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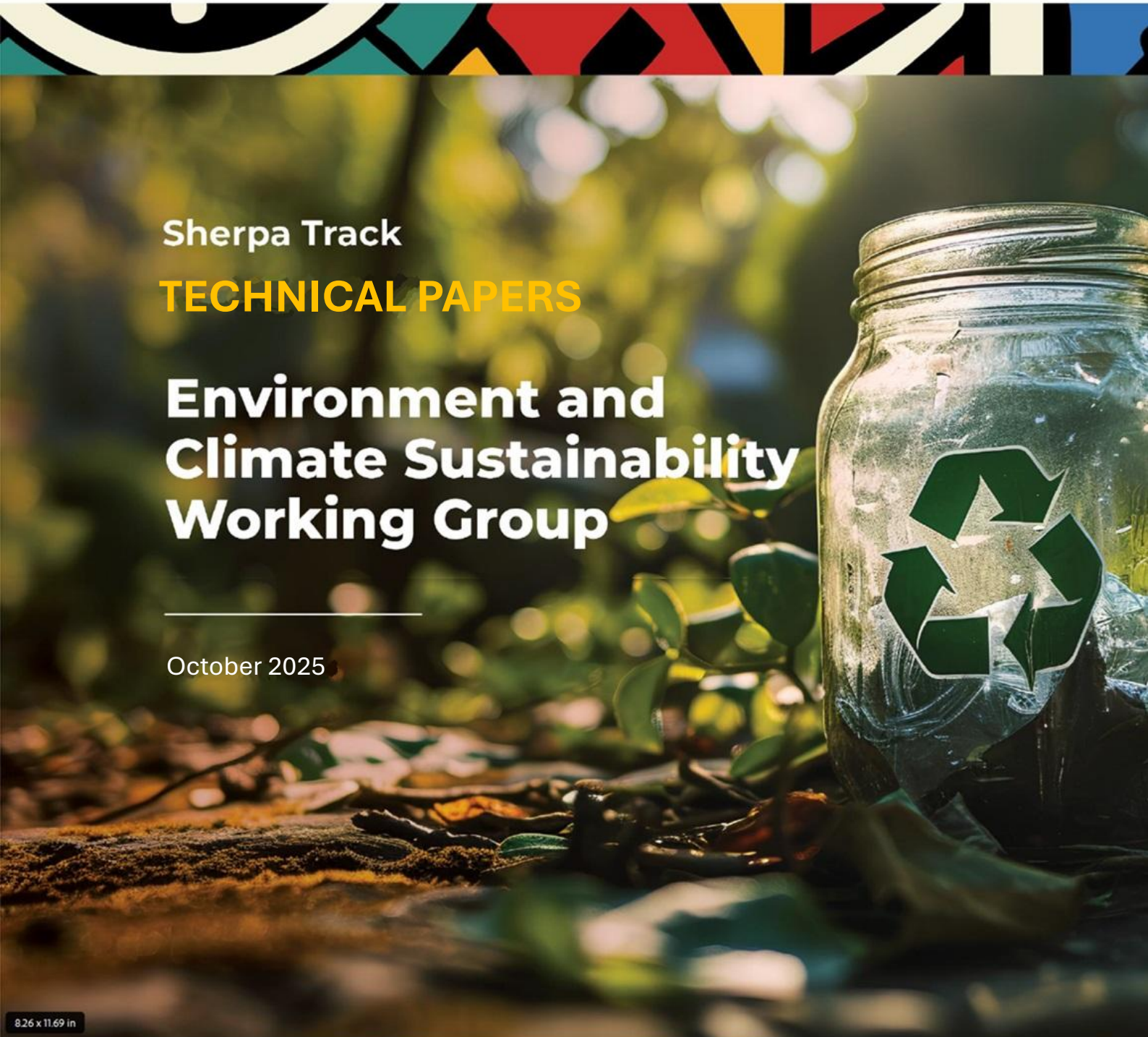

Sherpa Track

TECHNICAL PAPERS

Environment and Climate Sustainability Working Group

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SHERPA TRACK

Environment and Climate Sustainability Work Group (ECSWG)

Circular Economy and Extended Producer Responsibility (EPR)

How G20 countries are embedding circular economy in policy frameworks and implementing Extended Producer Responsibility (EPR)

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[1] *This paper is a Technical Paper commissioned by the South African Department of Forestry, Fisheries, and the Environment (DFFE) to enrich and inform the discussion and deliberations of the 2025 G20 Environment and Climate Sustainability Working Group (ECSWG) during South Africa's G20 Presidency. Although the paper was subjected to various reviews by G20 Members, invited Guest Countries, and International Partners, the views, opinions, findings, and conclusions or recommendations expressed in these papers are those of the author(s) and do not necessarily reflect those of the G20 or the DFFE.*

EXECUTIVE SUMMARY

The circular economy offers an opportunity to decouple economic growth from resource consumption by designing out waste and pollution, circulating products and materials, and regenerating nature. In doing so, the circular economy addresses interconnected global challenges, from climate change and biodiversity loss to material insecurity and pollution. Under South Africa's 2025 G20 Presidency, the ECSWG is well-positioned to advance this transition through coordinated action, knowledge exchange, and policy alignment.

Circular economy policy in G20 national policy frameworks is fragmented. While examples of circular policy innovation and best practices can be found across the G20, challenges remain around limited linkages to upstream design policies, underutilised fiscal and market levers, limited cross-ministerial coordination, and underdeveloped data and measurement systems. Addressing these barriers will require a comprehensive and coherent policy approach.

The paper recommends that G20 members:

- *Strengthen international coherence by aligning circular economy frameworks through multilateral platforms and shared implementation pathways*
- *Target high-impact sectors with tailored policy packages combining design standards, market incentives, measurement and monitoring systems, and infrastructure investment*
- *Embed circularity in innovation and industrial strategies by advancing enabling technologies and public–private partnerships*
- *Align fiscal and financial systems through subsidy reform and instruments like circular public procurement and blended finance*
- *Support inclusive capacity-building and governance by investing in skills and multi-level mechanisms that foster cross-sector collaboration*

EPR is one of a suite of policy instruments available to support the broader circular economy transition. It shifts the financial and operational responsibility of end-of-life products to producers and can incentivise producers to design products for a longer lifespan.

To maximise its potential, the paper recommends that G20 members:

- *Design EPR schemes around shared principles: mandatory, fee-based structures; eco-modulated fees; measurable performance targets; and transparent, multi-stakeholder governance*

- *Promote inclusive implementation by recognising informal sector contributions*
- *Strengthen global material traceability and enhance transboundary cooperation*

EPR is just one example of the policy instruments needed to drive systemic change within a broader circular economy policy mix. As stewards of over 80% of global GDP, G20 members have both the responsibility and opportunity to lead. By advancing aligned, inclusive, and ambitious policy action, the G20 can help shape a just, circular, and climate-resilient global economy that protects biodiversity and regenerates natural ecosystems.

1 INTRODUCTION

1.1 Scope and Objectives

This technical paper has been written by the Ellen MacArthur Foundation at the request of South Africa's Presidency of the Group of Twenty (G20). It serves as a reference document for the subcommittee discussion on circular economy[2] and Extended Producer Responsibility (EPR) implementation under the Chemicals and Waste Management priority, and the theme "Solidarity, Equality, Sustainability".

It explores how G20 members are adopting the circular economy and EPR, a key policy instrument to operationalise it. While the circular economy provides a broad solutions framework for sustainable resource use, EPR serves as an example of a key policy mechanism to realise these principles in practice.

The paper begins by outlining current multilateral discussions on circular economy and their coherence[3] with global environmental governance frameworks, followed by evidence-based insights on trends across the G20 and Africa. It identifies priority waste streams and sectors with high potential for transformation before moving on to examine the technology and

[2] Circular economy: A systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature. It is underpinned by a transition to renewable energy and materials. Transitioning to a circular economy entails decoupling economic activity from the consumption of finite resources (Ellen MacArthur Foundation, 2021d).

[3] Policy coherence: The systematic promotion of mutually reinforcing policy commitments across government departments and agencies creating synergies towards achieving the agreed objectives (OECD, 2024a).

innovations; financial mechanisms and fiscal instruments; and the capacity building and knowledge transfer needed to support circular business models. This is followed by a deep dive on EPR. Finally, the paper ends with considerations for the G20 to take forward in policy discourse that strengthen global commitments towards sustainable waste management, circular economy adoption, and climate resilience.

1.2 Introduction and background

South Africa's G20 Presidency occurs amidst multiple global crises, including climate change, socioeconomic inequality, poverty, hunger, unemployment, technological transformation, and geopolitical instability. The UN Sustainable Development Goals (SDGs) Report 2024 revealed that only 17% of SDG targets are currently on track, with nearly half showing minimal or moderate progress, and progress on over one-third has stalled or even regressed (UN, 2024). These figures highlight an urgent need for more effective and accelerated action. The implementation of existing international frameworks, including the 2030 Agenda and its SDGs, is not delivering solutions at the pace and scale required to meet today's complex crises.

Against this backdrop, the ECSWG has a crucial opportunity and responsibility to drive impact. Central to its mission is strengthening the environmental dimension of the 2030 Agenda through ambitious priorities and targeted deliverables. Among these, scaling up circular economy and EPR approaches has emerged as a powerful, actionable pathway to both advance the G20's sustainable development objectives and serve as an economic pathway to better growth (G20 South Africa, 2024).

The **circular economy** provides a framework for economic renewal, driving innovation and industrial transformation. Crucially, it goes beyond waste management and recycling. By redesigning production and consumption systems, it fosters new forms of value creation that strengthen the relationship between the economy, people, and the environment, supporting more resilient growth (Ellen MacArthur Foundation, 2021e). As a design-led approach, the circular economy addresses pressing global challenges — such as the triple planetary crises of waste and pollution, climate change, and biodiversity loss — by eliminating waste, keeping materials in use, and regenerating natural systems.

Momentum is building, with the concept increasingly reflected in the G20 agenda, particularly through the G20 Resource Efficiency Dialogue (RED), a key platform for circular economy cooperation since 2017 (G20 Germany, 2017).

