.0): Infrastructure for Connectivity and Innovation. Jakarta: ERIA. The Comprehensive Asian Development Plan 2.0 (CADP 2.0): Infrastructure for Connectivity and Innovation
[10] ERIA (2022). The Comprehensive Asia Development Plan (CADP) 3.0: Towards an Integrated, Innovative, Inclusive, and Sustainable Economy. Jakarta: ERIA. https://www.eria.org/publications/the-comprehensive-asia-development-plan-cadp-30-towards-an-integrated-innovative-inclusive-and-sustainable-economy/

ecosystem using blockchain technology with security token-offering systems to facilitate stakeholder entry.[11]

Develop ESG metrics that evaluate company performance on circularity principles, which are used by financing institutions to deploy capital per their institutional mandates

Sustainable finance investors increasingly use environmental, social, and governance (ESG) rating providers (ERPs) to assess companies' commitment to climate change mitigation using circularity principles. ERPs evaluate investment opportunities and risks, linking them to finance access and cost. With 85% of institutional investors committed to ESG,[12] G20 countries must develop a consensus-led multilateral framework for ESG ratings. Methodologies that determine rating scores vary among ERPs and can be ambiguous or inconsistently applied. Taxonomy defines circular mechanisms and includes products, components, and lifecycle stages. ERP taxonomy also varies widely across sectors, policies, and geographies.

ESG ratings often use broad metrics that do not automatically imply integrated circularity in global supply chains. Large companies operate across multiple geographies, with products part of various interconnected value chains. Companies often claim high ESG ratings based on final assembly, even if components are externally manufactured in low-rated value chains. Companies need unified multinational ESG ratings, fairly accounting for end-to-end product lines. ESG rating developers and auditors are often ill-equipped for detailed checks, leading to inaccuracies or manipulation.

[11] MIGA (2024), *MIGA policy package "Path Diversity" for "No One Left Behing"*, Musashino Institute for Global Affairs (MIGA) – Global South Research Caucus, 2024, https://www.globalsouth.musashino-u.jp/en/miga-pp-2024-nov/
[12] KPMG (2020). Sustainable Investing: Fast-forwarding Its Evolution.

Governments are addressing this: India's market regulator proposed ERPs have specialists in data analytics, sustainability, finance, infotech, and law.[13] The Association of Southeast Asian Nations (ASEAN) developed a sustainable finance taxonomy.[14] The developed countries primarily defining ESG ratings risk their dominance in developing countries' sustainable finance options. ESG rating inequities also hinder multinational circular value chain harmonisation. G20 countries must invest in building an equitable ESG rating system with unified scoring methodologies and taxonomies, considering each member's unique context. They also need to build globally accepted auditing and reporting mechanisms and work towards a common taxonomy for circular investments. This multilateral ESG rating system should include circularity principles to minimise climate impact and maximise resource efficiency.

Nurture a localised circular economy transition, harnessing regional resources to shorten value chains, reduce emissions, bolster local economies, and create long-term value, maximising the long-term value creation by allowing path diversity towards the transition and the value creation across local communities

A localised, decentralised circular economy transition encourages regions, SMEs, and social entrepreneurs to utilise local resources. This shortens value chains, reduces emissions, boosts local economies, and increases long-term sustainability. A decentralised approach, including renewable energy, helps local areas increase self-reliance. Due to diverse local resources, this transition allows for path diversity.[15] The COVID-19 crisis highlighted the need for resilient production-consumption systems fostering sustainability and circularity, involving local

[13] Securities and Exchange Board of India. (2022). Consultation Paper on Environmental, Social and Governance (ESG) Rating Providers for Securities Markets. New Delhi: SEBI.
[14] ATB (2022). ASEAN taxonomy for Sustainable Finance, ASEAN Taxonomy Board, https://www.sfinstitute.asia/wp-content/uploads/2021/11/ASEAN-Taxonomy.pdf
[15] MIGA (2024) *MIGA policy package "Path Diversity" for "No One Left Behing"*, Musashino Institute for Global Affairs (MIGA) – Global South Research Caucus, 2024, https://www.globalsouth.musashino-u.jp/en/miga-pp-2024-nov/

infrastructure and actors. The combination of crises and opportunities from the pandemic, decarbonisation, and circular economy underscored the importance of equity, safety, welfare, health, education, and public services at the local level. While recent international agreements set ambitious sustainability goals, the societal outcome is unclear. The challenge is balancing local circular economy transition with embedded circularity in supply chains.[16]

