The economics of the transition to a more resource-efficient, circular economy

The OECD RE-CIRCLE project

POLICY PERSPECTIVES

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BETTER POLICIES FOR BETTER LIVES

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1 The OECD's **RE-CIRCLE** project

The OECD "Resource Efficiency and Circular Economy" (RE-CIRCLE) project provides policy guidance on resource efficiency and the transition to a circular economy. It aims to identify and quantify the impact of resource-efficient, circular economy policies to guide a range of stakeholders in OECD member countries and emerging market economies through quantitative and qualitative analysis.

The project is embedded in on-going work by the OECD on resource efficiency and the transition to a circular economy. This brochure includes results from the RE-CIRCLE project as well as from some of the major other recent OECD publications that directly relate to the topic.

The RE-CIRCLE project is structured around two complementary work packages toward sound evidence-based policy recommendations. The first workstream uses qualitative analysis on selected topics to guide policies to further the transition to the circular economy. The second workstream uses global environment-economy modelling to project the impacts of resource use and the effect of policy interventions.

The RE-CIRCLE project was carried out with funding from the European Union. The views expressed in this report can in no way be taken to reflect the official opinion of the European Union.

All RE-CIRCLE and related outputs can be found on oe.cd/recircle.

- The circular economy concept aims to transform the current linear economy into a circular model that gradually reduces the consumption of finite material resources by recovering materials from waste streams for recycling or reuse, using products longer, and exploiting the potential of the sharing and services economy. The circular economy is closely related to resource efficiency and sustainable materials management. By reducing the use of primary materials, a circular economy limits the associated adverse environmental effects of using materials throughout their lifecycle. In parallel, economic and social benefits are also critical for countries pursuing circular economy policies.
- The circularity of the economy is a means rather than a goal. There is no unique definition of a resource-efficient and circular economy, and governments place different priorities on the goals that transitioning to a resource-efficient circular economy can achieve. In this sense, improving resource efficiency and furthering the transition to a circular economy are essential elements of green growth. These objectives are increasingly recognised as critical components of broader environmental and economic policy, as illustrated in OECD, G7 and G20 initiatives and other international for a such as the United Nations system.

2 The business-as-usual outlook of materials use is unsustainable

The last century saw an unprecedented increase in natural resources and materials use, severely impacting the environment. In the coming decades, growing populations with higher incomes will drive a substantial increase in global demand for goods and services, increasing material resources to support this growth.

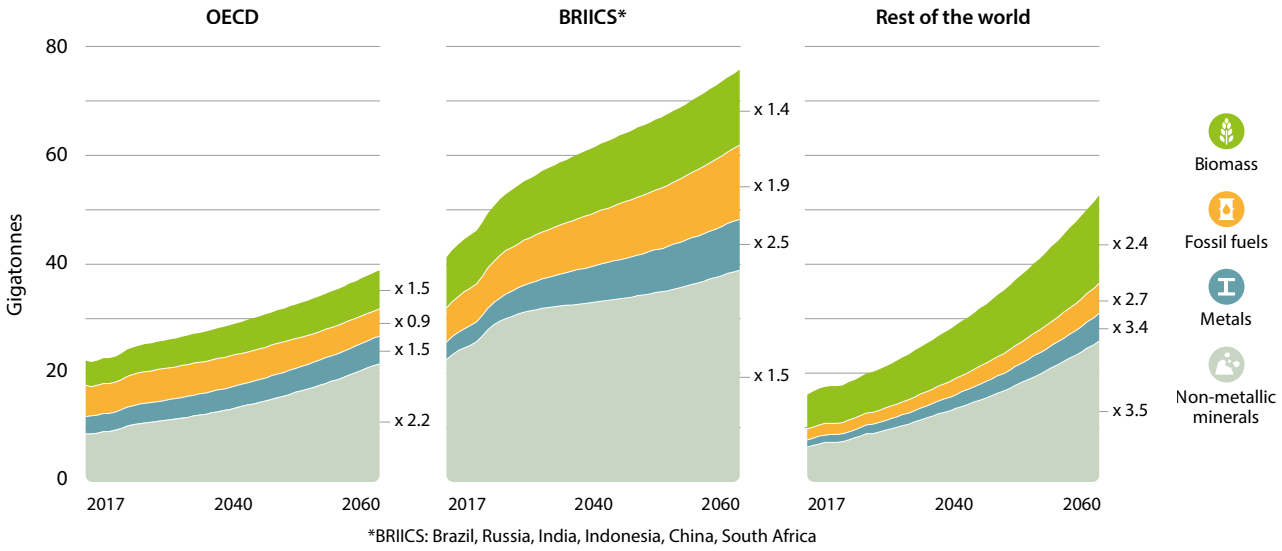
The *Global Material Resources Outlook* (OECD, 2019) uses the in-house multi-regional, multi-sectoral dynamic ENV-Linkages model to project an outlook for global materials use and their environmental consequences, providing a quantitative perspective to 2060 at the global, sectoral and regional levels for 61 materials (biomass resources, fossil fuels, metals and non-metallic minerals). The Outlook explains the economic drivers determining the (de)coupling of economic growth and materials use and assesses how the projected shifts in sectoral and regional economic activity influence the use of different materials.

