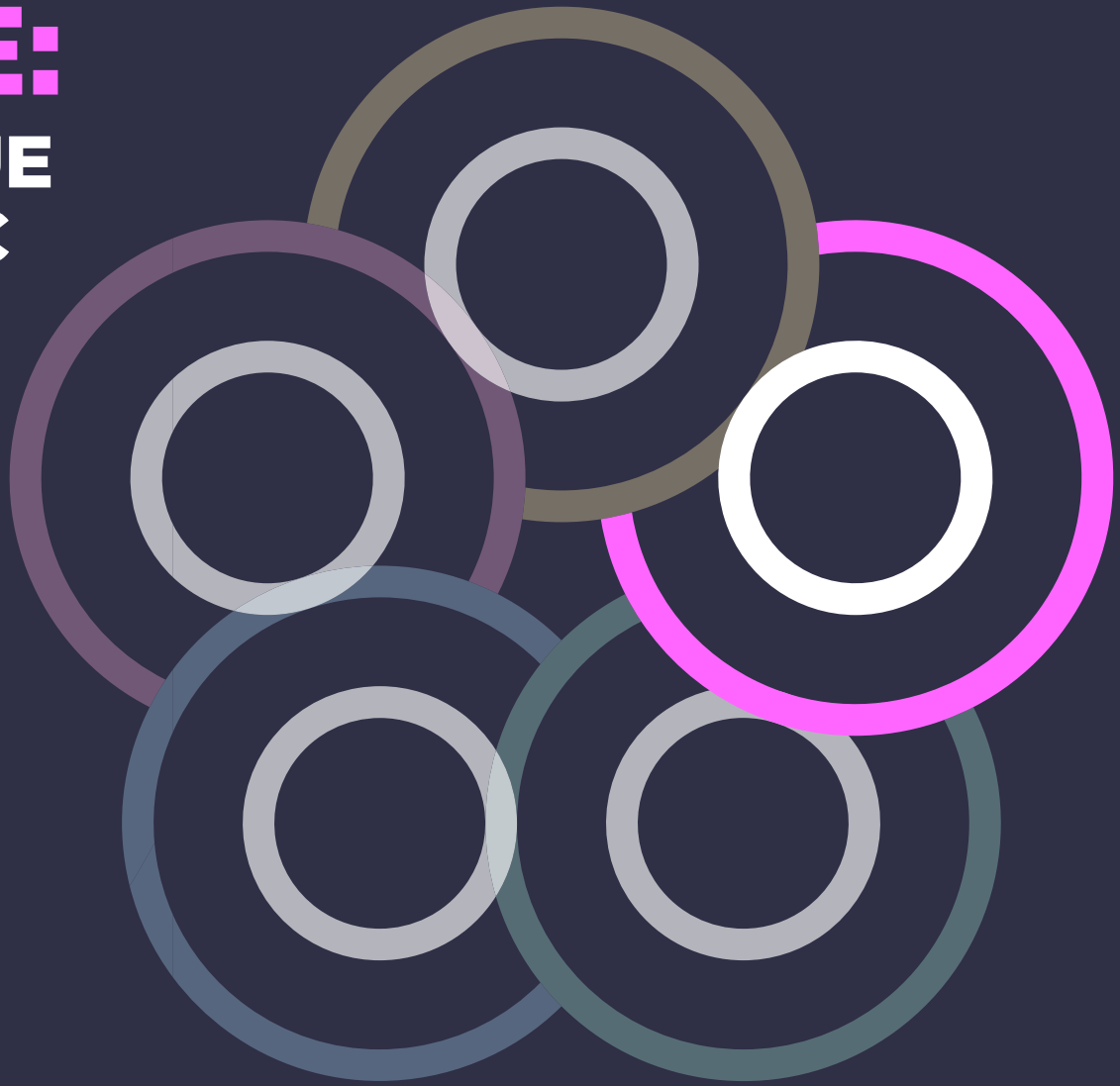
POLICY INSTRUMENTS FOR A RESILIENT AND COMPETITIVE CIRCULAR ECONOMY

ELLEN MACARTHUR FOUNDATION

KEEP IT IN USE:

RETAIN RESOURCE VALUE AND UNLOCK ECONOMIC OPPORTUNITIES



ELLEN MACARTHUR FOUNDATION

THIS IS THE FIRST POLICY BRIEF IN A SERIES DESIGNED TO SUPPORT GOVERNMENTS IN ACCELERATING THE CIRCULAR ECONOMY TRANSITION

Building on the Ellen Macarthur Foundation's Universal Circular Economy Policy Goals, the series provides a shortlist of actionable policy instruments that can unlock circular economy outcomes.

They not only have international relevance and clear momentum in policy development, but they can also be adapted to the diverse needs of national, regional, and local contexts. The series will illuminate key design principles for selected policy instruments, supply case studies and policy options to inspire action, and offer policy recommendations for accelerating the transition to a circular economy.

Contents

Key insights

Keeping products, parts, and materials in use at their highest value is one of the main principles of the circular economy.

Promoting product design, business models, and incentives that favour reuse, repair, and remanufacturing — alongside regenerative practices such as cascading, composting, and returning nutrients to the soil — help to maintain both technical and biological products and resources at their highest value.

Three instruments stand out as particularly transformative for keeping materials and resources at their highest value in the economy:

- **Waste regulations and resource classifications establish the legal foundations for circularity.** Precise and adaptable definitions and categories for products, by-products, secondary materials, compostables, biological residues, and waste — that specify quality and safety requirements — enable resources to follow appropriate recovery pathways. Coordinated policies across jurisdictions, coupled with strong enforcement capacity and closed loopholes, simplify compliance and unlock opportunities for the circulation of products, parts, and materials.
- **Extended Producer Responsibility (EPR) is currently the only policy instrument that creates dedicated, ongoing, and sufficient funding to cover the net cost associated with managing products after use.** Mandatory, fee-based EPR schemes ensure stable funding and — when supported by eco-modulated fees — incentivise circular product design. Clear performance targets, robust enforcement, and inclusive stakeholder engagement prevent free-riding and support socially equitable outcomes.
- **Mechanisms that support secondary materials markets strengthen demand.** Such demand signals include quality standards, reliable market data, pricing signals — like taxes on virgin materials and subsidies for secondary materials — and investing in infrastructure, such as controlled biological treatment facilities for nutrient recovery and biorefineries for valorising bio-based resources and industrial composting. Coherent governance can increase investor confidence, reduce market volatility, and encourage the use of recovered materials.