Supply chain risk assessment typically focuses on normative guidelines, with limited exploration into resilience and circular economy linkages. A regional circular economy transition offers regions a chance to demonstrate creativity in development strategies. While regional creativity emerged previously, it did not form a national movement. Japan's "Regional Circulating and Ecological Sphere" is a decentralised system to optimise carbon/material circulation and efficiently reduce waste.[17]

The G20 should build local governments' capacity as facilitators, forming decentralised loops for materials, finance, and people. Investing in social entrepreneurship and promoting public/private investment for adapted model cases can enhance the transition. To close circularity gaps, global value chains should introduce sustainability criteria, standards, and KPIs, especially where sustainability is scarce.[18] By linking digital opportunities to localised value chains, G20 countries can encourage socio-technical innovation, fostering new business models and lifestyles.

Develop an open digital platform to ensure national, regional, and trans-continental digital connectivity along circular value chains that makes the transition to a circular economy just,

[16] Anbumozhi, Kimura and Thangavelu 2020). Supply Chain Resilience
Reducing Vulnerability to Economic Shocks, Financial Crises, and Natural Disasters,
https://link.springer.com/book/10.1007/978-981-15-2870-5
[17] Shumpei Kumon, Mitsuhiro Maeda "Applied Infosocionomics– A Manifesto of Informatized Society Building in Developing Economies", ERISE Press, 2021
[18] Lavtižar V. (2021). "Circular economy in a global market perspective". Global Solutions. The World policy forum. Intersecting 7

inclusive, and entirely optimal for the Global South with the support of global EPR standards and other economic incentive mechanisms

G20 countries should support less developed nations in infrastructure development, education, and skill development to strengthen domestic and international connectivity, building a foundation for productive (arterial) industries.[19] Building special epistemic zones, a new type of wisdom agglomeration, might be a tangible milestone to meet the above requirements. Concurrently, they can foster circular (venous) industries by encouraging producers to design disassembled products. The G20, collaborating with the Global South, can establish circular economy principles-based criteria for a just transition, engaging all relevant actors to close the loop by connecting arterial industries, venous industries, and reverse logistics processes.

A circular economy will be achieved by improving efficiency across arterial and venous industries, using tools like Kaizen, lean production, robotics, information and communications technology, and AI. For the Global South to realise its full potential, an open digital platform is crucial for supporting dynamic optimisation of circular value chains based on economic changes. Integrating circular product design, financial incentives, and circular logistics into a digital platform allows circular value chains to create new added value and become sustainable. Digitalisation is essential for managing path diversity. This will promote circular economy industries and initiate leapfrog industrial development in Global South countries through "high-quality recycled materials" production. A leapfrogging of industrial development in developing countries will thus be initiated.

[19] ERIA (2022) The Comprehensive Asia Development Plan (CADP) 3.0: Towards an Integrated, Innovative, Inclusive, and Sustainable Economy. Jakarta: ERIA. https://www.eria.org/publications/the-comprehensive-asia-development-plan-cadp-30-towards-an-integrated-innovative-inclusive-and-sustainable-economy/

In 2022, global material consumption exceeded 100 billion tonnes annually. About 90% of these resources were exported by Global South countries for their own consumption, but often used by Global North economies. Despite vast production networks supplying multinational companies, investment in "end of use" infrastructure for products sold globally is limited,[20] especially in developing countries with nascent manufacturing, remanufacturing, recycling, and recovery capabilities. This can be overcome by creating a global EPR system to enhance capabilities in developing countries, contributing to a just transition.[21]

Multinational companies in the G20 must include supply chain constraints for circular material flow from final destinations to factories in their decisions. The scarcity of facilities at destinations must influence product design, involving supply chain actors for global collaboration on material efficiency. Producers must design circular processes throughout reverse logistics, including local actors in the Global South. They can incentivise circularity by facilitating material recovery systems. G20 countries can formulate practical product recovery guidelines and collection systems in the Global South by encouraging remanufacturing, refurbishing, and repair. Thus, G20 countries should create favourable conditions for a global EPR standard between developed and developing countries.

Beyond field-level Kaizen, optimising business processes to eliminate "waste of time and processes" is crucial. Overcoming information-sharing challenges among stakeholders (government, industry, public) in the Global South is key. Promoting new systems using modern digital technology, like blockchain, is essential to address this.

[20] Calzolari, T., Genovese, A. & Brint, A. (2021). The adoption of circular economy practices in supply chains – An assessment of European Multi-National Enterprises. J Clean Prod 312, 127616
[21] Maitre-Ekern, E. (2021) Re-thinking producer responsibility for a sustainable circular economy from extended producer responsibility to pre-market producer responsibility. J Clean Prod 286, 125454

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