MAIN MESSAGES ON BUSINESS-AS-USUAL MATERIALS USE

- Global materials use is projected to double from 79 Gt in 2011 to 167 Gt in 2060 (Figure 1). Non-metallic minerals, such as sand, gravel and limestone, represent more than half of the total volume of materials use.
- The most substantial growth in material use is projected to occur in emerging and developing economies. Large populations and rapid catching up of living standards in the People's Republic of China (hereafter China), and to a lesser extent in India and the rest of Southeast Asia, will drive global growth the most.
- The materials intensity of the global economy is projected to decline more rapidly than in recent decades. This reflects a relative decoupling. Global materials use increases, but not as fast as the gross domestic product (GDP) due to improved technology and a shift in economic activity towards less material-intensive sectors.
- Recycling is projected to gradually become more competitive. Yet, the substantial increase in demand for materials implies that both primary and secondary materials use increase at roughly the same speed.

→ The business-as-usual is unsustainable. Improving resource efficiency and stimulating the transition to a circular economy is key to addressing the wide range of environmental consequences linked to materials use. It is also critical to introduce policy objectives targeting the security of resource supply and creating jobs. In this context, governments face the complex challenge of designing policy packages to pursue the transition, while ensuring coherence with other policy domains such as trade and innovation policies. Such a policy package can also contribute to achieving the Sustainable Development Goals.

Figure 1: **Materials use increase – projections to 2060**



*BRIICS: Brazil, Russia, India, Indonesia, China, South Africa

Source: OECD (2020), « Improving resource efficiency and the circularity of economies for a greener world », *OECD Environment Policy Papers No. 20*, OECD Publishing, Paris, https://doi.org/10.1787/23097841.

THE ENVIRONMENTAL CONSEQUENCES OF A BUSINESS-AS-USUAL OUTLOOK

- More than half of worldwide greenhouse gas (GHG) emissions are related to materials management activities. Under current policies, GHG emissions related to materials management will rise to approximately 50 Gt CO_2-equivalents by 2060.
- Fossil fuel use and the production of iron, steel and construction materials lead to large energy-related emissions of GHG and air pollutants.
- Metals extraction and use has many polluting consequences, including acidification, climate change, and humans and ecosystems toxicity. The overall environmental impacts of extraction and processing of metals are projected to at least double between 2017 and 2060, driven mainly by the increase in the scale of materials use.
- At global level, the extraction and use of primary-raw -materials is much more polluting than secondary-recycled-materials.

Global plastics production has grown relentlessly in recent decades, with a high production-related carbon footprint, high volumes of waste, persistent pollution and harm to wildlife and the ecosystem.

The *Global Plastics Outlook I & II* (OECD, 2022 a, b) find that, globally, annual production of plastics and plastic waste doubled between 2000 and 2019. Only 9% of plastic waste in this period was ultimately recycled. While COVID-19 increased single-use plastic waste and plastics use fell overall, plastic use is projected to increase as the economy rebounds.

Mismanaged plastic waste is the main source of macroplastic leakage. Macroplastics account for 88% of plastics leakage, mainly resulting from inadequate collection and disposal. Microplastics in fresh water and terrestrial environments –and in several food and beverage streams– suggest that microplastics contribute substantially to the ecosystems and humans' exposure to plastics and their related risks. Furthermore, significant plastics stocks have already accumulated in aquatic environments, with 109 Mt of plastics in rivers and 30 Mt in the ocean. The carbon footprint of the plastics lifecycle is considerable, contributing 3.4% of global GHG emissions.

→ The plastics lifecycle is far from circular. Under current policies, the use of plastics could almost triple globally by 2060. Plastic waste is also projected to almost triple by 2060, with half of it being landfilled and less than a fifth recycled. Primary plastics will continue to dominate the feedstock, while recycled plastics will only make up to 12%. Plastic leakage is projected to double to 44 tonnes (Mt) a year. In sum, the international community is far from achieving its long-term objective of ending plastic pollution in the absence of significantly more stringent, ambitious and coordinated action.

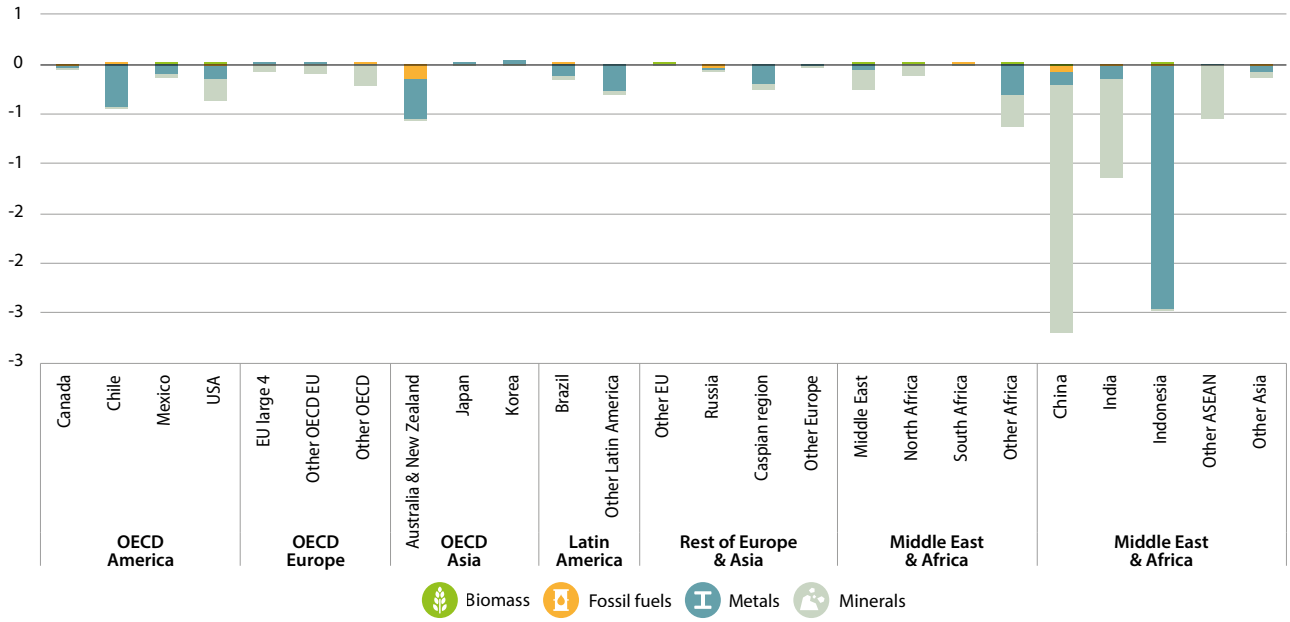
3 Ambitious policies are needed to decouple economic growth from materials use