Policy coherence and coordination are essential to maximise impact.

Accelerating the circular economy requires embedding circular principles across the broader policy landscape, including climate, nature, and social policies. Coherence can be achieved by integrating circular economy impact assessments into government budgets and establishing coordination mechanisms — such as national councils or interministerial committees — to align actions and ensure environmental and social benefits are realised in full.

Implementation should be adapted to national and local contexts.

While the policies shared in this brief are globally relevant, their effective application depends on local conditions. Tailoring policies to national capacities, economic structures, and social priorities ensures they are equitable and feasible. Framing policies around resource efficiency and economic opportunity can also help build support in contexts where climate narratives face political resistance.

Introduction to the series: Policy instruments for a resilient and competitive circular economy

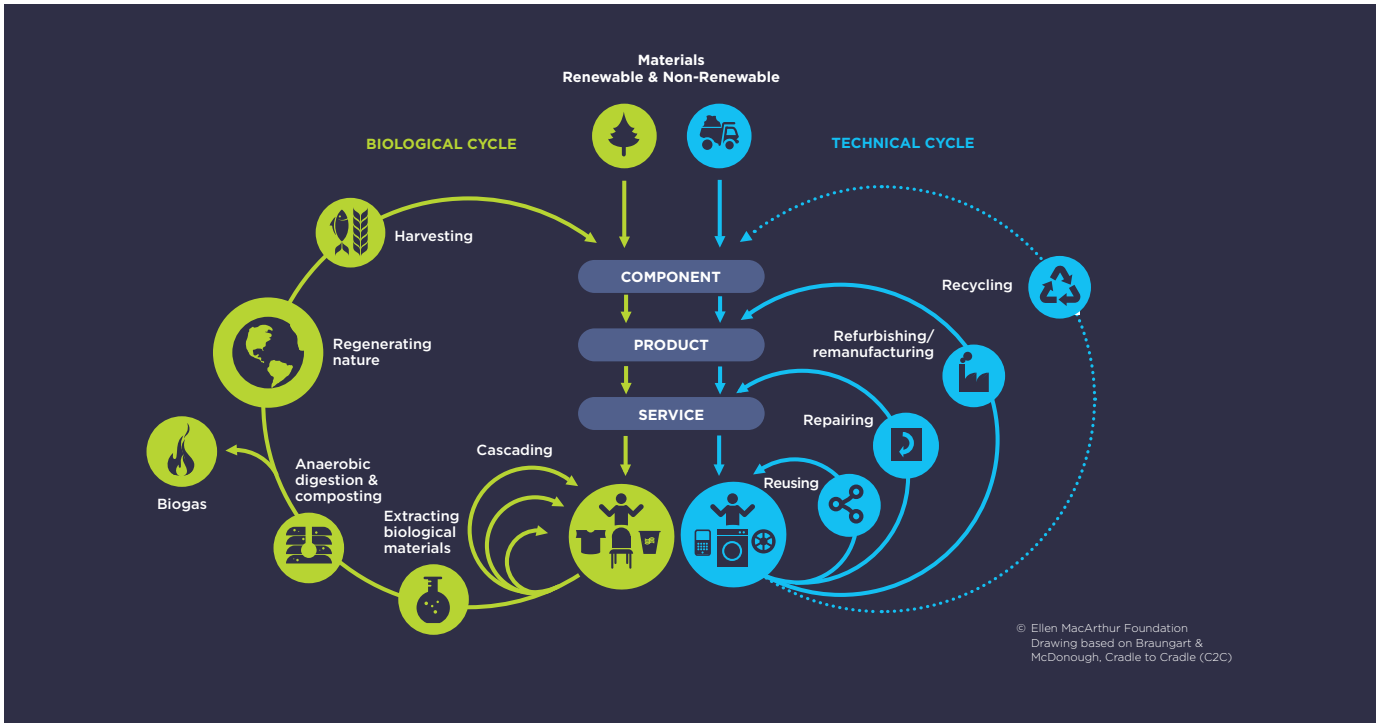
Our current economy is depleting resources, destroying value, and driving environmental harm at an unsustainable pace. Each year, the global economy consumes around 100 billion tonnes of resources,[1] three quarters of which are non-renewable.[2] Relying on a continuous flow of virgin raw materials increases the exposure to price volatility and supply chain disruption, while wasteful resource use undermines overall economic efficiency. If current trends continue, resource extraction could increase by 150% by 2060,[3] eroding economic resilience and compounding the triple planetary crisis of climate change, pollution, and biodiversity loss.

Government policymakers can play a decisive role in addressing these challenges by developing policy mixes that accelerate the circular economy transition, delivering not only economic gains but also environmental and social benefits.[4] While voluntary business initiatives can foster change, policy is essential to enshrining and delivering it at a systemic level. The transition from current policy approaches — which reinforce a system driven by cost structures and incentives that favour sales volume — to one underpinned by the circular economy will enable governments to create a more resilient, socially inclusive, and equitable system that eliminates waste, keeps products and materials in use, and regenerates nature by design.

Policies for keeping products, parts, and materials in use

Developing policies aimed at keeping products, parts, and materials in use entails implementing circular business models, systems, and incentives that maximise their value within the economy.