EPR, traditionally used as a waste management policy, has significant potential to evolve into a driver of circular economy outcomes. It is a policy approach that extends a producer's responsibility to a product's after-use stage, requiring companies introducing products to a

market to finance their collection and treatment at the end of life (OECD, 2016; Ellen MacArthur Foundation, 2024c).[4] This can deliver the dedicated, ongoing, and sufficient funding needed to establish collection systems at scale and to cover the net cost of managing all discarded products (Ellen MacArthur Foundation, 2024c). EPR has featured in G20 dialogues since 2020, including through the T20's[5] work on plastic products and packaging material (Bakshi, Bhattacharjya and Meidl, 2020), and was recognised as a promising circular economy instrument under India's 2023 G20 Presidency (G20 India, 2023).

2 CURRENT MULTILATERAL DISCUSSIONS

2.1 Circular economy in the G20

Over recent years, the G20 has progressively embedded circular economy principles and EPR into its sustainability agenda. Beginning with Germany's 2017 Presidency, which introduced the G20 RED, successive presidencies, including Japan (2019), Italy (2021), Indonesia (2022), India (2023), and Brazil (2024), have expanded their focus from marine plastic litter and food waste to more systemic circular economy strategies (G20 Brazil, 2024). India's G20 Presidency (2023) notably advanced the global conversation on EPR as a critical enabler of circularity, compiling a comprehensive technical document that outlines EPR models, implementation frameworks, and case studies across G20 members. During Brazil's 2024 Presidency, a vision for an inclusive circular economy was introduced, urging action on involving informal waste workers in formal systems and promoting EPR schemes as a tool for social equity and sustainable development (G20 Brazil, 2024).

Under South Africa's 2025 Presidency, the ECSWG continues this trajectory by aiming to strengthen G20 commitment and collaboration on the circular economy with EPR as a key policy instrument. In particular, this includes the development of action plans and legislation, capacity building, support for small enterprises, knowledge exchange, enhanced implementation, compliance, and monitoring across all levels (G20 South Africa, 2024).

[4] The design and implementation of EPR schemes vary across countries. For instance, some countries have adopted a shared responsibility framework for products' life cycles, in which producers, importers, retailers, public authorities, and other actors share obligations for collection and treatment at the products' end of life (e.g. Brazil's National Solid Waste Policy, Law 12,305).

[5] The T20 (Think20) brings together think tanks, G20 research institutes and countries invited by the rotating presidenc, to produce, discuss, consolidate and present ideas on how to face current and emerging challenges that may be addressed by the G20.

2.2 Circular Economy in the Context of Other Multilateral Discussions

Beyond the G20, key international frameworks have recognised the role of the circular economy. This signals a growing international consensus that transitioning to a circular economy is essential, not only for environmental resilience, but also for building inclusive and resilient global economies.

The United Nations Environment Assembly (UNEA) has recognised the value of circularity through a series of landmark resolutions, including UNEA Resolution 4/1 (2019), UNEA Resolution 5/11 (2022), UNEA Resolution 5/14 (2022) and UNEA Resolution 6/1 (2024).[6] The first Global Stocktake, initiated as part of the Paris Agreement to assess collective progress on its long-term goals, recognised the importance of transitioning to sustainable lifestyles and sustainable patterns of consumption and production in efforts to address climate change – including through circular economy approaches – and encouraged efforts in this regard (UNFCCC, 2023). This momentum was reinforced at COP29 through the first Ministerial Meeting on Circular Economy, which spotlighted the role of material efficiency and circular strategies in addressing the drivers of greenhouse gas emissions (UNEP, 2024).

The circular economy has also been recognised for the contribution it can make to the SDGs, especially to SDG 12 (Responsible Consumption and Production) (MacArthur, 2019), but also to the remaining 16 goals (Schröder and Barrie, 2024; UNEP, 2024), by offering a systemic approach to achieving economic prosperity, environmental sustainability, and social well-being.

The Convention on Biological Diversity's (CBD) Kunming-Montreal Global Biodiversity Framework does not explicitly recognise the circular economy as a means to deliver the global biodiversity objectives, but it aligns with circular economy principles, particularly in tackling unsustainable production and consumption. While not yet widely reflected in national biodiversity strategies and action plans, circular approaches and business models

[6] UNEA Resolution 4/1 (2019) promoted resource efficiency and circular practices across sectors (UNEP, 2019b), while UNEA 5/11 (2022) formally acknowledged the circular economy as a critical pathway to address climate change, biodiversity loss, land degradation, and the impact of water stress, pollution and the impact thereof on human health (UNEP, 2022a). UNEA Resolution 5/14 initiated the development of a legally binding instrument to end plastic pollution, recognising that tackling plastic pollution at scale requires systemic circular economy interventions (UNEP, 2022b). Although the negotiations at INC-5.2 were suspended without reaching an agreement, the process continues to underscore the need to eliminate problematic plastics, foster product design to circulate products and materials safely, and innovate away from the linear "take-make-waste" model (Ellen MacArthur Foundation, 2024a). Most recently, UNEA Resolution 6/1 (2024) reinforced the relevance of circular strategies in agro-industrial sectors (UNEP, 2024).

will be essential to transforming economic systems to value, preserve, and regenerate nature.

In line with this global momentum, the Co-Chairs of the International Resource Panel have called for stronger international stewardship of sustainable material use, including through the potential creation of an International Materials Agency to close governance and data gaps (International Resource Panel, 2025), which aligns closely with circular economy principles of keeping products and materials in use at their highest value.

3 TOWARDS A GLOBAL CIRCULAR ECONOMY: CURRENT STATE AND POLICY ENABLERS

3.1 Assessing the Circular Economy Transition in the G20

The G20 RED has established a policy foundation for circular economy cooperation (G20 Germany, 2017). As stewards of over 80% of global GDP (OECD, 2025), G20 members have both the responsibility and opportunity to lead.

As of 2024, 75 national-level circular economy strategies (including roadmaps, operational strategies, and calls to action) had been launched globally (Chatham House and UNIDO, 2024). These frameworks vary widely in scope and coherence, ranging from high-level visions to time-bound, legislatively backed action plans (Chatham House and UNIDO, 2024). At least 12 G20 members have a circular economy strategy or roadmap in place, representing almost 50% of global GDP, and these, combined with the growing uptake of circular policy instruments across other national policy documents, as well as the growing number of city and subnational circular economy strategies, demonstrate how the circular economy is gaining traction across the G20 (OECD, 2021).

Examples of circular policy innovation and best practices can be found across the G20, particularly regarding investments in interdisciplinary research, support of blended financial solutions, and workforce training. G20 members are also taking clear steps to integrate circular economy principles into broader national policy frameworks and data measurement efforts. However, few have established standardised metrics or tracking frameworks, hampering efforts to align national progress with global goals. This measurement gap is mirrored in the lack of harmonised international standards and legal definitions, which poses a major barrier to cross-border cooperation, particularly in secondary materials trade (Ellen MacArthur Foundation, 2025b).

Experiences from G20 members highlight that long-term political commitment, whole-of-government coordination – including alignment with sub-national governments to fully leverage the role of cities in the transition (OECD, 2021), and bringing business voices to the

table to ensure emerging circular economy policies are complementary to existing voluntary business efforts – strong accountability mechanisms, and inclusive stakeholder engagement are key to successful implementation (Ellen MacArthur Foundation, 2025b). Countries assessed with the highest levels of policy coherence have not only adopted holistic strategies but also supported them with legislation and dedicated funding.

More policy innovation and implementation are needed across the board, but particularly on policies that stimulate design, manage resources, and make the economics work for a circular economy. Many G20 members express a clear intention to make policy commitments in both upstream design thinking and circular resource management, yet the implementation of upstream instruments remains limited, underscoring the technical and institutional complexity of operationalising circular principles at scale. Further, while sustainable public procurement policies are relatively well deployed, fiscal levers such as taxation and subsidies remain aspirational or underdeveloped in most G20 members, limiting governments' ability to shift incentives away from linear models (Ellen MacArthur Foundation, 2025b). Finally, the policy landscape remains fragmented, with varying levels of ambition and implementation (UNEP, 2020; Ellen MacArthur Foundation, 2025b). Fragmentation is compounded by unsuitable institutional structures: circular economy governance often resides within environmental ministries with limited cross-ministerial coordination, leading to missed cross-cutting opportunities and undermining integration with climate, biodiversity, and industrial strategies (Ellen MacArthur Foundation, 2025b).

Opportunities for G20 members to consider: Advancing system change requires holistic policy commitments, improved coherence, and coordinated action across five key policy areas:[7] (1) stimulating circular design, (2) enabling effective resource management to preserve material value, (3) making the economics work for circular business models, (4) investing in innovation, infrastructure, and skills, and (5) fostering both multi-level government — including national, regional, and local authorities — and multistakeholder collaboration. Beyond improving national policy coherence, G20 members can strengthen international cooperation by aligning circular economy frameworks through multilateral platforms and shared implementation pathways.

3.2 African Leadership and Innovation in the Circular Economy

South Africa has emerged as a circular economy leader in Africa, helping to found the African Circular Economy Alliance (ACEA) in 2017 together with Rwanda and Nigeria (World

[7] The Ellen MacArthur Foundation has set out five universal circular economy policy goals that provide a framework for national governments, cities and businesses to accelerate the transition (Ellen MacArthur Foundation, 2021e).

Economic Forum, 2020), implementing a comprehensive national waste framework, including EPR (DFFE, Republic of South Africa, 2020), and — led by the African Circular Economy Network (ACEN) — developing Circular South Africa (CSA), a national circular economy stakeholder platform (Circular South Africa, n.d.). Additionally, the Department of Science, Technology and Innovation (DSTI) has developed a Circular Economy Science, Technology and Innovation Strategy, with support from the Council for Scientific and Industrial Research (CSIR), which also has several circular economy research and demonstration projects (CSIR, n.d.). The Department of Forestry, Fisheries and the Environment (DFFE) has tendered for a national circular economy action plan to be developed (DFFE, Republic of South Africa, 2024), further demonstrating its commitment to advancing implementation.