FISCAL REFORM POLICIES TO REDUCE RAW MATERIALS USE

Model simulations for 2040 predict that using economic instruments to restrain primary material use and stimulate recycling and secondary materials would allow a relative decoupling of primary material use from economic growth in future years, facilitating the shift from primary materials to secondary materials.

The global *material fiscal reform* policy scenario investigates the implementation of taxes on primary mineral resources to use the revenue of these taxes to finance subsidies to recycled goods and secondary metal production. The OECD Environment Working Paper on *Policy Scenarios for a transition to a more resource-efficient and circular economy* (OECD, 2020) projects that shifting from primary to secondary materials resulting from a global *material fiscal reform* would significantly reduce the environmental impacts of materials use. At the global level, implementing such reform would reduce primary metal materials use by 27% and non-metallic minerals by 8% in 2040 (Figure 2).

Figure 2: **A material fiscal reform can significantly reduce materials use** (percentage change from baseline)



Source: OECD (2020), "Improving resource efficiency and the circularity of economies for a greener world", *OECD Environment Policy Papers* No. 20, OECD Publishing, Paris, https://doi.org/10.1787/1b38a38f-en.

While the core scenarios consider global policy action, additional simulations show that a partial regional implementation of the reform would reduce the benefits of the *material fiscal reform*. When only a few regions apply the reform, they lose some competitiveness for those countries. A partial implementation also implies some leakage effects: materials use increases in regions not implementing the *material fiscal reform* since they benefit from lower international prices for materials that result from the lower material demand in acting countries.

→ The significant projected material reduction of the global material fiscal reform would have a limited impact on global economic activity (loss of 0.2% of global GDP). The concrete economic effects would depend among others on whether countries are net importers or exporters of raw materials, as well as on the production technologies available and the input costs of primary and secondary materials. A few sectors could be severely impacted, for which accompanying policies could help make the transition acceptable.

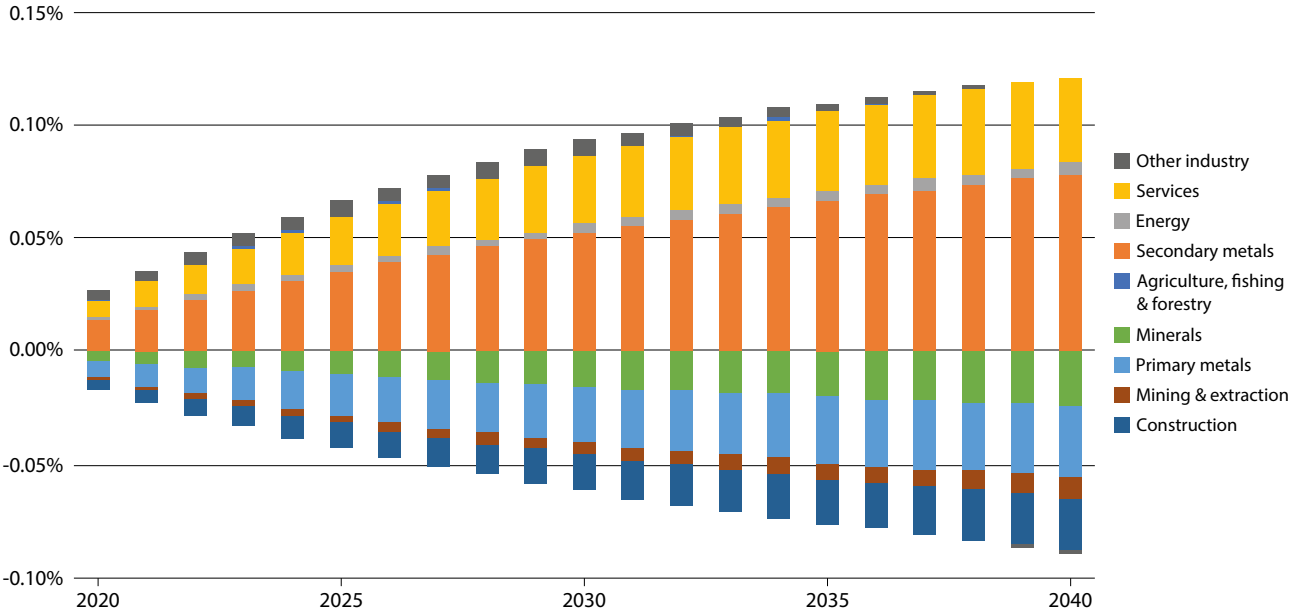
The transition to a more resource-efficient and circular economy can provide employment opportunities for countries, while being very effective in fulfilling its environmental objectives.

The OECD Environment Working Paper on *The jobs potential of a transition toward a resource-efficient and circular economy* (Chateau and Mavroeidi, 2020) shows that the reallocation of jobs due to structural changes towards a more resource-efficient and circular economy, resulting from the fiscal policy package amount to 18 million by 2040. Overall, net job creation is non-negligible, generating 1.8 million new jobs globally, but modest when compared to the overall job turnover.