This means prioritising loops based on their potential to keep products and materials in use for as long as possible: from those with the highest potential, at the product and component levels, such as reuse, repair, and remanufacturing, to the lowest, at the material level, with recycling and composting. Such an approach — illustrated in the Ellen MacArthur Foundation's Butterfly Diagram — applies to both the biological and the technical cycles, and focuses on the ways value is retained, regenerated, or created throughout a product's or material's life cycle, instead of being lost as waste — often through landfilling or energy recovery.[5] This system of resource management, as opposed to current waste management, includes mechanisms such as product-as-a-service, take-back schemes, collection and sorting systems, and marketplaces for recovered materials — all fundamental to achieving circular outcomes.[6]



A wide range of policy instruments can be leveraged to keep products, parts, and materials in use for longer. These include but are not limited to:[7]

Deposit return schemes, which provide direct financial incentives for product return

Tax and procurement policies, which stimulate markets for circular products and services

Collection and sorting policies, essential to efficiently recover materials at scale

Legal requirements to inform about the availability of remanufactured parts

Composting and regenerative agriculture policies, which link urban composting and organic waste to agricultural uses

Spatial planning policies, which locate and integrate waste infrastructure, biorefineries, and composting systems

Policies that disincentivise landfilling and waste-to-energy to create the pressure needed to prioritise higher-value circular pathways.

A strategic trio of enabling instruments

Three instruments stand out as particularly transformative in enabling loops of value creation.

These instruments establish clear legal baselines, incentivise material loops, and secure demand for secondary materials, delivering economic and social gains, such as cost savings and job creation. They can also deliver environmental benefits, including addressing waste and pollution, climate change, and biodiversity loss.

When used together, they form a strategic package that creates supply and demand signals, ensuring that valuable resources are collected, processed, and reintegrated into the economy. This implementation can also stimulate product design and business model innovation while reducing waste and shifting reliance away from virgin resources.

1. **Waste regulations and resource classifications**
2. **Extended Producer Responsibility**
3. **Supporting secondary materials markets**

01

WASTE REGULATIONS AND RESOURCE CLASSIFICATIONS

Waste regulations and resource classifications

Waste regulations determine how resources are handled, while resource classifications define when they are considered waste. Once a product is classified as waste, strict rules for handling, transport, treatment, and disposal apply. Legal definitions set the pathway for discarded products, parts, and materials, determining whether they can be reused, repaired, remanufactured, recycled, composted, or must be disposed of. Though vital for protecting human health and the environment, these rules can unintentionally make circular pathways more complex or costly, and discourage reuse, recycling, or composting.[8] At the same time, well-designed regulations and consistent classifications can help distinguish genuine reuse exports from waste shipments, ensuring that products traded for reuse are functional and fit for purpose. This can enable responsible value capture through reuse exports while preventing the transfer of waste management burdens to importing countries that may lack the necessary infrastructure.[9]

Clear and consistent waste definitions underpin effective resource management and can unlock opportunities that support a system of circular resource flows. Harmonising and reviewing definitions in waste legislation, ensuring coherence across countries and international frameworks, such as the Basel, Rotterdam, and Stockholm Conventions, have the potential to divert valuable materials from disposal, promote resource efficiency, and support the transition to a circular economy.

By ensuring that materials remain resources for as long as possible before being classified as waste, **these policies can unlock major opportunities, including:**

Waste regulations and resource classifications

To realise these outcomes, resource classification and waste regulation policies need to be designed to ensure practical application is both feasible and effective. **Three key design principles demonstrate an outsized impact on how these policies work in practice:**

Key design principles

1

Create clarity around definitions. Definitions must be precise yet adaptable to technological change. End-of-waste criteria should specify quality and safety requirements for secondary materials, distinguish clearly between products, by-products, and waste — including bio-based materials, which require specific criteria to differentiate secondary resources from compostables and waste — and include mechanisms for regular review and update.[14]

2

Coordinate across jurisdictions. Differences in waste definitions across jurisdictions complicate compliance with and enforcement of environmental, trade, customs, and industry policies. Coordinating across ministries, with businesses and with civil society helps to align regulations, close loopholes, and strengthen enforcement, while allowing flexibility for local contexts.[15]

3

Build institutional capacity. Enforcement must ensure compliance while also enabling materials to remain resources for as long as possible without compromising environmental safeguards. This requires institutional capacity — trained staff, clear guidance, and adequate resources — to interpret and apply classifications consistently and confidently. Without such capacity, enforcement can become overly cautious, leading to materials prematurely being defined as waste and losing their economic value.[16] Institutional capacity also needs to include effective monitoring, data collection, and compliance systems. While developing these capacities can require significant investment, policy instruments such as EPR can help share this responsibility by engaging producers in these activities.

Waste regulations and resource classifications

Policies that classify and regulate resources and waste already exist in many countries, with governments focusing on establishing definitions and strengthening waste management systems to reduce overall solid waste. But significant gaps remain, particularly in aligning legislation at the international level. Without such alignment, the cross-border movement of secondary materials is limited, constraining the scalability of circular economy initiatives and the potential for coordinated global resource flows.[17] Two examples of resource classification and waste regulation from Canada and the European Union (EU)/Ireland present key lessons for governments.

Canada: Amending the Copyright Act to facilitate repair

Canada amended existing legislation to eliminate barriers to the right to repair. In 2024, Canada amended its Copyright Law and Competition Act through the Bills C-244,[18] C-294,[19] and C-59,[20] which removed many of the barriers to repair. These amendments enable both repair technicians and citizens to legally bypass copyright protections to diagnose, maintain, and repair products, or to enable interoperability between different devices and software.[21]

Multi-level coordination to examine the issue. The government's commitments regarding the right to repair involved broad engagement — including an online consultation and roundtable discussion — across government, business, and civil society.[22] The reforms to the Competition Act were announced in 2023, but the decision to do so came from earlier commitments, including the 2021 federal mandate to implement a right to repair, with bills C-244 and C-294 introduced in 2022.[23] Subnational governments are further pushing the ambition of these reforms: Québec has already implemented a ban on planned obsolescence as well as mandating access to repair information and tools, while other provinces are taking similar amendments into consideration.[24]