But South Africa is far from alone. Political momentum has accelerated in recent years, catalysed by ACEA, whose membership has grown to 15 countries (World Economic Forum, 2020; ACEA, n.d.). The 2019 Durban Declaration at the 17th African Ministerial Conference on the Environment (AMCEN) marked the first pan-African policy statement on the circular economy, reaffirmed at AMCEN-18 and -19 (UNEP and AMCEN, 2019, 2021, 2022). Building on this, the African Union, at its 37th Assembly, endorsed the Continental Circular Economy Action Plan, published in September 2025, to guide the continent's transition toward a circular, resilient, inclusive, and nature-positive economy (African Union, 2025).

As of 2025, at least 12 African countries have published national circular economy strategies, and many more are integrating circular principles into waste and plastics policy. Bans on single-use plastics are now in force in 36 countries, and 16 have introduced EPR schemes. Countries such as Rwanda, Kenya, and Tunisia are embedding circularity in broader development plans (Attafuah-Wadee and Tilkanen, 2020).

Opportunities for G20 members to consider: Despite challenges in enforcement, capacity, and data, momentum continues to grow, and African countries offer unique insights into circular economy implementation through informal sector models, community-led and decentralised infrastructure solutions, and innovations that often operate with limited resources (Attafuah-Wadee and Tilkanen, 2020; Rademaekers *et al.*, 2020; World Economic Forum, 2021; Okoya *et al.*, 2023). G20 members can actively engage with and learn from these experiences to inform more context-adapted, inclusive, and resilient circular strategies globally.

3.3 Prioritising Waste Streams and High-Circularity Sectors

Although the circular economy transition requires a whole-of-economy, and therefore whole-of-government, approach, global efforts so far have prioritised sectors with the highest potential for circular interventions — those characterised by high material intensity

and waste generation, substantial environmental footprint, opportunities for system-wide redesign, and increasingly, their relevance to economic resilience and material security. This lays important groundwork for the changes required at the macroeconomic level, and also aligns closely with the G20's overarching priorities of strengthening global commitments towards sustainable waste management, circular economy adoption, and climate resilience. The prioritised sectors include packaging and plastics, consumer goods including textiles and electronics, food and agriculture, and the built environment. Organisations like the United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO), United Nations Office for Project Services (UNOPS), World Economic Forum (WEF), Organisation for Economic Co-operation and Development (OECD), ACEA, Global Green Growth Institute (GGGI), ACEN, and the Ellen MacArthur Foundation are focusing on one or more of these areas.

While a sectoral approach is a strong starting point, policies must also address all areas of the economy, including low-value waste streams, through regulation and targeted subsidies for their safe collection and disposal. In parallel, cross-sectoral instruments — such as digital product passports and national roadmaps — can help align efforts across sectors and support systemic change.

3.3.1 Packaging and Plastics

Packaging and plastics typify the linear economy, where virgin resources are extracted, transformed into short-lived products, and ultimately discarded as waste. Plastics have made packaging much more cost-effective for companies, enabling widespread distribution, but their true costs are externalised, shifted to taxpayers via local waste systems, or to nature through pollution and degradation. Waste management systems in many parts of the world are already struggling to cope with current volumes and are not equipped to handle the increasing quantities placed on the market, nor tackle the unsustainable use of plastics. The material complexity and short use phase of packaging exacerbate the problem, driving pollution and resource inefficiency.

With the annual volume of plastics entering the ocean projected to almost triple, from 11 million tonnes in 2016 to 29 million tonnes by 2040 (Ellen MacArthur Foundation, 2022d), plastic packaging presents both a critical challenge and a major opportunity. While voluntary efforts, such as the Global Commitment, have demonstrated real progress uniting leading governments, businesses, and investors, even this initiative only currently represents 20% of the global market (Ellen MacArthur Foundation, 2023c). Changing the plastic packaging industry to create a circular economy will require closing the 80% gap and addressing every stage of its lifecycle — eliminating problematic and unnecessary packaging, innovating to ensure all packaging is reusable, recyclable, or compostable, and circulating all packaging in the economy and out of the environment.

Opportunities for G20 members to consider: As the world's largest economies and major plastic consumers, G20 members have a unique opportunity, and responsibility, to eliminate plastic pollution and waste. They can take immediate action by developing national legislation and programmes aligned with circular economy principles, for instance by implementing and strengthening EPR schemes, and by coordinating across the G20 to deliver the harmonisation and scale needed for investment in innovation, infrastructure, and compliance. While national and G20-level action is foundational, there is an urgent need for coordinated international action. Although negotiations towards a legally binding instrument to end plastic pollution have not yet concluded, G20 members can play a vital role in sustaining momentum, fostering alignment around ambitious circular economy goals, and ensuring progress continues (Ellen MacArthur Foundation, 2024a; OECD, 2024b).

3.3.2 Fashion and Textiles

Today, more than 80% of textiles are incinerated, landfilled, or leak into the environment after being discarded by their user. This is driven on the one hand by linear business models reliant on virgin materials and fast production cycles, economies of scale that incentivise high volumes to reduce unit prices, and marketing strategies that stimulate frequent purchases and short product use phases; and on the other hand by a lack of infrastructure for separate collection, sorting, reuse, and recycling. Poor design for durability and recyclability, combined with underdeveloped systems for separate collection and sorting, makes circularity economically and operationally challenging (Ellen MacArthur Foundation, 2024c).

Yet, this also presents a clear opportunity. A circular economy for fashion, where garments are used more, made to be remade, and produced from safe, recycled, or renewable materials, can strengthen economic resilience while drastically reducing environmental impacts (Ellen MacArthur Foundation, 2023b). Circular business models such as resale, repair, rental, and remaking could account for nearly a quarter of the global fashion market by 2030, unlocking a USD 700 billion opportunity (Ellen MacArthur Foundation, 2021a). EPR is one of the policy frameworks that can unlock this potential (Brown and Börkey, 2024).

Opportunities for G20 members to consider: G20 governments can play a catalytic role by introducing policies that mandate circular product design requirements, support the development of separate textile collection, sorting, and reuse infrastructure via mandatory-fee based EPR schemes, and exploring tax reforms that will incentivise circular business models. Additional measures could include environmental fee modulation based on product impact, regulation of marketing practices driving short product lifespans, and improved transparency on the environmental performance of textile products. Policy design should recognise the different legal and market constraints across countries to be truly effective.

3.3.3 Electronics

Electronics are among the fastest-growing global waste streams, generating over 62 million tonnes of e-waste in 2022, with only 22.3% formally collected and recycled (UNITAR, 2024). This growth is driven by planned obsolescence, complex design, and limited options for repair and upgrades. Yet, the sector holds significant potential for circular transformation through strategies such as designing for durability, modularity, and repairability, and scaling reuse, refurbishment, and responsible recycling.

Early progress is visible in pilot programmes and circular business models, including refurbished offerings and subscription-based services (Ellen MacArthur Foundation, 2018). Public-private collaboration is proving essential with roadmaps like the Circular Electronics Initiative (CEI), the Circular Electronics Partnership (CEP), and the Partnership for Action on Challenges relating to E-waste (PACE II) highlighting the policy, infrastructure, and market shifts needed for scale (PACE, 2021; CEP, 2024; Basel Convention, n.d.). Programmes such as the Sustainable Recycling Industries (SRI), implemented by the Swiss State Secretariat for Economic Affairs (SECO) in Ghana, Egypt, and South Africa, further illustrate this potential by promoting the sustainable integration of small and medium enterprises (SMEs) into the global secondary resource markets (SRI, n.d.).

Enhancing product traceability and transparency is also key to enabling circular flows — tools like digital product passports can support better tracking of material use across value chains. Furthermore, aligning industrial innovation with circular principles can generate jobs, enhance material security, and reduce emissions (Ellen MacArthur Foundation, 2019b; PACE, 2021), as demonstrated by China's circular innovation zones, where coordinated urban and industrial policy drives both competitiveness and environmental outcomes (Ellen MacArthur Foundation, 2019b).

Opportunities for G20 members to consider: G20 members can support these efforts through a policy mix including, but not limited to, mandating design standards and a right to repair for electronics; setting ambitious collection targets and enforcing EPR schemes; investing in reverse logistics, product traceability tools and secondary materials markets; and revising waste shipment and management regulations, alongside realistic measures suited to particular national contexts.

3.3.4 Food and Agriculture

Today's food system is failing both people and the planet. Industrial agriculture is a major driver of greenhouse gas emissions, biodiversity loss, and pollution, while nearly one-third of food produced is wasted, even as millions go hungry. A circular economy offers a powerful alternative: one that regenerates nature, eliminates food waste, and provides healthy, nutritious food for all. Regenerative agriculture, through practices like agroforestry, crop

diversity, and rotational grazing, can rebuild soil health, improve biodiversity, and make agricultural systems more resilient to climate and market shocks. At the same time, designing out food waste through prevention, redistribution, and valorisation of inedible by-products can close resource loops and reduce environmental burdens. Reducing harmful inputs — such as excessive pesticide use and agricultural plastics — is also essential to minimise pollution and build long-term ecosystem resilience. In this context, circular solutions can also extend to integrated pest management, pesticide reduction, and new business models like chemical leasing for more efficient use of agrochemicals. Better aligning supply and demand is also critical to reducing oversupply and unnecessary waste, helping to ensure that food reaches those who need it while avoiding avoidable losses across the system (Ellen MacArthur Foundation, 2021c).

Opportunities for G20 members to consider: G20 members can influence change by aligning agricultural policies with regenerative outcomes, supporting infrastructure to reduce food loss and waste, and expanding innovations that redirect surplus food to where it's needed most. A key enabler is to create the incentives and standards that spur industry to redesign food products and portfolios, for example, reformulating offerings to use regenerative or by-product ingredients. By shaping policies that encourage circular design, through public procurement, incentives, or labelling standards, governments can accelerate a shift away from waste-intensive models.

3.3.5 Built Environment

The built environment accounts for nearly half of all materials extracted each year and contributes significantly to greenhouse gas emissions. With global construction demand projected to add the equivalent of one city the size of Paris every week until 2060, there is a critical window for the G20 to shape a more resilient, resource-efficient system (UNEP, 2017). Applying circular design principles — including regenerative approaches — offers a major opportunity to reduce emissions, cut material use, generate employment, and activate the economy, while creating more liveable, economically vibrant urban spaces.