However, there are significant variations across economies and sectors. Countries with large extraction sectors, such as Australia, New Zealand and countries of the Association of Southeast Asian Nations (ASEAN), are projected to face slightly more job destruction than job creation under this specific scenario (Figure 3). Generally, secondary metals and recyclable sectors benefit from large increases in employment, whilst industries heavily dependent on primary materials – such as construction and specific manufacturing sectors – experience job losses. Net job gains occur mostly in the services sectors that can grow faster in the policy scenario due to their low use of materials.

→ Globally coordinated action to decouple material use from economic activity is preferable for job creation. Otherwise, should only OECD countries implement resource efficiency and circular economy policies, OECD countries would experience net employment losses due to a relative loss of competitiveness.

Figure 3: **Global job creations outweigh job destructions in the material fiscal reform scenario** (percentage of total baseline employment)



Source: Chateau, J. and E. Mavroeidi (2020), "The jobs potential of a transition towards a resource efficient and circular economy", *OECD Environment Working Papers*, n° 167, OECD Publishing, Paris, https://doi.org/10.1787/28e768df-en.

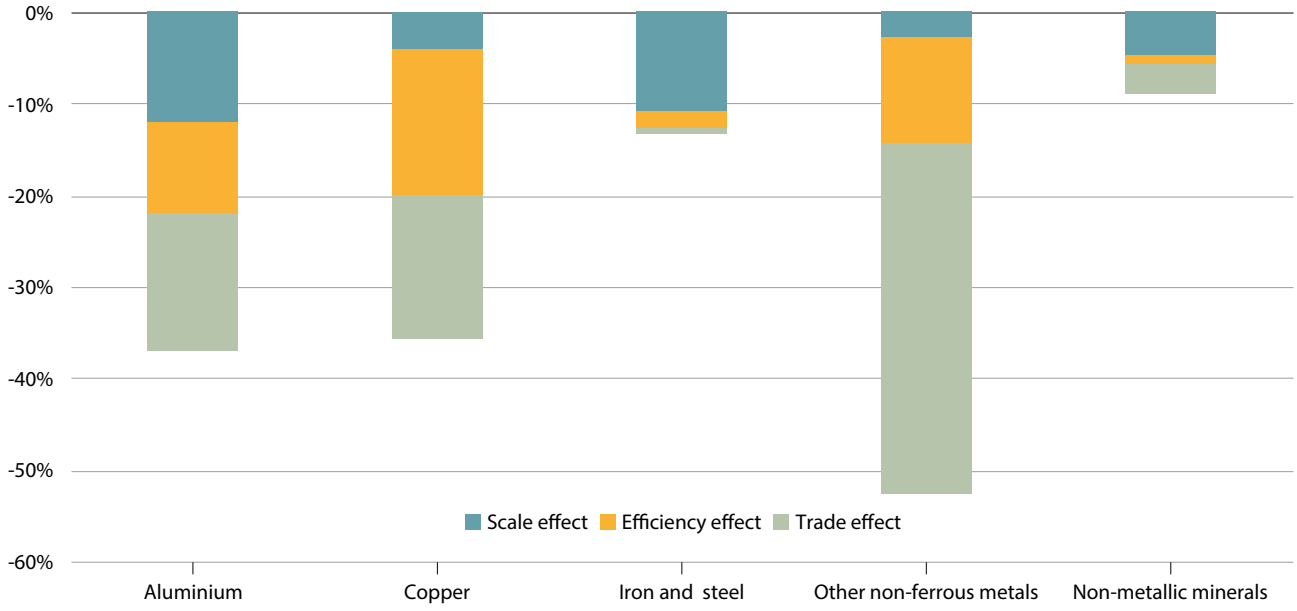
Regional shifts in production and trade-related effects account for roughly one-third of the total reduction in materials use.

A resource-efficient, circular economy transition will significantly affect international trade patterns. Global use of primary materials may decline, while secondary materials and sectors that do not rely on primary materials may increase, mainly if the transition boosts overall economic activity.

The OECD Environment Working Paper on *The consequences of a more resource-efficient and circular economy for international trade patterns* (Dellink, 2020) uses the *Material Fiscal Reform* scenario to project that a global resource efficiency and circular economy policy package will cause secondary materials to become cheaper through international trade. In contrast, primary materials will become more expensive. Regional shifts in production and trade-related effects – including sourcing inputs from more efficient producers in different regions – account for roughly one-third of the total reduction in materials use (Figure 4). The other two-thirds of materials use reduction come from the scale effect – reducing demand for materials-intensive commodities – and efficiency effects – producing commodities with fewer materials use per unit of output.

→ The circular economy transition will affect the structure of the economy and trade flows. Import and export demand for primary materials, secondary materials and waste may decrease in certain economies. At the same time, the circular economy transition may bring new opportunities for trade in services.

Figure 4: **Materials use in 2040 declines through multiple channels in a material fiscal reform scenario** (percentage change from baseline)



Source: Dellink, R. (2020), "The consequences of a more resource efficient and circular economy for international trade patterns: A modelling assessment", *OECD Environment Working Papers*, n° 165, OECD Publishing, Paris, https://doi.org/10.1787/fa01b672-en.

POLICIES TO BOOST CIRCULAR BUSINESS MODELS

Circular business models have the potential to drive the transition towards a more resource-efficient and circular economy and, in doing so, can significantly reduce the environmental pressure resulting from economic activity.