Legislative change needs supporting measures to secure impact. Alone, legislative amendments are not sufficient to guarantee implementation. Although technicians and consumers can now legally bypass software locks for the purpose of diagnosis, maintenance, and repair, it remains illegal to manufacture and distribute circumvention tools to do so.[25] The amendments to the Copyright Act do not place any obligations on manufacturers and small businesses, but they may face additional compliance costs linked to providing repair documentation, parts, and training to independent repairers as part of future right-to-repair measures. Data security and warranty protection are still concerns.[26]

Further complementary measures would be required. These include tackling planned obsolescence, developing a product durability index, and assessing whether additional federal legislative changes could better support the right to repair.[27] Other areas of consideration include the type of information needed to facilitate repair, the availability of downloadable schematics alongside replacement parts, and the interoperability of components — ensuring that non-proprietary parts are used where possible. It has also been suggested that continued software support should be provided for a reasonable period where appropriate.

Because consumer protection and warranties fall under provincial and territorial jurisdiction, many of these changes would need to be implemented at those levels of government.

Advancing the circular economy often depends on legislation that, at first glance, may seem unrelated to environmental policy. Legal frameworks governing competition, consumer protection, or intellectual property can significantly influence how products are designed, maintained, and circulated. Reviewing and adapting these frameworks is therefore crucial to removing hidden barriers to repair, reuse, and resource efficiency. Canada's recent reforms to its Copyright and Competition Acts show how such cross-sectoral policy updates can support practical circular outcomes.

Waste regulations and resource classifications

The EU and Ireland: End-of-waste criteria in action

The EU Waste Framework Directive (WFD) set the foundations for resource recovery. The EU WFD (2008/98/EC) provides the overarching legislative framework for waste management across the EU, setting the basic concepts, definitions, and principles for how waste should be handled. Among its provisions, the Directive establishes the possibility of defining end-of-waste (EoW) criteria, rules for when a material ceases to be waste, becomes a resource again, and can be used in new production processes. To date, the European Commission has adopted criteria for iron, steel and aluminium scrap, glass cullet, and copper scrap, while preparing further criteria for a range of materials, including plastics, textiles, and construction and demolition waste.[28] While the WFD has been fully transposed into national legislation across all Member-States, the specific EoW criteria have only seen partial uptake. This is in part due to the need for stronger monitoring of specific waste streams, establishing trust in recovered materials, and robust national reporting systems.[29]

Ireland transposed the EU's framework to the national level through criteria. Ireland transposed the EU's WFD into Irish Law in 2011 (S.I. No. 126/2011,[30] as amended by S.I. No 323 of 2020) and introduced new EoW regulations in 2024 (SI 660 of 2024).[31] In this time, Ireland has established both national EoW and national by-product criteria for a range of product categories, including for recycled aggregates (EoW-N001/2023),[32] road planings (BP-N001/2023),[33] and greenfield soil and stone (BP-N002/2024).[34] These materials are reused in new production processes, for example, road planings are incorporated into reclaimed asphalt pavements, and crushed concrete is processed into recycled aggregate.

Ireland's EoW system can accommodate requests from industry, either individual operators or a collective representing a sector or material type, for decisions on EoW status.[35] This flexibility enables Ireland to respond to emerging market opportunities and technological developments. The Environmental Protection Agency is the competent authority for decisions on EoW, and criteria are set following a robust technical assessment that includes appropriate stakeholder consultation. There is a strong emphasis on national, European, and International standards to ensure conformance of the EoW materials and demonstrate compliance with EoW criteria.

Ireland's approach offers an example of how EoW criteria can be implemented at the national level. While application numbers remain modest, there is strong interest from industry in seeking and obtaining EoW decisions; Ireland's approach shows how a small-scale but replicable framework can work in practice. Its EoW system has already informed other contexts, with Ireland providing technical assistance to Türkiye on designing their own EoW systems. This illustrates that solid steps are being taken to achieve clearer classification systems to differentiate between waste and product, and achieve legal clarity for businesses trading and transporting secondary raw materials, supporting wider adoption of circular economy practices.

Clear resource classifications enable recovered materials to re-enter production safely and confidently. Frameworks such as EoW criteria reduce uncertainty for businesses and regulators, strengthen market trust, and drive investment in recovery and recycling infrastructure. The EU's legislative foundation, paired with Ireland's adaptive national approach, illustrates how clear and flexible governance can bridge ambition and implementation, offering a replicable model for countries seeking to build reliable secondary material markets.

02

EXTENDED PRODUCER RESPONSIBILITY

Extended Producer Responsibility

EPR extends the producer's responsibility to the post-consumer stage of a product, by requiring companies introducing products to a market to finance their collection, sorting, and recirculation when the products are discarded by citizens.[36]
EPR schemes have the potential to deliver circular economy outcomes by shifting the financial and/or operational responsibility of managing discarded products from governments to producers.[37]

A well-designed and adequately implemented EPR policy can:[38]

Extended Producer Responsibility

Many current EPR schemes fall short in making the most of circular economy opportunities, as they focus on reducing waste through activities such as recycling and waste-to-energy, rather than maximising resource value through upstream activities like reuse or remanufacturing. To fully unlock the circular opportunities of EPR schemes, policymakers should consider key design principles, including:

Key design principles

1

Making EPR mandatory and fee-based. Voluntary approaches can have positive effects — such as helping producers take responsibility for their products, informing the development of mandatory policies, providing the visibility for infrastructure investment and waste management planning, and building confidence in ambitious targets — but they are often limited in scope, underfunded, fragmented, and driven by market profitability. In contrast, fee-based mandatory EPR schemes provide regulatory clarity, transparent governance and reporting, and an equal playing field that reduces free-riding.[39]

2

Using eco-modulated fees to incentivise upstream innovation. While simple fees, based on criteria such as product type or weight, reduce complexity and administrative burdens, they do not incentivise producers to improve product design. By contrast, eco-modulated fees that vary according to criteria such as repairability or recyclability encourage producers to design for circularity.[40]