In Europe, circular approaches that regenerate nature — such as increasing green and blue cover, expanding tree canopies, redeveloping brownfield sites, employing material-efficient design, and using low-impact materials, including bio-based materials — could unlock over half a trillion euros annually by 2035 (Ellen MacArthur Foundation, 2024b). Achieving this potential requires going beyond waste management, and embedding targets for circular product design, material efficiency, and extended lifespans of building elements. Instruments like sustainable public procurement, targeted taxation, and blended finance models can scale innovation and investment across the sector (Ellen MacArthur Foundation, 2025a). The National Circularity Assessment Framework (NCAF) Toolkit, developed by UNEP, UNOPS, UN-Habitat, and over 50 experts, provides countries with a practical, globally

applicable methodology to develop circularity roadmaps and accelerate national action in the built environment (One Planet Network, 2024).

Opportunities for G20 members to consider: G20 members can lead by integrating circular approaches and nature-based solutions, aligning fiscal and regulatory levers, strengthening circular monitoring systems, and investing in research and development (R&D) to support systemic transformation of the built environment that is both circular and regenerates nature.

3.4 Technology and Innovation for Circular Business Models

Technology and innovation are key drivers of the circular economy transition, enabling new business models and new product design. The G20 recognised the key role of technological innovation in 2024 by establishing the Research and Innovation Working Group (RIWG). New and emerging technologies, such as blockchain, the internet of things (IoT), artificial intelligence (AI) and immersive technologies, support the implementation of circular business models by increasing transparency, improving decision-making, and unlocking new value creation opportunities. However, as these technologies are adopted, their development must align with circular economy principles and all relevant stakeholders. Many rely on scarce and valuable materials, and their infrastructure is often energy- and resource-intensive. To avoid unintended trade-offs, technologies should be designed for durability, reparability, and material recovery. Embedding circularity into the technologies themselves ensures they support, rather than undermine, circular business models.

In particular, blockchain technology facilitates transparent and tamper-proof tracking of materials across supply chains, enabling reuse, remanufacturing, and recycling by providing real-time data on product composition, ownership, and condition. This is illustrated by the use of blockchain to track and trace the work of informal waste collectors in South Africa (Ellen MacArthur Foundation, 2022b), and to improve transparency in milk, palm oil, and coffee supply chains, helping to verify responsible sourcing from farm to factory (Nestlé Global, 2019; Nestlé Nespresso, n.d.). The IoT enhances supply chain visibility, supports predictive maintenance to extend product lifespans, and enables models like product-as-a-service, for example, to optimise the operation of building cooling systems (Ellen MacArthur Foundation, 2021b, 2022c). AI contributes by optimising operations through predictive analytics, automation, and intelligent resource allocation, improving energy use, logistics, and waste sorting (Barteková and Börkey, 2022). Immersive technologies, such as virtual, augmented, and mixed reality, help visualise circular systems and dematerialise experiences, fostering awareness and engagement (Ellen MacArthur Foundation, 2022a). For instance, the EU-funded ‘Farmer’s Intelligence Toolkit’ (FIT) project supports farmers

with real-time analytics through augmented reality, providing a streamlined crop management process (European Commission, 2019).

Opportunities for G20 members to consider: Advanced economies and emerging and developing economies face different challenges related to technological readiness, infrastructure, and investment capacity. The G20 is well-positioned to address these challenges and unlock the full potential of technological innovation in support of circular business models via international cooperation in areas such as technology transfer and collaboration along international supply chains, ensuring that technologies are accessible, affordable, and adapted to local needs.

3.5 Financial Mechanisms (Fiscal and Economic Instruments)

Transitioning to a circular economy requires coordinated public and private financing to scale innovation, infrastructure, and business models.

Development finance institutions such as the World Bank, European Investment Bank (EIB), and African Development Bank (AfDB) play a catalytic role by de-risking early-stage investments through concessional finance, guarantees, and technical assistance. The Circularity Exchange Network (CEN) exemplifies how multinational development banks (MDBs) are incorporating circular economy objectives into their sustainable development strategies (Circle Economy, 2025). Similarly, international platforms such as the UNEP Finance Initiative (UNEP FI), Platform for Accelerating the Circular Economy (PACE), and the World Business Council for Sustainable Development (WBCSD) have developed taxonomies, metrics, indicators, and disclosure tools to steer capital towards circular business models (UNEP FI, 2025; PACE, 2025; WBCSD, n.d.).

Climate finance can further support circular initiatives. The Circular Finance Roadmap offers guidance to embed circular principles into climate-related investment portfolios, strengthening their role in climate mitigation and adaptation strategies (Circle Economy and Dutch Ministry of Infrastructure and Water Management, 2022). Instruments like carbon finance, through Article 6 of the Paris Agreement, and green or sustainability bonds are increasingly supporting circular projects, with GGGI issuing billions of US dollars in green bonds to national governments (Republic of Rwanda, REMA and GGGI, 2024; GGGI, 2025).

Recent years have seen substantial growth in circular investments: between 2019 and 2021, assets in circular equity funds rose from USD 0.3 billion to over USD 8 billion, with over 35 corporate and sovereign bonds issued to support circular activities (Bocconi University, Ellen MacArthur Foundation, and Intesa Sanpaolo, 2021). The EIB has invested more than EUR 5 billion in 153 circular economy projects since 2020 (European Investment Bank, 2025),

while the African Circular Economy Facility (ACEF) aims to build on its current EUR 9 million capitalisation and secure an additional EUR 10 million by 2026 (AfDB, 2025).

Fiscal instruments play a vital role in stimulating demand and reducing risk, including public-private partnerships, sustainable public procurement, and tax reforms, such as shifting burdens from labour to virgin resource extraction, and aligning subsidies with circular economy principles (UNEP FI, 2020; Ellen MacArthur Foundation, 2021e; UNECE, 2022). Blended finance instruments and EPR schemes can unlock additional capital.

Scaling the circular economy requires both regional coordination and better support for informal workers and SMEs that drive repair, reuse, and resource recovery in many G20 economies. The African Continental Free Trade Area (AfCFTA), connecting 54 countries and a USD 3.4 trillion market, offers a platform to grow circular SMEs and cross-border supply chains (AfCFTA, 2024). To unlock investment, de-risking instruments, and tailored financial mechanisms are needed to overcome persistent risk perceptions and integrate these actors into formal financing channels.

Opportunities for G20 members to consider: G20 members are well-positioned to catalyse systemic shifts in how capital flows towards circular economy solutions because of their collective economic influence and their role in shaping global investment forums. By integrating circular economy priorities into global sustainable finance agendas, accelerating financial support to de-risk circular investments, and adopting fiscal instruments aligned with circular principles, G20 members can both stimulate demand for circular innovation and help mobilise financing for circular solutions.

3.6 Capacity building and knowledge transfer

Accelerating the circular economy requires coordinated capacity building and knowledge transfer across institutions, the private sector, and communities.

At the institutional level, education and vocational systems must embed circular principles, such as design for durability, systems thinking, and reverse logistics, into formal curricula. For example, India's Directorate of Education has introduced vocational courses in over 800 schools as part of the Samagra Shiksha scheme, equipping students with hands-on, industry-relevant skills (The Times of India, 2025). Reforming education systems is essential to equip future workers with both technical expertise and cross-sectoral competencies (Circle Economy, 2020; EESC, 2023).

Beyond formal education, knowledge-sharing networks, such as ACEA, ACEN, the European Circular Economy Stakeholder Platform (ECESP) and the Latin America and the Caribbean Circular Economy Coalition, play a key role in spreading best practices and aligning policies.

The ECSWG sub-working group on circular economy and EPR exemplifies international collaboration and leadership in this space.

Transitioning business models to circularity requires cross-cutting skills: systems thinking to understand interdependencies, design thinking for user-centric solutions, strategic leadership to drive change, and communication for stakeholder engagement. Yet, many businesses, especially SMEs, lack the clarity, capacity, or incentives to invest in upskilling (Circle Economy, 2020; EESC, 2023), highlighting the need for government support.

These skills must be embedded in ecosystems that foster supply chain integration and innovation, with support for technology and digital transparency (Ellen MacArthur Foundation, 2019b; Roland Berger, 2023). The World Circular Economy Forum (WCEF) accelerator session on "Developing essential skills for circularity" demonstrates how education providers, industry, and policymakers can co-develop training that addresses market needs and promotes inclusive access to emerging opportunities (World Circular Economy Forum, 2025).

In many G20 and emerging markets, the informal sector is vital for waste collection, repair, and reuse, often at little cost to governments or producers. In Kenya, it represents over 80% of employment and plays a central role in circular practices (Munro *et al.*, 2022). Yet, informal contributions are frequently excluded from policy, training, and certification systems. This marginalisation limits career prospects, particularly for youth and women, who face additional barriers like restricted access to apprenticeships. When supported by inclusive training, accreditation, and infrastructure, circular initiatives can create quality employment, particularly in labour-intensive sectors like repair and remanufacturing (Munro *et al.*, 2022; EESC, 2023; Ellen MacArthur Foundation, 2023a; Sitra, 2023).

Opportunities for G20 members to consider: Ultimately, building circular capacity requires breaking down silos between education, labour, and industrial policy, recognising informal skills, and creating inclusive pathways to decent work. Acknowledging the pivotal role of the informal sector in many economies, the G20 can lead by advancing integrated strategies that both recognise and harness these existing capacities. This includes education reform, public–private training, and inclusive workforce development, ensuring broad participation in the circular economy, and positioning the inclusion of informal workers as a key entry point for circular transitions.

The opportunities of the circular economy are broadly acknowledged, which has translated to the marked policy momentum we see today. To realise these opportunities, a full suite of policy instruments is needed, among them, one of the most established tools is EPR. The following section explains how well-designed EPR can translate circular principles into day-to-day practice, and why it should be established as a cornerstone of the wider policy architecture.