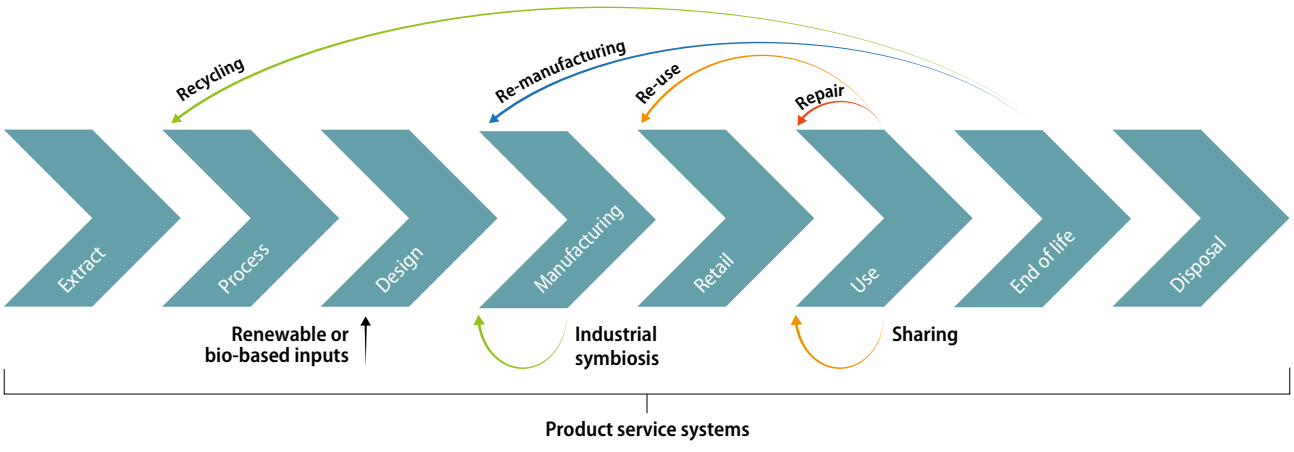
Circular business models represent different ways of producing and consuming goods and services. They can reduce the extraction and use of natural resources and the generation of industrial and consumer wastes, using existing materials and products as inputs across the value chain (Figure 5). Therefore, their environmental footprint tends to be considerably smaller than traditional business models.

The environmental outcomes of circular business models depend on their market penetration. The OECD report on *Business Models for the Circular Economy – Opportunities and challenges for policy* (OECD, 2019a) underlines that the market share of circular business models is currently limited. Recycling, remanufacturing and repairing, sharing spare capacity, and providing services rather than products only account for up to 15% of production in any given sector. However, some circular business models have experienced rapid growth in recent years, notably in response to new technologies. Others are relatively mature such as recycling and repair.

Public policies can create conditions under which circular models can scale up from their current niches, supporting the broader uptake of circular business models and helping realise their environmental benefits. Policy frameworks should also address several barriers, such as:

- The biases inherent in investment and consumer behaviour;
- The mispricing of natural resources that results from under-priced externalities and the provision of subsidies for extractive sectors;
- The trade policies that restrict cross-border flows of used products and secondary material feedstock; and,
- The transaction costs that hinder collaboration within and across value chains.

Figure 5: **Circular business models operate in different parts of the value chain**



Source: OECD (2019a), *Business Models for the Circular Economy: Opportunities and Challenges for Policy*, OECD Publishing, Paris, https://doi.org/10.1787/g2g9dd62-en.

Digital technologies can support decoupling economic activity from natural resource use and its environmental impacts.

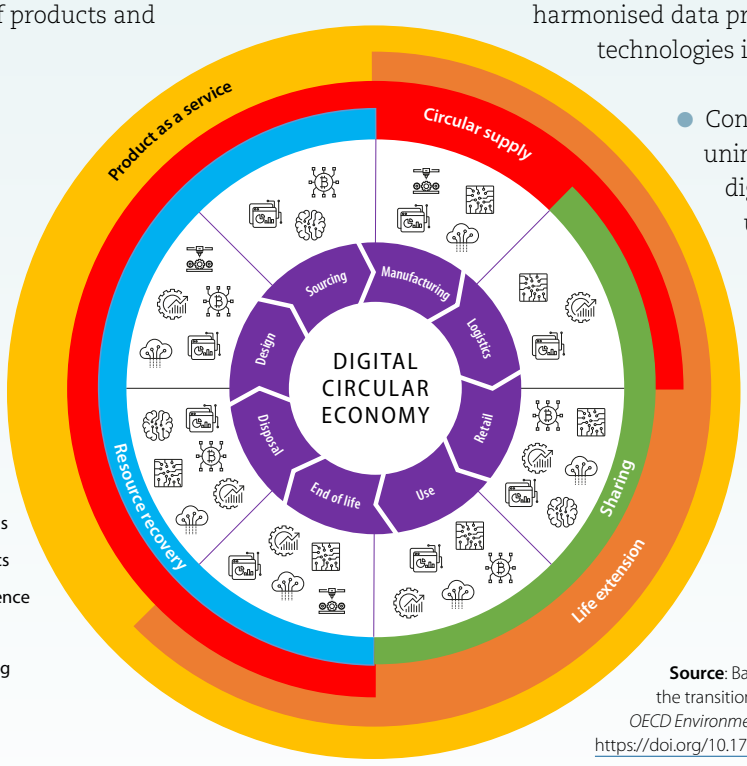
Through their ability to electronically monitor, interconnect and manage objects in the physical world, digital technologies help unlock the potential of circular business models and support decoupling economic activity from natural resource use and its environmental impacts

Digital technologies facilitate the scale-up of circular business models (Figure 6). For instance, digital technologies can reduce information asymmetries through digital passports providing an auditable record of a product's journey. They can also facilitate exchanges of excess materials across different sectors and industries by lowering transaction costs through digital sourcing platforms combined with artificial intelligence and blockchain. Moreover, digital technologies can improve consumers' perceptions about the quality of secondary materials used in final products, and facilitate design optimisation to enable easier disassembly and recycling of products and materials.