3

Involving different stakeholders, including various ministries, local governments, businesses, the informal sector, and civil society. Coordinating all relevant stakeholders from the design stage through to implementation strengthens buy-in and social outcomes, improves compliance, and enhances the overall performance of EPR systems, while ensuring they are inclusive and socially equitable.[41]

4

Establishing clear performance targets, robust enforcement mechanisms, and transparent governance. Effective and credible EPR systems require a strong regulatory foundation and government capacity for oversight. Targets should go beyond collection and recycling to include reuse and repair, ensuring that progress is measured not only in terms of material recovery but also the extension of product lifespans and reduced need for virgin resources. Enforcement mechanisms — such as compulsory registration, regular reporting and audits, and penalties for non-compliance — ensure accountability and prevent free-riding, while transparent governance enables all stakeholders to access reliable data.[42]

Extended Producer Responsibility

EPR is increasingly being embraced by governments around the world.
Most schemes focus on sectors such as packaging, electronics, batteries, tyres, and vehicles, with recent expansions into textiles, furniture, and used oil.[43] Well-designed and more widespread EPR policies could unlock major gains for secondary materials markets and reduce reliance on virgin resources. Two examples from Germany and Brazil illustrate key aspects of EPR implementation in different settings.

Germany: Three decades of EPR in Germany

Germany's packaging EPR has continuously evolved since its introduction in 1991. Launched with the Packaging Ordinance (Verpackungsverordnung), the system has since been amended numerous times to respond to new challenges — among them, the establishment of a deposit return scheme for single-use beverage containers in the early 2000s. It has allowed consumers to return containers to any participating retailer, and the creation of the Central Agency Packaging Register (ZSVR) in 2019.[44]

Robust enforcement and oversight have been central to the system's effectiveness. In 2019, the Packaging Ordinance was replaced by the Packaging Act (VerpackG), which required all companies placing packaging on the market to register in a public database, and manufacturers of packaging subject to system participation to participate in one or more producer responsibility organisations. These, in turn, must report on the information provided by their members, and on recovery and recycling data. Fines for non-compliance can reach up to EUR 200,000. The ZSVR was created to oversee compliance and prevent free-riding, complementing the long-standing public education campaigns that have nurtured a strong consumer culture of at-source sorting and recycling.

The combination of incentives, strong oversight, and public engagement has delivered exceptional results. The introduction of eco-modulated fees based on materials and recyclability level, together with strengthened oversight to increase transparency, prevent free-riding, and ensure the system's effectiveness. Combined with sustained public education campaigns organised on behalf of the producer responsibility organisations, these measures have led to some of the highest packaging recovery and recycling rates in Europe. By 2023, Germany's packaging recovery rate had risen to 96%, and recycling rates to 69%, surpassing the EU's 65% target for 2025.[45]

Germany continues to expand and strengthen its EPR system. In August 2025, the ZSVR published its updated recyclability assessment framework, aligned with the EU's Single-Use Plastics Directive and the European Packaging and Packaging Waste Regulation (PPWR), marking the next step in strengthening Germany's packaging EPR framework. This update introduces a material-based assessment grounded in real-world sorting and recycling practices, covers all packaging categories defined under the PPWR, and includes revised measurement requirements to simplify compliance for companies.[46]

Germany's experience demonstrates both the potential and the challenges of mature EPR systems. Its long history provides valuable lessons on how producer responsibility can evolve, and where design and enforcement can be strengthened to achieve better outcomes. At the same time, packaging placed on the market has not declined, underscoring that recycling alone cannot curb material use.[47]

Brazil: Building a socially inclusive EPR

Effective material recovery depends not only on policies and infrastructure, but also on the inclusion of all relevant stakeholders involved. In Brazil, the inclusion of informal waste pickers has been crucial to achieving high recycling rates. Brazil has a long history of integrating waste pickers (catadores de materiais recicláveis) into resource management systems. In the late 1980s, the first waste picker cooperatives were established, and in the early 1990s, a recycling system integrating them as service providers was implemented. In 2001, the National Movement of Waste Pickers was created, leading to the official recognition of waste pickers in the Brazilian Classification of Occupations and enabling their identification in the main national data sets.[48] Municipalities are also obliged to prioritise waste picker organisations when awarding public waste management contracts, further strengthening their inclusion in the system.[49] These efforts to include informal waste pickers in resource management systems have helped Brazil achieve recycling rates of 97% for cans and 67% for cardboard, despite only a quarter of municipalities having separation-at-source collection systems.[50]

National circular economy policies have taken a leap forward over the past two years, reinforcing and expanding the basis for effective and inclusive EPR systems. Two presidential decrees are particularly significant. The first established the National Circular Economy Strategy, which embeds just transition and the inclusion of waste pickers as guiding principles for government action. The second regulates plastic packaging by setting targets for recycled content and reuse, complementing Brazil's EPR framework and enhancing the economic appeal of recycling and reuse compared with virgin materials. Together, these measures strengthen accountability across the value chain and improve the financial viability of inclusive recycling models.

Challenges remain in formalisation and social protection. Despite these achievements, employment among waste pickers remains largely informal, with limited social protection, exposure to health and safety risks, long working hours, and low earnings — often below the minimum wage. Women and family members frequently work without pay. Strengthening city-level contracts with cooperatives, ensuring fair compensation, and supporting non-organised workers could improve both social and system outcomes.