4 DEEP DIVE: DESIGNING EXTENDED PRODUCER RESPONSIBILITY TO SUPPORT A GLOBAL CIRCULAR ECONOMY

EPR holds the potential to deliver circular economy outcomes, shifting the financial and operational responsibility to producers and incentivising better product design. However, most EPR schemes focus on downstream waste management. This deep dive provides an overview of the current state of EPR implementation and explores opportunities to strengthen its role in supporting the circular economy agenda.

4.1 Extended Producer Responsibility in the G20

The 2023 G20 India Presidency technical paper "Knowledge Exchange on EPR for Circular Economy" marked a pivotal shift by formally linking EPR with the circular economy and the SDGs, broadening earlier discussions that focused primarily on plastic packaging waste. The paper offered a toolkit for EPR design, outlining key principles while emphasising the importance of local adaptation (G20 India, 2023).

EPR is increasingly being embraced by G20 members, with some countries adopting it as early as three decades ago. While a few proposed broad frameworks, most have taken a sector-specific approach, targeting packaging, electronics, batteries, tyres, and vehicles. More recently, EPR schemes have begun to expand to additional sectors such as textiles, furniture, and used oil (G20 India, 2023). EPR schemes are implemented in various forms across G20 countries, reflecting differences in regulatory frameworks, market conditions, and national contexts.

4.2 The Benefits of EPR for the Circular Economy

By making producers financially responsible for end-of-life product management, mandatory, eco-modulated, fee-based EPR schemes ensure dedicated, ongoing, and sufficient funding for separate collection and sorting systems to ensure materials are circulated back into use at their highest value. Despite extensive policy guidance (OECD, 2016; PREVENT Waste Alliance, n.d.; Basel Convention, 2019), EPR implementation has largely focused on downstream activities, such as collection, sorting, and often low-grade recycling. Yet, if it is designed with circular principles and implemented alongside complementary instruments, EPR can be a powerful enabler of the circular economy.

When well designed, EPR offers three additional systemic benefits: it attracts capital investment in the infrastructure needed to collect, reuse, and recycle materials at scale; it enables transparency and traceability of material and financial flows, essential for circularity and accountability; and it fosters collective action, aligning producers, regulators, and value

chain actors around common targets for collection, reuse, and recycling (Ellen MacArthur Foundation, 2024c).

By internalising end-of-use costs, EPR has the potential to shift incentives towards circular product design. Mechanisms like eco-modulation[8] encourage producers to prioritise reuse, repair, and recyclability. This also boosts domestic markets for secondary materials and supports job creation across reverse logistics, repair, and material recovery, generating new economic opportunities aligned with circular economy goals (Ellen MacArthur Foundation, 2021c).

While voluntary approaches can serve as entry points for early adopters, they tend to be fragmented, underfunded, and fail to offer a level playing field for businesses offering circular business models. In contrast, mandatory EPR systems provide the regulatory certainty needed to attract private and blended capital, and level the playing field. Without robust frameworks and complementary policies such as design standards, support for secondary materials markets, and resource classifications and definitions in waste, valuable materials will continue to be incinerated, landfilled, or lost to environmental leakage (Ellen MacArthur Foundation, 2024c).

To support change at scale, national EPR policies must align around shared principles. A common design approach for EPR schemes, anchored in circular economy objectives, can foster collective action while allowing local adaptation. Effective national systems require clear targets, standardised metrics, transparent reporting, and inclusive participation from producers, governments, civil society, and the informal sector (Brown, Laubinger and Börkey, 2023; Ellen MacArthur Foundation, 2024c; World Bank, 2024).

4.3 The role of Producer Responsibility Organisations

In most EPR schemes, producers typically transfer their obligations to a Producer Responsibility Organisation (PRO), which acts on their behalf. Producer fees fund the collection, recycling, and data management systems required to meet regulatory goals (World Bank, 2023). These schemes work only when funds are legally dedicated and transparently managed. Without robust regulatory oversight, countries with a single PRO risk becoming unaccountable monopolies, whilst countries with multiple PROs risk both a 'race to the bottom' with PROs lowering EPR fees to remain competitive, as well as challenges in identifying free riders. To function effectively, PROs must operate under clear, performance-based regulation, use transparent cost structures, procure services competitively, undergo

[8] Eco-modulation involves the modification of fees paid by producers in an EPR scheme based on product design criteria that rewards producers going beyond the minimum requirements of regulations (Laubinger *et al.*, 2021).

regular audits, and include multi-stakeholder governance, particularly involving civil society and the informal sector (Brown, Laubinger and Börkey, 2023; Ellen MacArthur Foundation, 2024c; World Bank, 2022; World Bank, 2024).

4.4 Inclusion of the Informal Sector in EPR Policy

Informal waste pickers provide essential environmental and public services by recovering and recycling significant volumes of materials, yet they are often unrecognised and underpaid (Ellen MacArthur Foundation *et al.*, 2025; World Bank, 2023). Their involvement in EPR systems is both a social imperative and a strategic opportunity, as it helps ensure a scheme functions effectively. Without the inclusion of all stakeholders, efforts are likely to be undermined by conflicting interests, for example, informal workers continuing to focus only on specific materials with the highest value, rather than recovering all materials (World Bank, 2022; World Bank, 2024).

Several G20 members have made efforts to formalise the role of the informal sector with mixed outcomes (WIEGO, 2022; G20 India, 2023). Before formal EPR frameworks were introduced, waste pickers in countries like India, Brazil, and South Africa played a critical role in the waste management sector, often achieving recycling rates on par with European countries, with little recognition or support (G20 India, 2023). India's early EPR policies mandated their inclusion, but recent, corporate-led models risk marginalising waste pickers (WIEGO, 2022). In Brazil, efforts to include waste pickers through shared responsibility and cooperative support were undermined by weak enforcement, insufficient funding, and limited municipal involvement (WIEGO, 2022). In South Africa, despite collecting the majority of recyclables, waste pickers remained underpaid until 2021 EPR regulations mandated their registration, compensation, and representation, though progress has been slow amid institutional transitions and evolving PRO priorities (PREVENT Waste Alliance, 2025; WIEGO, 2022; World Bank, 2023).

4.5 Creating a Common Understanding of EPR across Borders

Post-consumer products and materials increasingly cross borders for reuse, refurbishment, or processing. Yet, most EPR regulations end producer responsibility at the point of export, limiting the ability to manage discarded products where they ultimately end up. As global trade in reusable and waste products grows, extending EPR across borders needs to be explored to achieve a global circular economy, helping to track materials across jurisdictions (Brown, Laubinger and Börkey, 2023; GIZ, 2023; Ellen MacArthur Foundation, 2024c). Importantly, such approaches must not be used to justify the transfer of waste management burdens from developed to developing countries, but rather to ensure that responsibility and resources follow material flows. Robust EPR systems require transparent data to monitor

material flows, measure impact, and support enforcement. Digitalisation, through interoperable platforms and reporting protocols, can enable real-time data exchange between producers, regulators, and PROs (Brown, Laubinger and Börkey, 2023; G20 India, 2023).

The Global Action Partnership for Extended Producer Responsibility (GAP for EPR) serves as a valuable example of international cooperation. By fostering a shared understanding of EPR, supporting country-specific approaches, and building a global knowledge community, it demonstrates how platforms formed by multiple agencies can strengthen EPR frameworks and ensure that responsibility follows materials beyond borders (GAP for EPR, 2025).

4.6 Embedding EPR into a Broader Policy Mix to Support the Transition to a Circular Economy

EPR is most effective when embedded within a comprehensive circular economy policy framework. Currently, it sets the foundation for downstream system change, through measures including incentives to increase proper separation and collection, diverting or banning waste from landfill and incineration, and waste management policies that ensure environmentally sound disposal during the transition. However, to fully realise circular economy outcomes, these measures must be paired with upstream measures, such as product design regulations (e.g. reparability and durability), eco-modulated fees to incentivise better design, producer registers that track what products and quantities are placed on the market (essential for allocating EPR fees fairly and preventing freeriding), and market incentives for reuse and refurbishment. Public procurement and innovation funding can further support these shifts.

This policy mix combining both downstream and upstream measures ensures that production and recovery systems reinforce one another, unlocking systemic change (Ellen MacArthur Foundation, 2021e, 2024c).

4.7 Remaining Barriers to EPR

Despite the potential benefits EPR can deliver, implementation of EPR schemes to date has faced persistent barriers, including insufficient enforcement mechanisms, lack of reliable data infrastructure, industry resistance, and low public awareness. Donor-supported programmes, such as the work of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in Small Island Developing States, show that donor support, technical cooperation, and stakeholder capacity building are essential, especially where institutional and financial resources are limited (OECD, 2016; Brown, Laubinger and Börkey, 2023; GIZ, 2023).

Opportunity for the G20 to consider: To deliver circular economy outcomes, EPR must evolve (Laubinger *et al.*, 2021). The G20 has a dual opportunity: first, by supporting the development of EPR schemes that finance critical infrastructure, drawing on lessons from established models, and second, by championing a next-generation EPR approach that promotes upstream measures such as circular product design, extended use through reuse and repair, and reducing pollution. Even when starting with downstream infrastructure, the design of EPR schemes should anticipate and enable upstream action from the outset.

For G20 economies, EPR can be a strategic lever to accelerate the transition to a global circular economy. When implemented as a mandatory, eco-modulated fee-based system, EPR goes beyond managing waste; it channels investment, reducing pressure on public budgets; increases efficiency for waste management systems through increased access to market information, transparency, and data-driven decision making; and aligns collective action across borders and value chains. To maximise these benefits, the G20 can play a pivotal role in establishing a shared understanding of EPR by promoting international harmonisation — particularly around eco-modulation design criteria, product scopes, and classifications such as Harmonised System (HS) subcodes. Additional alignment with frameworks like the Basel Convention can further ensure that export and import flows are consistent with countries' resource management capacities.

The opportunity now lies in designing EPR systems that are equitable, enforceable, and aligned with the broader circular economy agenda. Given the wide range of EPR experience across the G20, particularly regarding product groups and socio-economic contexts, there is strong potential for peer learning, exchange of best practices, and capacity building. In addition, improved alignment across the G20 could strengthen national EPR systems and reduce implementation costs for firms.