The OECD Environment Working Paper on *Digitalisation for the transition to a resource-efficient and circular economy* (Barteková and Börkey, 2022) provides insights into how digitalisation may fuel circular business models in the private sector and address market failures challenging circular activities. The paper underlines the importance of an enabling policy framework to accelerate the uptake of digitalisation for the resource-efficient and circular economy. Some of the critical elements of such a policy framework are:

- Addressing the systemic risks of digital technologies through, for example, enhanced data governance.
- The development of circular economy-relevant digital applications through research and development policies and programmes.
- Contributing to the development of standards and harmonised data protocols crucial for using digital technologies in the circular economy.
- Confronting the risks linked to unintended consequences of the digital circular economy scale-up, for example, by training the workforce with future-proof skills and regulating new working arrangements.
- Encouraging circular economy policy-making using digital technologies and the data they generate.

Figure 6: **Digital technologies facilitate the scaling-up of circular business models**



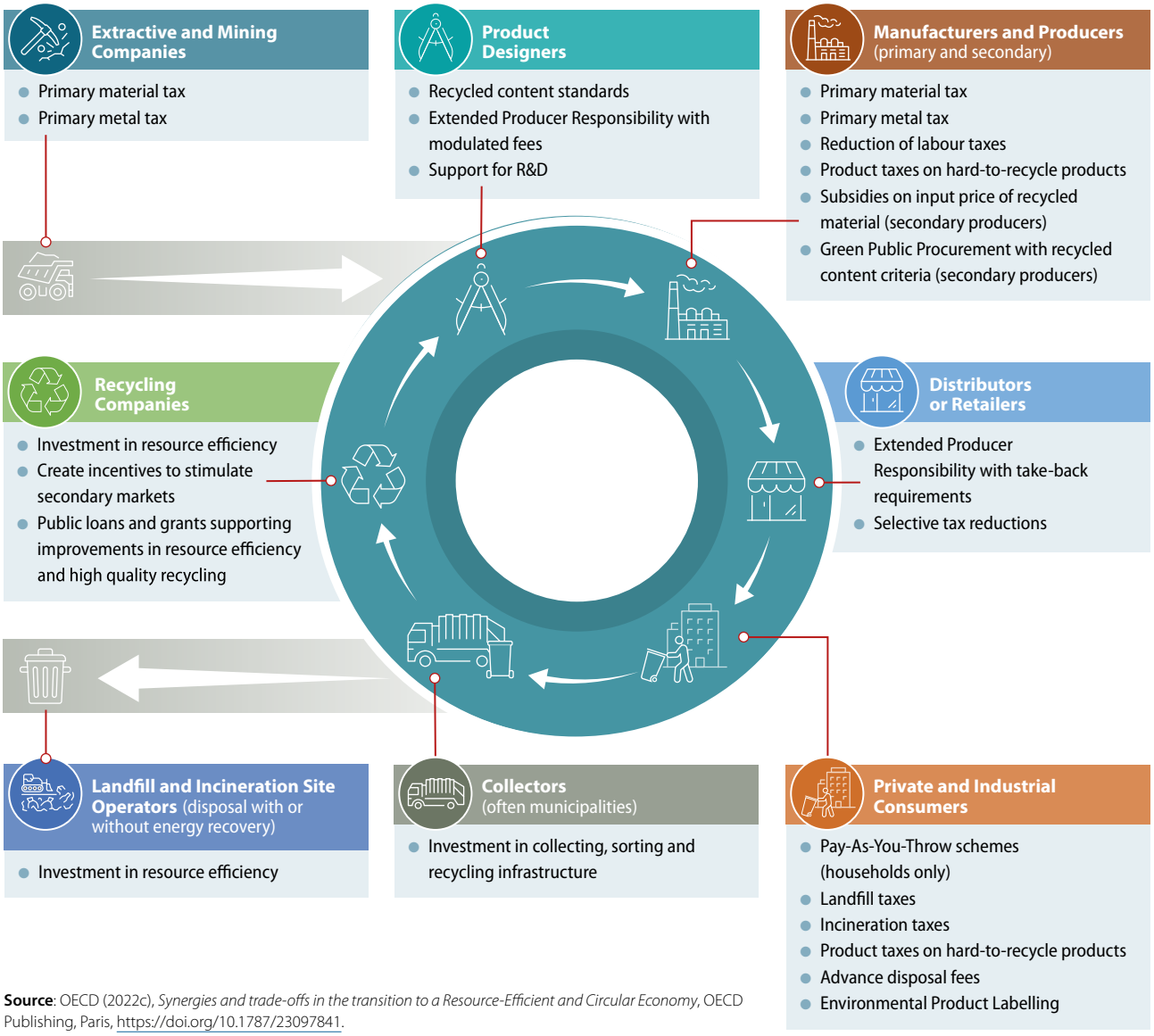
Source: Barteková, E. and P. Börkey (2022), "Digitalisation for the transition to a resource efficient and circular economy", *OECD Environment Working Papers*, n° 192, OECD Publishing, Paris, https://doi.org/10.1787/6f6d18e7-en.

4 Policy instruments throughout the lifecycle are needed to support resource efficiency and the transition to a circular economy

To effectively support the transition towards a resource-efficient, circular economy, policymakers must undertake a lifecycle approach to cover a range of environmental impacts that occur along the lifecycle of materials during the extraction, transport, processing, use and disposal of materials, products and waste.