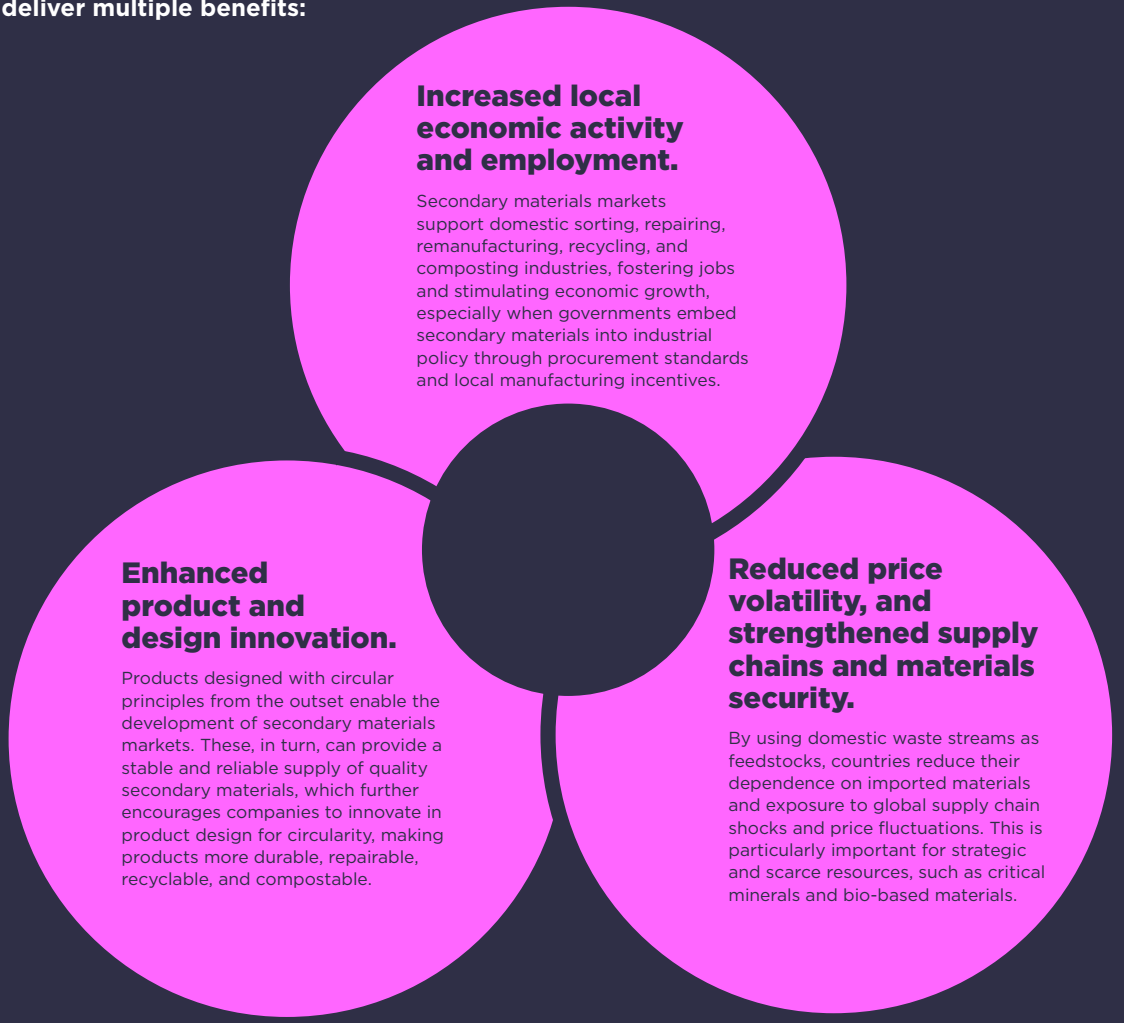
03

SUPPORTING SECONDARY MATERIALS MARKETS

Supporting secondary materials markets

Supporting secondary materials markets[51] means strengthening both the demand and the supply of reused or recycled materials. Well-designed policies help ensure that materials that have been recovered, recycled, or repurposed from waste or used products — known as secondary raw materials — can be reintroduced into production at a sufficiently suitable quality and price for manufacturing.

They can deliver multiple benefits:



Supporting secondary materials markets

Achieving these benefits hinges on three design principles that affect the feasibility and impact of secondary materials markets:

Key design principles

1

Develop quality standards and ensure market data reliability. Secondary raw materials often vary in technical properties (e.g. strength, purity, colour), which can reduce trust and demand, and face different challenges depending on the material — plastics deteriorate after multiple recycling cycles, metals can be contaminated, blended fabrics are hard to separate, and biomaterials can degrade. Harmonised quality standards and embedded product information systems, such as digital product passports, make secondary materials traceable, more predictable, and consistent, while better market data helps lower costs, increase confidence, and allow investors and manufacturers to make informed decisions.[52]

2

Introduce pricing signals. Secondary raw materials not only compete with virgin materials, which are often cheaper, they are also subject to volatile prices. Well-designed pricing schemes — such as targeted taxes on the extraction or use of virgin materials, and subsidies for secondary raw materials — can level the playing field between virgin and secondary materials, encouraging long-term investment.[53]

3

Foster cross-government and multi-stakeholder collaboration. Engaging relevant ministries, local authorities, industry, and other stakeholders to design policies, align objectives, and coordinate action ensures that secondary materials markets are robust and able to scale.[54]

Supporting secondary materials markets

Around the world, policies supporting secondary materials markets are still emerging. Yet they form an increasingly important area of action, with commitments starting to feature in national strategies and roadmaps.

Many of these build on existing resource and waste regulations, especially separate collection systems that make recovered materials more usable, with some being tailored to fit the needs of specific sectors and material value chains. Examples from China and the Republic of Korea illustrate how policies can support secondary materials market development across sectors, including plastics and the automotive industry.

Republic of Korea: An internationally aligned certification system for post-consumer plastic waste

In 2024, the Republic of Korea launched a national certification system to help build consumer trust in post-consumer recycled plastics in manufacturing. The voluntary scheme allows companies to certify and label products that meet a minimum threshold of recycled plastic content.[55,56] These labels provide consumers with a trusted source of information and signal industry leadership in the transition away from virgin plastics.