5 PROPOSED G20 PRESIDENCY RECOMMENDATIONS AND CONSIDERATIONS

G20 members have a pivotal role to play in advancing the transition to a circular economy. In doing so, they can foster a more innovative, resilient, and resource-efficient economy, one that operates within planetary boundaries, supports climate and biodiversity goals, and delivers benefits for both people and business.

To raise policy ambition, accelerate upstream innovation, and strengthen global coordination, the following recommendations are proposed, recognising that effective action will require aligned efforts at both domestic and international levels: [9]

5.1 Foster Collaborative Action Amongst public and Private Actors for a Global Circular Economy

- **Strengthen international policy coherence and alignment through multilateral platforms**, such as the G20 ECSWG and RED, UN SDGs, UNEA, United Nations Framework Convention on Climate Change (UNFCCC) COP, CBD COP, Basel, Rotterdam and Stockholm Conventions (BRS COP), the Intergovernmental Negotiating Committee (INC) for a global plastics treaty, Global Alliance on Circular Economy and Resource Efficiency (GACERE), ACEA, and the Latin America and the Caribbean Circular Economy Coalition. Continued engagement through these forums is essential to foster greater alignment around circular economy principles and approaches, policy language and commitments, implementation pathways to strengthen the momentum for action, and coordination across schemes.
- **Focus policy action on high-impact waste streams and sectors**, such as packaging and plastics, consumer goods (including fashion and textiles and electronics), food and agriculture, and the built environment, to reduce waste, emissions, and environmental degradation, and catalyse innovation and opportunity. This includes adopting policy packages that include product design requirements, market incentives, and investments in circular business models, measurement and monitoring systems, and innovation and infrastructure. EPR schemes can serve as a key delivery mechanism.
- **Strengthen innovation systems that enable circular solutions** by embedding circularity in national innovation strategies, industrial policy, and digital agendas. G20 members can foster knowledge exchange, public–private partnerships, and investment in circular research, development, and innovation.
- **Align financial systems with circular economy goals** to scale investment and innovation in circular economy opportunities. G20 members could explore fiscal measures that reflect the environmental costs of virgin resource use, alongside tools such as sustainable public procurement and blended finance to de-risk circular investments and strengthen market signals.

[9] These recommendations are intended to inform G20 members and their applicability may vary depending on national contexts, priorities, and capacities.

- **Support inclusive capacity-building and institutional cooperation** to enable a just and inclusive circular transition. G20 members can draw on informal sector expertise, create support programmes for SMEs, and promote skills development programmes to support worker upskilling and transition, especially among disadvantaged and underrepresented groups, including women and youth. A multistakeholder and multi-level government approach — including national, regional, and local authorities — will be essential to strengthen implementation and avoid policy fragmentation.

To catalyse EPR as a key policy enabler within the broader circular economy transition, the following recommendations are proposed:

5.2 Enhance the Role of EPR within a Broader Circular Economy Policy Mix

- **Promote shared design principles for effective EPR systems**, including mandatory fee-based models, eco-modulated fees, clear performance targets, transparent governance structures, in particular that of PROs, and enforcement mechanisms. These principles can support innovation and mobilise private and blended capital needed for circular infrastructure.
- **Embed inclusivity and local context into EPR implementation** to ensure that EPR systems contribute to inclusive outcomes. G20 members can consider mechanisms that recognise the role of informal workers, SMEs, and community actors, and support multi-stakeholder design approaches.
- **Enhance global material traceability and transboundary cooperation,** working together to explore opportunities for improved traceability and transboundary cooperation to ensure the effective management of resources across jurisdictional borders. G20 members can consider investing in digital systems, shared tracking protocols, and data infrastructure to support accountability and improve system performance.

6 CONCLUSION

Accelerating the transition to the circular economy is both urgent and full of opportunities. The G20 can shape global trajectories through ambitious, coordinated policy action to deliver circular economies that help meet climate, biodiversity, and SDG targets.

EPR systems designed to drive upstream circularity, not just downstream waste management and recycling, can be a key enabler, and whilst there may be implementation challenges, these are surmountable with the right mix of fiscal, regulatory, and institutional tools.

A global transition to a circular and resilient economy requires leadership, long-term commitment, and cross-sector partnerships. Best practice examples of circular economy implementation across the world, particularly in developing nations, highlight the need to align approaches with local market systems and realities. This includes acknowledging the role of informal actors, addressing trade and customs enforcement gaps, and prioritising investment where it can be most effective. Governments, businesses, civil society, and international institutions will need to collaborate to harmonise approaches, recognising the need to adapt to local contexts as necessary, scale investment, and ensure inclusive participation.

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8 LIST OF ACRONYMS

ACEA: African Circular Economy Alliance

ACEF: African Circular Economy Facility

ACEN: Circular Economy Africa

AfDB: African Development Bank

AfCFTA: African Continental Free Trade Area

AI: Artificial Intelligence

AMCEN: African Ministerial Conference on the Environment

BRS COP: Basel, Rotterdam and Stockholm Conventions

CBD: Convention on Biological Diversity

CEI: Circular Electronics Initiative

CEN: Circularity Exchange Network

CEP: Circular Electronics Partnership

COP: Conference of the Parties

CSA: Circular South Africa

CSIR: Council for Scientific and Industrial Research

DFFE: Department of Forestry, Fisheries and the Environment

DSTI: Department of Science, Technology and Innovation

ECESP: European Circular Economy Stakeholder Platform

ECSWG: Environment and Climate Sustainability Working Group

EESC: European Economic and Social Committee

EIB: European Investment Bank

EPR: Extended Producer Responsibility

EUR: Euro

FIT: Farmer's Intelligence Toolkit

G20: Group of Twenty

GACERE: Global Alliance on Circular Economy and Resource Efficiency

GAP for EPR: Global Action Partnership for Extended Producer Responsibility

GDP: Gross Domestic Product

GGGI: Global Green Growth Institute

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit

INC: Intergovernmental Negotiating Committee

IoT: Internet of Things

MDBs: Multinational Development Banks

NCAF: National Circularity Assessment Framework

OECD: Organisation for Economic Co-operation and Development

PACE: Platform for Accelerating the Circular Economy

PACE II: Partnership for Action on Challenges relating to E-waste

PRO: Producer Responsibility Organisation

R&D: Research and Development

RED: Resource Efficiency Dialogue

REMA: Rwanda Environment Management Authority

RIWG: Research and Innovation Working Group

SECO: Swiss State Secretariat for Economic Affairs

SDG: Sustainable Development Goals

SME: Small and Medium Enterprises

SRI: Sustainable Recycling Industries

UNEA: United Nations Environment Assembly

UNECE: United Nations Economic Commission for Europe

UNEP: United Nations Environment Programme

UNEP FI: United Nations Environment Programme Finance Initiative

UNFCCC: United Nations Framework Convention on Climate Change

UNIDO: United Nations Industrial Development Organization

UNOPS: United Nations Office for Project Services

WBCSD: World Business Council for Sustainable Development

WCEF: World Circular Economy Forum

WEF: World Economic Forum

WIEGO: Women in Informal Employment Globalizing & Organizing

9 REFERENCES

ACEA (n.d.) *About ACEA*, *About ACEA | ACEA Africa*. Available at: www.aceaafrica.org/about-acea (Accessed: 19 May 2025).

AfCFTA (2024) *Home - AfCFTA*. Available at: https://au-afcfta.org/ (Accessed: 20 June 2025).

AfDB (2025) *Africa Circular Economy Facility: Bolstering Africa's Transformation in 2025*, *African Development Bank Group*. African Development Bank Group. Available at: www.afdb.org/en/news-and-events/africa-circular-economy-facility-bolstering-africas-transformation-2025-81819 (Accessed: 22 May 2025).

African Union (2025) Continental Circular Economy Action Plan for Africa (2024-2034). Available at: https://au.int/sites/default/files/documents/45336-doc-GIZ-AU_Continental_Circular_Action_V11.pdf (Accessed: 12 September 2025).

Attafuah-Wadee, K. and Tilkanen, J. (2020) *Policy Approaches for Accelerating the Circular Economy in Africa*, *circulareconomy.earth | Chatham House*. Available at: https://circulareconomy.earth/publications/accelerating-the-circular-economy-transition-in-africa-policy-challenges-and-opportunities (Accessed: 21 May 2025).

Bakshi, S.K., Bhattacharjya, S. and Meidl, R.A. (2020) *A G20 Circular Carbon Economy: Policies and Practices to Foster Circularity in Plastics. Task Force 2. Climate Change*

and Environment. Riyadh: T20 Saudi Arabia 2020. Available at: https://www.global-solutions-initiative.org/wp-content/uploads/2025/03/T20_TF2_PB14.pdf (Accessed: 19 June 2025).

Barteková, E. and Börkey, P. (2022) *Digitalisation for the transition to a resource efficient and circular economy*. Working Paper 192. Paris: OECD. Available at: https://doi.org/10.1787/6f6d18e7-en (Accessed: 5 June 2025).

Basel Convention (2019) *Technical guidelines on the environmentally sound management of plastic wastes: Addendum – Revised draft practical manuals on extended producer responsibility and financing systems for environmentally sound management*. Available at: https://www.basel.int/Implementation/Plasticwaste/Guidance/tabid/8333/ctl/Download/mid/23092/Default.aspx?id=48&ObjID=21132 (Accessed: 28 August 2025).

Basel Convention (n.d) *Terms of reference for the Partnership for Action on Challenges relating to E-waste (PACE II)*. Available at: https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-Partnerships-PACEII-TOR-COP15-2022.English.pdf (Accessed: 28 August 2025).

Bocconi University, Ellen MacArthur Foundation, and Intesa Sanpaolo (2021) *The circular economy as a de-risking strategy and driver of superior risk-adjusted returns*. Available at: www.ellenmacarthurfoundation.org/the-circular-economy-as-a-de-risking-strategy-and-driver-of-superior-risk.

Brown, A. and Börkey, P. (2024) *Extended producer responsibility in the garments sector*. 253. Paris: OECD Publishing. Available at: https://doi.org/10.1787/8ee5adb2-en (Accessed: 28 May 2025).

Brown, A., Laubinger, F. and Börkey, P. (2023) *New Aspects of EPR: Extending producer responsibility to additional product groups and challenges throughout the product lifecycle*. OECD Environment Working Papers 225. Paris: OECD Publishing. Available at: https://doi.org/10.1787/cfdc1bdc-en.