Policymakers can rely on an extensive toolkit of policy instruments to support the transition towards a resource-efficient, circular economy (Figure 7). The OECD has produced policy analysis on a selection of them, such as fiscal instruments, Extended Producer Responsibility (EPR) schemes, measures to curb single-use plastic waste, and labelling and information schemes. This section provides an overview of each one of these policy instruments.

Figure 7: **A broad policy package can promote the transition to a resource-efficient, circular economy by targeting all economic agents**



Source: OECD (2022c), *Synergies and trade-offs in the transition to a Resource-Efficient and Circular Economy*, OECD Publishing, Paris, https://doi.org/10.1787/23097841.

subsidies on secondary-based production and the use of recycled inputs. These governmental efforts targeting the transition towards the resource-efficient, circular economy should be complemented by eliminating environmentally harmful subsidies. Yet, little of this is currently happening.

→ Ambitious policies can increase the level of circularity of the economy and reduce the environmental impacts of plastics at modest economic costs (loss of 0.3% of global GDP in the Regional scenario and 0.8% in the Global scenario by 2060). Whilst regionally differentiated levels of policy ambition can substantially reduce plastic pollution by 2060, global efforts can almost eliminate it by 2060. Developing economies would face higher costs of the policy packages, suggesting a need for international financial assistance.

Taxes on primary metal and mineral resources combined with channelling their revenues to finance subsidies for recycled goods and secondary metal production are central for a resource-efficient, circular economy transition

Environmental policies in many OECD countries use economic instruments such as environmental taxes and incentive subsidies to support the transition towards a resource-efficient, circular economy. Many countries have introduced landfill and incineration taxes to reflect the environmental costs of these forms of disposal. Some implement virgin material taxes, which can stimulate the use of recycled substitutes and, therefore, reduce the amount of waste material that is landfilled or incinerated. Complementarily, environmentally-motivated subsidies can encourage the development of secondary production and stimulate material productivity, especially in combination with other policy instruments such as EPR. For instance, these can take the form of subsidies on the input price of feedstock for recycling processes or on the selling price of recycled commodities.

The OECD Environment Working Paper on *Policy scenarios for a transition to a more resource-efficient and circular economy* (OECD, 2020) shows how fiscal instruments offer the prospect of achieving a given environmental improvement at a lower economic cost than through more rigid and inflexible forms of regulation. The report also underscores that a policy package combining material taxes with subsidies to the recycling sector and markets for secondary materials can be budget neutral. That is, governments take advantage of the additional revenues from the various taxes on materials to finance

Extended Producer Responsibility (EPR) schemes shift the responsibility for waste collection, treatment and disposal from municipalities towards producers, making producers responsible for the environmental impacts of their products at the end-of-life and generating much-needed waste management funding and increasing collection and recycling rates

EPR schemes are environmental policies in which producers' responsibility for a product is extended to the post-consumer stage of a product's lifecycle, namely concerning the collection of end-of-life products, sorting and recycling. By applying the polluter-pays principle, EPR schemes have achieved reduced disposal and increased recycling, while reducing the burden on public budgets and fostering new economic opportunities. They can also incentivise producers to design their products for subsequent recycling. Doing so supports waste prevention at the source, promotes product design for the environment, and contributes to public recycling and materials management.

For certain product groups, EPR schemes are already widely implemented in OECD countries and are generally successful. Yet, governments could further improve EPR performance and expand their use to new product groups. The OECD has produced policy guidance supporting these objectives.

In 2001, the OECD published *Extended Producer Responsibility – A Guidance Manual for Governments* to support the development of EPR systems. Many of the recommendations in the Guidance Manual,on the governance of EPR systems and the proper design of EPRs

are still relevant and should be applied more systematically. In 2016, the Guidance Manual was updated with the *Extended Producer Responsibility – Updated Guidance for Efficient Waste Management*, which looks at some of the new design and implementation challenges and opportunities of EPR policies. The Updated Guidance stresses that:

- The design and governance of EPR are crucial to their performance. Related issues range from target setting, monitoring, and enforcement to free-riding and financing.
- As the recycling and waste management industries have grown and become more concentrated, the potential financial gains for producers and the additional costs to society that result from anti-competitive behaviour have become more significant. EPRs need to be designed to prevent such behaviour.
- Better internalisation of end-of-life costs and stricter enforcement would also strengthen incentives for improving the eco-design of products and packaging. It is essential to set fees at the level where they recover the full cost of the end-of-life management of the products covered by the EPR and to modulate EPR fees according to their recyclability.

Producers can collectively fulfil their EPR obligations by collaborating and paying an EPR fee to a Producer Responsibility Organisation (PRO). The OECD Environment Working paper on *Modulated Fees for Extended Producer Responsibility Schemes* (Laubinger et al, 2021) underlines that the fee schedule set by most PROs currently provides weak incentives for design change by producers. Fee modulation – i.e. changing fees paid by producers in a collective EPR scheme based on product design – can give the producers more substantial design incentives. However, fee modulation adds complexity to the system.

The sophistication of fee modulation varies. While basic fee modulation applies simple averages per material or product type based on measurable end-of-life (EoL) cost differences, advanced fee modulation increases the specificity of producer fees through a more granular EoL cost allocation or a system of bonus/malus adjustments. The greater specificity of advanced EPR fee modulation strengthens Design for Environment (DfE) incentives. Moreover, the criteria used to modulate EPR fees determine the impacts at different lifecycle stages. In this regard, criteria on recyclability, recycling rates and the presence of hazardous substances can instigate eco-design changes that reduce the EoL costs of a product. Criteria aimed at increasing a product's lifespan or encouraging the use of secondary raw materials also instigate DfE, but the benefits are not limited to the EoL stage.