The collaboration across ministries and various stakeholders ensured technical robustness and market credibility. The initiative was led by the Ministry of Environment (MoE) via its agency Korea Environment Corporation, in collaboration with the Ministry of Trade, Industry and Energy, which developed industrial standards and pilot projects to trace recycled material use across supply chains.[57] Other stakeholders include the Korea Environmental Industry & Technology Institute, International Sustainability and Carbon Certification (ISCC), E-Circular Governance (a non-profit public corporation accredited by the MoE), appliance manufacturers, and recycling companies.[58]

Aligning domestic and international standards strengthened the global competitiveness of Korean businesses, while ensuring credibility at home. The system was developed to address a clear market challenge: Korean manufacturers previously relied on costly overseas certifications to access export markets such as the EU and United States, where recycled content requirements are mandatory. By recognising international certifications like ISCC as equivalent, the scheme reduces duplication and compliance costs for exporters and importers.[59]

Early signs indicate potential for large-scale impact, reducing virgin plastic use and enhancing consumer trust in recycled content products. Initial assessments estimate that the certified use of recycled plastics could rise from 2,600 to 7,000 tonnes per year, with the potential to reach 80,000 tonnes — enough material to manufacture 3 million refrigerators.[60] Looking ahead, the MoE is preparing legislation to expand certification to other recycled raw materials and has established a consultative body with stakeholders to guide further system development.[61]

Demand for secondary materials depends on trust. Quality assurance and certification give manufacturers and consumers confidence in recycled content, helping secondary materials to compete with virgin resources. Korea's certification system for post-consumer plastics shows how building this trust can scale market demand.

China: Scaling remanufacturing through national targets and pilots

Remanufacturing was positioned as a central pillar of China's national circular economy strategy, with coordinated action led by several ministries and other agencies,[62] including the Ministry of Industry and Information Technology and the China Association of Circular Economy.[63] In the 2017 Smart Remanufacturing Action Plan, the government set the goal of growing the sector to RMB 200 billion (USD 28 billion) by 2025, a goal that was reaffirmed in the 14th Five-Year Plan (2021–2025).[64] This vision sits within broader national targets, including raising resource productivity by 20% compared with 2020, producing 20 million tonnes of recycled non-ferrous metals, and expanding the resource recycling industry to RMB 5 trillion (USD 700 billion).[65]

China focused on expanding remanufacturing capacity and building scale across diverse key industries. Nearly 3,000 enterprises are active across more than a dozen sectors, from automotive parts and construction machinery to rail transit, industrial motors, mining equipment, and office electronics. Automotive parts, metallurgical power equipment, and construction machinery are the most advanced, together accounting for over 70% of the remanufacturing enterprises and nearly 80% of sales. National pilot programmes have also established 153 pilot enterprises, eight demonstration bases, and free trade zones that enable the cross-border remanufacturing of high-end equipment under favourable tax conditions.[66]

Recent policy measures and incentives reinforced momentum and drove uptake. Guidelines standardising remanufacturing practices, pilot projects in renewable energy equipment, and a RMB 150 billion (USD 21 billion) consumer goods trade-in programme, are driving industrial uptake and consumer participation.[67] Automotive remanufacturing sales reached RMB 50 billion (USD 7 billion) in 2021, accounting for 45% of the national remanufacturing industry's output value, while large-scale pilots in construction, agriculture, rail, and wind equipment highlight the breadth of opportunity.[68]

Remanufacturing has rapidly advanced, but challenges in recovery and consumer awareness remain. Ambitious targets, coupled with coordinated policy, can scale remanufacturing, unlocking resource efficiency, industrial competitiveness, and environmental gains. But despite progress, recovery rates are low, practices are fragmented, and consumer awareness remains limited — particularly in the automotive industry, where stronger implementation tools, including clear regulation, tax incentives, and robust collection systems, are essential to unlocking the sector's full value.[69]

National strategies set the direction and ambition for circular economy transitions. By defining shared goals and priorities, they create the mandate and coordination needed for targeted policy instruments — such as standards, incentives, and pilot programmes — to take effect. China's experience shows how a clear national vision can anchor and scale remanufacturing efforts across sectors.

A policy mix for a circular economy

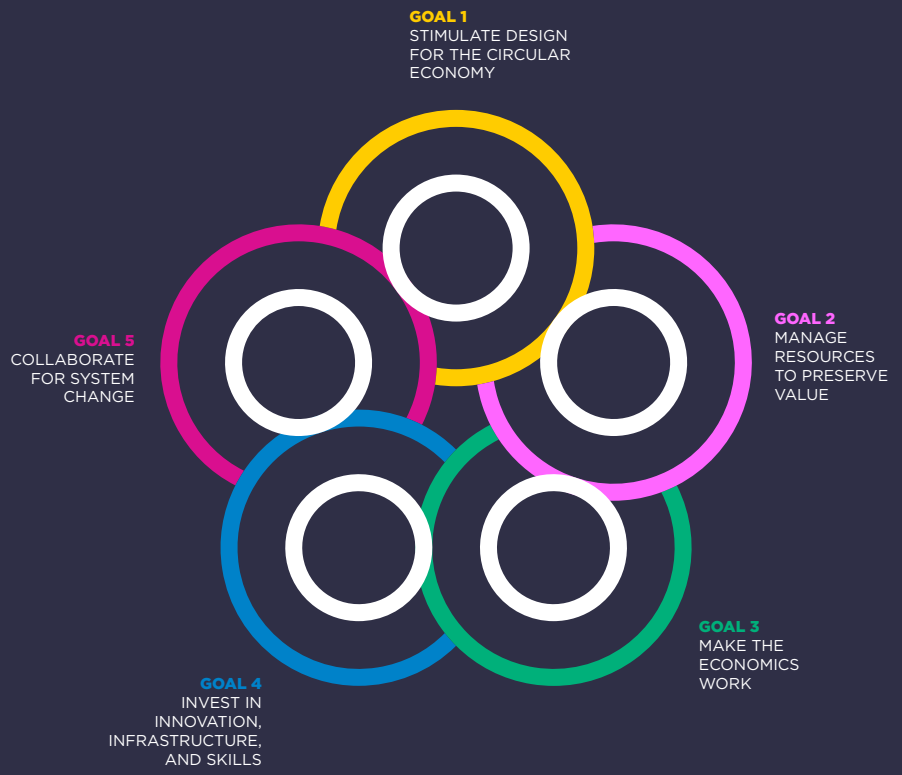
While this brief focuses on three enabling policy instruments, they should not be viewed in isolation. They form part of a wider ecosystem of policies needed to accelerate the transition to a circular economy, including climate and nature policies that safeguard ecosystems and ensure environmental and social benefits are realised in full. Ensuring coherence across this policy landscape is vital — for example, by requiring ministries to include circular economy impact assessments in budgets, and establish formal coordination bodies such as national circular economy councils or interministerial steering committees. Beyond policies to keep products circulating through the economy for as long as possible and at their highest value, there are four additional Universal Circular Economy Policy Goals[70] needed for the transition.