CEP (2024) 'The Circular Electronics Roadmap - CEP | Circular Electronics Partnership', 27 March. Available at: https://cep2030.org/the-circular-electronics-roadmap/, https://cep2030.org/the-circular-electronics-roadmap/ (Accessed: 23 May 2025).

Chatham House and UNIDO (2024) *National Circular Economy Roadmaps: A Global Stocktake for 2024*. Vienna. Available at: www.unido.org/sites/default/files/unido-publications/2024-05/UNIDO_National%20circular%20economy%20roadmaps_v07.pdf.

Circle Economy (2020) *Jobs & Skills in the circular economy: State of play and future pathways*. Available at: www.circle-economy.com/resources/jobs-skills-in-the-circular-economy-state-of-play-and-future-pathways.

Circle Economy (2025) *Finance - Initiatives - Circularity Exchange Network (CEN)*. Available at: www.circle-economy.com/programmes/finance/initiatives (Accessed: 23 May 2025).

Circle Economy and Dutch Ministry of Infrastructure and Water Management (2022) *Unlocking the potential of international financial institutions in the circular economy transition*. Available at: https://cdn.prod.website-files.com/5d26d80e8836af2d12ed1269/6374b7e8b2abd9991aa76a8a_International%20Financial%20Institutions%20in%20the%20Circular%20Economy%20Transition-%20A%20high%20level%20roadmap.pdf.

Circular South Africa (n.d.) *Home - Circular South Africa*, *Circular South Africa*. Available at: www.circularsouthafrica.co.za (Accessed: 17 June 2025).

CSIR (n.d.) *Circular Economy STI Strategy*, *Circular Economy STI Strategy - Circular Economy*. Available at: www.circulareconomy.co.za/about/ce-sti-strategy/ (Accessed: 22 May 2025).

DFFE, Republic of South Africa (2020) *National Waste Management Strategy 2020*. Department of Forestry, Fisheries and the Environment (DFFE), Republic of South Africa. Available at: www.dffe.gov.za/sites/default/files/docs/nationalwaste_management_strategy.pdf (Accessed: 22 May 2025).

DFFE, Republic of South Africa (2024) 'BID NUMBER: DFFE-T014 (24/25): The appointment of a service provider to develop a National Circular Economy Action Plan within twenty-four (24) months'. Available at: www.dffe.gov.za/sites/default/files/tenders/dffet014.24.25_circulareconomyactionplan.pdf (Accessed: 17 May 2025).

EESC (2023) *Europe's Circular Economy and its Pact for Skills: working together for an inclusive and job-rich transition?* Available at: www.eesc.europa.eu/en/our-work/publications-other-work/publications/europes-circular-economy-and-its-pact-skills-working-together-inclusive-and-job-rich-transition (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2018) *Circular Consumer Electronics: An initial exploration*. Available at: www.ellenmacarthurfoundation.org/circular-consumer-electronics-an-initial-exploration (Accessed: 23 May 2025).

Ellen MacArthur Foundation (2019a) '5 CORE CAPABILITIES TO EFFECT CHANGE'.

Ellen MacArthur Foundation (2019b) *The circular economy opportunity for urban and industrial innovation in China*. Available at: www.ellenmacarthurfoundation.org/urban-and-industrial-innovation-in-china (Accessed: 23 May 2025).

Ellen MacArthur Foundation (2021a) *Circular Business Models: redefining growth for a thriving fashion industry*. Available at: www.ellenmacarthurfoundation.org/fashion-business-models/overview (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2021b) *Cooling as a service: Kaer*, *Cooling as a service: Kaer*. Available at: www.ellenmacarthurfoundation.org/circular-examples/cooling-as-a-service-kaer (Accessed: 23 May 2025).

Ellen MacArthur Foundation (2021c) *The big food redesign: Regenerating nature with the circular economy*. Available at: www.ellenmacarthurfoundation.org/resources/food-redesign/overview (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2021d) *The circular economy glossary*. Ellen MacArthur Foundation. Available at: www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/glossary (Accessed: 17 June 2025).

Ellen MacArthur Foundation (2021e) *Universal circular economy policy goals. Enabling the transition to scale.* Available at: www.ellenmacarthurfoundation.org/universal-policy-goals/overview (Accessed: 9 May 2025).

Ellen MacArthur Foundation (2022a) *Digital Technology as an Enabler of a Circular Economy: Part 1 – More than just a big idea – how extended reality tech can enable a circular economy*, *Ellen MacArthur Foundation*. Available at: www.ellenmacarthurfoundation.org/tech-enablers-series/part-1 (Accessed: 9 May 2025).

Ellen MacArthur Foundation (2022b) *Digital Technology as an Enabler of a Circular Economy: Part 2 – Blockchain can facilitate the transition to a circular economy – but scaling its use is a work in progress*, *Ellen MacArthur Foundation*. Available at: www.ellenmacarthurfoundation.org/tech-enablers-series/part-2 (Accessed: 9 May 2025).

Ellen MacArthur Foundation (2022c) *Digital Technology as an Enabler of a Circular Economy: Part 3 – Success in managing complexity: the role of the Internet of Things in creating a circular economy*, *Ellen MacArthur Foundation*. Available at: www.ellenmacarthurfoundation.org/tech-enablers-series/part-3 (Accessed: 9 May 2025).

Ellen MacArthur Foundation (2022d) *Perspective on 'Breaking the Plastic Wave' study: The circular economy solution to plastic pollution*. Available at: www.ellenmacarthurfoundation.org/perspective-on-breaking-the-plastic-wave-study (Accessed: 20 May 2025).

Ellen MacArthur Foundation (2023a) *Making the most of materials: Africa's skills in repair and repurposing point the way for the Global North*. Available at: www.ellenmacarthurfoundation.org/articles/making-the-most-of-materials (Accessed: 16 May 2025).

Ellen MacArthur Foundation (2023b) *Our vision of a circular economy for fashion*. Available at: www.ellenmacarthurfoundation.org/our-vision-of-a-circular-economy-for-fashion (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2023c) *The Global Commitment*. Available at: www.ellenmacarthurfoundation.org/global-commitment/overview (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2024a) *A UN treaty to end plastic pollution*. Available at: www.ellenmacarthurfoundation.org/un-plastics-treaty/overview (Accessed: 14 May 2025).

Ellen MacArthur Foundation (2024b) *Building Prosperity: Unlocking the potential of a nature-positive, circular economy for Europe*. Available at: www.ellenmacarthurfoundation.org/building-prosperity (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2024c) *Pushing the boundaries of EPR policy for textiles*. Available at: www.ellenmacarthurfoundation.org/epr-policy-for-textiles (Accessed: 9 May 2025).

Ellen MacArthur Foundation (2025a) *Building Prosperity: briefing for policymakers*. Available at: www.ellenmacarthurfoundation.org/building-prosperity-briefing-for-policymakers (Accessed: 15 May 2025).

Ellen MacArthur Foundation (2025b) 'Insights from the Ellen MacArthur Foundation's Policy & Institutions programme: Circular economy policy frameworks in the G20'.

Ellen MacArthur Foundation *et al.* (2025) 'World Circular Economy Forum 2025: A Call to Centre Inclusivity & Perspectives from the Global South'. Available at: https://www.wiego.org/advocacy-worker-education-resources/world-circular-economy-forum-2025-statement/ (Accessed: 26 June 2025).

European Commission (2019) *Augmented reality helps improve agricultural productivity*, *Augmented reality helps improve agricultural productivity*. Available at:

https://cordis.europa.eu/article/id/411484-augmented-reality-helps-improve-agricultural-productivity (Accessed: 23 May 2025).

European Investment Bank (2025) *Circular economy: Boosting competitiveness, sustainability and strategic autonomy*. Available at: www.eib.org/en/projects/topics/energy-natural-resources/circular-economy/index (Accessed: 15 May 2025).

G20 Brazil (2024) *Waste and Circular Economy (W&CE). Advancing a global agenda towards an inclusive circular economy*. Available at: https://g20re.org/pdf/202503/ECSWG_Waste_and_Circular_Economy_W_CE.pdf.

G20 Germany (2017) *Annex to G20 Leaders Declaration - G20 Resource Efficiency Dialogue*. Hamburg, Germany. Available at: https://g20re.org/about.html.

G20 India (2023) *G20 ECSWG Knowledge Exchange on EPR for Circular Economy*.

G20 South Africa (2024) *G20 South Africa 2025 Sherpa Track Issue Note - Environment and Climate Sustainability Working Group*.

GAP for EPR (2025) *Global Action Partnership for EPR - Home*, *Global Action Partnership for EPR*. Available at: https://gap-epr.prevent-waste.net/ (Accessed: 23 May 2025).

GGGI (2025) *The Carbon Transaction Facility (CTF) Brochure*. Global Green Growth Institute. Available at: https://gggi.org/report/ctf-brochure/ (Accessed: 15 June 2025).

GIZ (2023) *Extended Producer Responsibility schemes in Small Island Developing States*. Available at: www.giz.de/de/downloads/giz2023-en-EPR-schemes-in-SIDS.pdf (Accessed: 16 May 2025).

International Resource Panel (2025) *Global Materials Stewardship - Join the IRP Co-Chairs in Calling for 21st Century Global Materials Stewardship*, *Global Materials Stewardship*. Available at: www.globalmaterials.earth (Accessed: 19 June 2025).

Laubinger, F. *et al.* (2021) *Modulated fees for Extended Producer Responsibility schemes (EPR)*. 184. Paris: OECD Publishing. Available at: https://doi.org/10.1787/2a42f54b-en (Accessed: 27 May 2025).

MacArthur, E. (2019) 'A positive way out'. Available at: www.sustainablegoals.org.uk/wp-content/uploads/2019/06/092-093-SDGs-MACARTHUR.pdf (Accessed: 28 May 2025).

Munro, B. *et al.* (2022) *Landscaping the Repair and Reuse Economy in Kenya*. Better Futures CoLab. Available at: https://static1.squarespace.com/static/61a3a8ee0e9c1028ed45fdfc/t/6256ae4fd81

7b2407bd1efc2/1649847917396/Landscaping+the+Repair+and+Reuse+Economy+in+Kenya+-+Final+Report_March+2022.pdf.

Nestlé Global (2019) *Nestlé breaks new ground with open blockchain pilot | Nestlé Global*. Available at: www.nestle.com/media/pressreleases/allpressreleases/nestle-open-blockchain-pilot (Accessed: 29 May 2025).

Nestlé Nespresso (n.d.) *Nespresso and OpenSC reveal new technology to bring new levels of transparency to coffee supply chain | Nestlé Nespresso*. Available at: https://nestle-nespresso.com/news/new-levels-transparency-coffee-supply-chain (Accessed: 29 May 2025).

OECD (2016) *Extended Producer Responsibility: Updated Guidance for Efficient Waste Management*. Paris: OECD Publishing. Available at: https://doi.org/10.1787/9789264256385-en (Accessed: 27 May 2025).

OECD (2021) *Towards a more resource-efficient and circular economy. The role of the G20*. Available at: www.oecd.org/content/dam/oecd/en/topics/policy-issues/resource-efficiency-and-circular-economy/OECD-G20-Towards-a-more-Resource-Efficient-and-Circular-Economy.pdf (Accessed: 28 May 2025).

OECD (2024a) *Policy coherence for sustainable development*, *OECD*. Available at: www.oecd.org/en/topics/policy-coherence-for-sustainable-development.html (Accessed: 13 June 2025).

OECD (2024b) *Policy Scenarios for Eliminating Plastic Pollution by 2040*. Paris: OECD Publishing. Available at: https://doi.org/10.1787/76400890-en (Accessed: 28 May 2025).

OECD (2025) *OECD and G20*, *OECD*. Available at: www.oecd.org/en/about/oecd-and-g20.html (Accessed: 21 May 2025).

Okoya, S.A. *et al.* (2023) 'Enhancing Decentralised Recycling Solutions with Digital Technologies', in Oyinlola, M. and Kolade, O., *Digital Innovations for a Circular Plastic Economy in Africa*. 1st edn. London: Routledge, pp. 208–221. Available at: https://doi.org/10.4324/9781003278443-16.

One Planet Network (2024) *National Circularity Assessment Framework for Buildings*, *One Planet Network*. Available at: www.oneplanetnetwork.org/programmes/circular-built-environment/National-Circularity-Assessment-Framework (Accessed: 19 June 2025).

PACE (2021) *Electronics*, *PACE*. Available at: www.pacecircular.org/action-agenda/electronics (Accessed: 23 May 2025).

PACE (2025) *PACE Purpose Statement*, *PACE*. Available at: www.pacecircular.org/purpose_statement (Accessed: 15 May 2025).

PREVENT Waste Alliance (2025) 'PREVENT EPR SWG meeting: EPR in South Africa: Legal Insights and Social Inclusion', 9 May.

PREVENT Waste Alliance (n.d.) *EPR Toolbox*, *Prevent Waste Alliance*. Available at: www.prevent-waste.net/epr-toolbox/ (Accessed: 27 May 2025).

Rademaekers, K. *et al.* (2020) *Circular Economy in Africa-EU cooperation - Continental Report*. Luxembourg: Trinomics B.V., Tomorrow Matters Now Ltd., adelphi Consult GmbH, and Cambridge Econometrics Ltd., under EC Contract ENV.F.2./ETU/2018/004.

Republic of Rwanda, REMA and GGGI (2024) *A practical guide to understanding carbon markets under Article 6 of the Paris Agreement*. Available at: www.gggi.org/report/a-practical-guide-to-understanding-carbon-markets-under-article-6-of-the-paris-agreement/ (Accessed: 18 June 2025).

Roland Berger (2023) *Building Strategic Resilience: Future Skills for the Circular Economy and Waste Management*, *Roland Berger*. Available at: https://www.rolandberger.com/en/Insights/Publications/Building-strategic-resilience-Future-skills-for-the-circular-economy-and-waste.html (Accessed: 15 May 2025).

Schröder, P. and Barrie, J. (2024) *How the circular economy can revive the Sustainable Development Goals*. Chatham House. Available at: www.chathamhouse.org/2024/09/how-circular-economy-can-revive-sustainable-development-goals (Accessed: 17 June 2025).

Sitra (2023) 'The impact of the circular economy on jobs and skills', *Sitra*, 17 January. Available at: www.sitra.fi/en/publications/the-impact-of-the-circular-economy-on-jobs-and-skills/ (Accessed: 16 May 2025).

SRI (n.d.) 'The inception of SRI', *Sustainable Recycling Industries*. Available at: www.sustainable-recycling.org/about/ (Accessed: 17 June 2025).

The Times of India (2025) 'DoE approves vocational courses in 257 more govt schools', *The Times of India*, 26 May. Available at: https://timesofindia.indiatimes.com/city/delhi/doe-approves-vocational-courses-in-257-more-govt-schools/articleshow/121415698.cms (Accessed: 29 May 2025).

UN (2024) *The Sustainable Development Goals Report 2024*. New York: United Nations Publications. Available at: https://unstats.un.org/sdgs/report/2024/ (Accessed: 9 May 2025).

UNECE (2022) *Mobilizing Financing for the Circular Economy*. Available at: https://unece.org/sites/default/files/2023-04/CIRCULAR-STEP%20Mobilizing%20Financing-%204.28.2023_0.pdf (Accessed: 15 May 2025).

UNEP (2017) *As buildings and construction sector grows, time running out to cut energy use and meet Paris climate goals*. Available at: www.unep.org/news-and-stories/press-release/buildings-and-construction-sector-grows-time-running-out-cut-energy (Accessed: 23 May 2025).

UNEP (2020) *Progress in the implementation of resolution 4/1 on innovative pathways to achieve sustainable consumption and production: Report of the Executive Director*. UNEP. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/34684/K2002486-E.pdf?sequence=1&isAllowed=y.

UNEP (2024) *Global Resources Outlook 2024: Bend the Trend – Pathways to a liveable planet as resource use spikes*. International Resource Panel. Nairobi. Available at: https://wedocs.unep.org/20.500.11822/44901 (Accessed: 12 September 2025).

UNEP (2024) *Ministerial Meeting on Circular Economy*, *UNEP*. Available at: https://www.unep.org/events/unep-event/ministerial-meeting-circular-economy (Accessed: 26 June 2025).

UNEP and AMCEN (2019) *Report of the Ministerial Segment - African Ministerial Conference on the Environment, Seventeenth session*. AMCEN/17/9. Durban: African Ministerial Conference on the Environment, p. 17. Available at: https://wedocs.unep.org/20.500.11822/30786 (Accessed: 20 May 2025).

UNEP and AMCEN (2021) *Report of the Ministerial Segment of the Resumed Eighteenth Session - African Ministerial Conference on the Environment: Eighteenth session*. AMCEN/18(I)/8. African Ministerial Conference on the Environment, p. 27. Available at: https://wedocs.unep.org/20.500.11822/37587 (Accessed: 20 May 2025).

UNEP and AMCEN (2022) *Report of the Ministerial Segment of the Resumed Eighteenth Session - African Ministerial Conference on the Environment: Eighteenth session*. AMCEN/18(II)/15. Dakar: African Ministerial Conference on the Environment, p. 39. Available at: https://wedocs.unep.org/20.500.11822/41324 (Accessed: 20 May 2025).

UNEP FI (2020) *Financing Circularity: Demystifying Finance for Circular Economies*. Available at: www.unepfi.org/publications/financing-circularity/ (Accessed: 15 May 2025).

UNEP FI (2025) *United Nations Environment Programme Finance Initiative*, *UNEP FI*. Available at: www.unepfi.org (Accessed: 15 May 2025).

UNFCCC (2023) *Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on its fifth session, held in the United Arab Emirates from 30 November to 13 December 2023*. UNFCCC, p. 36. Available at: https://unfccc.int/sites/default/files/resource/cma2023_16a01E.pdf (Accessed: 13 June 2025).

UNITAR (2024) *The Global E-waste Monitor 2024*. Available at: https://ewastemonitor.info/the-global-e-waste-monitor-2024/ (Accessed: 26 June 2025).

WBCSD (n.d.) *Global Circularity Protocol*. Available at: https://www.wbcsd.org/actions/global-circularity-protocol/ (Accessed: 12 September 2025).

WIEGO (2022) *Extended Producer Responsibility (EPR) and Waste Pickers*. Available at: www.wiego.org/wp-content/uploads/2022/07/technical-brief-no-15.pdf (Accessed: 16 May 2025).

World Bank (2022). The Role of EPR Schemes for Packaging toward Circular Economies in APEC. Available at: https://documents1.worldbank.org/curated/en/099640003102239957/pdf/P1709940b3dbd3092083b208e60bcd5719a.pdf (Accessed: 28 August 2025).

World Bank (2023). Combating the Plastic Waste Crisis in the Philippines: Implementing Extended Producer Responsibility with Lessons Learned from Korea. Available at: https://documents1.worldbank.org/curated/en/099201003082324515/pdf/P177183036b0c904c08b1a0526fcb062538.pdf (Accessed: 28 August 2025).

World Bank (2024). Extended Producer Responsibility for Advancing Circular Economies for Plastics in Bangladesh. Available at: https://documents1.worldbank.org/curated/en/099121624201515863/pdf/P1759081d4a8d30e81899a1c0b8bfb342ad.pdf (Accessed: 28 August 2025).

World Circular Economy Forum (2025) 'Developing essential skills for circularity', 14 May. Available at: https://wcef2025.com/session/developing-essential-skills-for-circularity/ (Accessed: 23 May 2025).

World Economic Forum (2020) *Transforming African economies to sustainable circular models*, *Transforming African economies to sustainable circular models | World Economic Forum*. Available at: www.weforum.org/impact/the-african-circular-economy-alliance-impact-story/ (Accessed: 21 May 2025).

World Economic Forum (2021) *Five Big Bets for the Circular Economy in Africa*. Geneva: World Economic Forum. Available at: www.weforum.org/publications/five-big-bets-for-the-circular-economy-in-africa-african-circular-economy-alliance (Accessed: 22 May 2025).