Design-focused instruments, such as product policies, building regulations, agricultural, land-use, and food policies, together with chemical guidance and international product and trade standards, ensure that what is placed on the market minimises resource use from the start and is designed according to circular economy principles, enabling efficient and cost-effective pathways throughout a product's life cycle.

Economic and fiscal instruments — including taxation, subsidies, state aid, and government funds; competition, labour, and trade policies; and procurement, disclosure, and accounting requirements — can be aligned with circular economy principles to make circular business models the norm rather than the exception. Without a focus on these instruments, the incentives and systems set up to stimulate circular design and manage circular flows can never truly scale and, at worst, be unintentionally undermined.

Public investment can directly fund the development of the infrastructure, innovation, and skills needed to scale the circular economy, while also unlocking private-sector capital for harder-to-finance opportunities through, for example, blended finance solutions. Targeted investments in these critical areas can be key for the successful implementation of circular design and material flow policies, while also creating economies fit to capitalise on new opportunities and support an inclusive transition.

Mechanisms that foster collaboration for system change, mainstreaming circular economy principles into existing and new policies fosters responsive collaboration across government departments, value chains, and economic sectors. Alignment and harmonisation nationally and internationally are crucial, as is the development of inclusive and cross-value-chain processes, which provide policymakers with the feedback they need from implementers and users. Measuring and tracking progress, as well as identifying data sets, are also crucial to inform good policy design and ensure effective implementation.



Recommendations

While the policy instruments and design principles outlined in this brief are intended to be globally relevant, their implementation must be tailored to national and local contexts. Policymakers should consider existing institutional capacities, economic structures, and social priorities to ensure policies are both effective and equitable, while framing them around economic opportunity and resource efficiency to help gain support in contexts where climate language is politically sensitive.

For policies aimed at keeping products, parts, and materials in circulation to be effective, governments should consider the following:

1

Provide clarity through unambiguous waste definitions and hierarchy, and reliable data systems.

Develop consistent and adaptable definitions of waste and resources within a clear hierarchy. Establish a hierarchy for how products, by-products, and waste should be circulated before disposal, covering both technical and biological cycles. Clearly distinguish between these categories, and introduce EoW criteria with quality and safety requirements for secondary materials, and define safe pathways for returning nutrients and organic matter to nature.

Establish reliable data-collection and reporting systems with clear institutional oversight. Mandate what information must be reported, by whom and how, while ensuring institutions have the capacity to oversee and enforce compliance. Waste monitoring and EPR reporting can generate accurate information on material flows, strengthen investor confidence, and enable strategic planning.

Issue transparent and accessible regulatory guidance. To enable businesses and other stakeholders to effectively comply and support design for reuse, repair, composting, and recycling, guidance should be easy to access, understand, and use, without undue costs or barriers.

2

Harmonise policies and standards nationally while ensuring mutual recognition of international frameworks.

Align waste and resource classifications across ministries and local governments. Coherence across environmental, trade, and customs policies avoids costly barriers and supports compliance.

Promote national-level standards for secondary raw materials and parts. Consistency builds trust in repaired, refurbished, and recycled products, parts, and materials, and facilitates trade and investment across regions. Beyond technical standards, this includes developing systems for traceability, certification, and monitoring.

Align national policies and standards with regional and international frameworks, maintaining strong national ambition and the integrity of existing frameworks. Pursue regional alignment where international harmonisation is less feasible, and strive for mutual recognition of standards and regulations to enable cross-border trade in secondary materials, reduce duplication, and strengthen international cooperation on circular economy goals.

3

Adopt an adaptive policy approach that evolves with new needs and circumstances.

Set progressive targets for reuse, repair, recycling, and composting. Expanding sector coverage over time to maintain ambition and drive innovation.

Maintain flexibility in compliance. Tailor approaches to sector-specific needs and emerging business models.

Build in regular review mechanisms. Update definitions, targets, and eco-modulated fee criteria in line with technological and market developments.

4

Integrate policies into coherent[71] packages that reinforce one another.

Combine strategic enabling instruments (resource classifications and waste definitions, EPR, and support for secondary materials markets) with other circular economy-related policies, including design, fiscal, investment, and mainstreaming tools.

5

Build enforcement and institutional capacity to deliver impact.

Strengthen cross-ministerial coordination and collaboration with the private sector and civil society to align enforcement and close regulatory loopholes.

Invest in institutional capacity through training, workforce development, resources, and tools to apply regulations and EPR consistently, while ensuring coordination between national and local governments.

Establish robust monitoring and compliance systems. Digital data platforms can track relevant economic, environmental, and social data — including material flows, greenhouse gas emissions, cost savings, and job creation — which helps build the business case for the circular economy.

6

Embed social inclusion and just transition principles into all policies.

Involve all stakeholders in policy design. Ensure new policy instruments are co-created with all relevant actors, including small, medium, and micro enterprises (SMMEs), civil society, and the informal sector.

Integrate SMMEs and informal workers into the circular ecosystem through financial support, training, legal recognition, and access to infrastructure such as collection and treatment equipment.

Safeguard equity and accessibility. Ensure policies support affordable and inclusive resource management pathways for all communities.

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