EPR AND THE IMPACT OF ONLINE SALES

Consumers have access to sellers abroad, but, in many cases, these sellers do not comply with EPR regulations in the country of sale. This creates several problems, such as sellers not undertaking physical take-back obligations and lowering collection rates for end-of-life products. Others do not pay EPR fees, resulting in financing problems for waste management activities.

The OECD Environment Working Paper on *Extended Producer Responsibility and the Impact of Online Sales* (Hilton et al, 2019) identifies increasing free-riding associated with the rapid growth of online sales of electric and electronic equipment (EEE). Some of the means through which governments can address free-riding in this context are:

- *Awareness-raising among online sellers*. This could be addressed, for instance, through the development of voluntary e-commerce codes of practice and increasing outreach by PRO and online marketplaces.
- *Better enforcement of EPR obligations to avoid deliberated avoidance*. The development of a single electronic register of producers of electric and electronic equipment for each jurisdiction and mechanisms allowing suspected free-riders to be reported would assist enforcement. At the supra- and international levels, better coordination of enforcement activities would improve cost-effectiveness.

- *Regulatory measures to address the complexity and ambiguity for sellers resulting from EPR regulation.* In the medium term, developing a harmonised framework for EPR registration would simplify administrative procedures across jurisdictions and lower compliance costs for producers of EEE. In the longer term, websites that sell electrical and electronic equipment under their name could be required to display the details of their PRO registration.

→ In 2015, plastic packaging constituted 141 million tonnes of waste, corresponding to 45.7% of global plastic waste generation. The OECD Environment Working Paper on Preventing single-use plastic waste – Implications of different policy approaches (Cornago et al, 2021) shows that market-based policies and bans on single-use plastics can help curb waste generation and littering. Yet, the effectiveness of market-based policies and bans on single-use plastics depends on a number of contextual features, including the availability of better alternatives, due to the revised EU waste framework directive.

Circular economy labels and information schemes (CELIS) can contribute to addressing barriers to increased resource efficiency and circularity, fully or partially addressing one or more resource efficiency or circular economy elements

CELIS can empower market actors to distinguish and discriminate products based on environmental performance along the value chain, stimulating market development and innovation in resource-efficient products and services. Information systems also enable better supply chain management and allow firms to identify environmental impacts and risks in their supply chains.

The OECD Environment Working Paper on *Labelling and Information Schemes for the Circular Economy* (Laubinger and Börkey, 2021) provides an overview of the current CELIS landscape –comprising business-to-business information systems as well as consumer-oriented labels– and assesses the drivers and barriers to a greater uptake of:

- *Business-to-business information systems (B2B).* While B2B information systems have contributed to environmental and social benefits, several barriers remain to a more significant uptake and harmonisation. For instance, confidential business information and intellectual property rights can pose a barrier to information disclosure; thus, a balance must be found to provide detailed information without infringing intellectual property rights. Another obstacle would be increased company transaction costs. Harmonisation and standardisation are, therefore, key to increasing the industry uptake and improving the value and usability of data.

- *Consumer-oriented information and labels.* Relevant information in consumer-oriented information and labels includes reliability, reparability, upgradeability, and durability. Labels targeting a product's lifespan are a small but increasingly emerging label segment. Also, labels and certificates for used goods are an opportunity to expand the market for and trade in used goods. Yet, consumer-oriented information and labels that encourage consumers to opt for longer-lived products or to repair and use them for a more extended timeframe remain niche.

There is a need for policy intervention to strengthen consumer-oriented information and labels. Governments could:

→ Facilitate methodological advances to support the integration of product lifespan criteria in product groups to reduce lifecycle impacts of products.

→ Further encourage enterprises and industrial sectors to develop information systems to improve resource efficiency along value chains and ensure their standardisation and harmonisation.

→ Instigate the development of information systems through regulatory information disclosure requirements and facilitate dialogues between stakeholders across value chains to improve the information's usefulness.

Ambitious policies can increase the level of circularity of the economy and reduce the environmental impacts of plastics at modest economic costs

POLICY PACKAGES TO ELIMINATE PLASTICS LEAKAGE

Combining policies that target the different lifecycles to curb plastics demand, increase product lifespans through repair and reuse, and improve waste management and recyclability, can drastically reduce plastics leakage to the environment and increase the share of recycled plastics

The *Global Plastics Outlook II: Policy Scenarios to 2060* (OECD, 2022b) compares two scenarios with different levels of stringency by 2060 to understand the policies needed for and the economic implications of drastically reducing the environmental impacts of plastics:

- The *Regional Action policy scenario* comprises a mix of fiscal and regulatory policies targeting all phases of the plastics lifecycle. It reflects regionally differentiated engagement, with more ambitious targets for OECD countries than non-OECD countries. In this scenario, although plastics use and waste would be partially decoupled from economic growth, stocks of plastics in the environment would continue to build up rapidly.
- The *Global Ambition policy scenario* explores a very stringent policy package that aims to reduce plastic leakage to near zero by 2060 globally. The package includes the same instruments as the *Regional Action policy scenario* but with more ambitious global targets. In the *Global Ambition policy scenario*, plastics and packaging taxes in combination with other plicies such as EPR and ecodesign would vastly reduce plastic use and waste. Recycling would become the most common waste management option, secondary plastics markets would surge, leakage to the environment would be substantially curbed, and macroplastic leakage almost eliminated. The Global Ambition package would decouple plastics use and waste from economic growth while reducing GHG emissions by 2.1 Gt CO_2e.

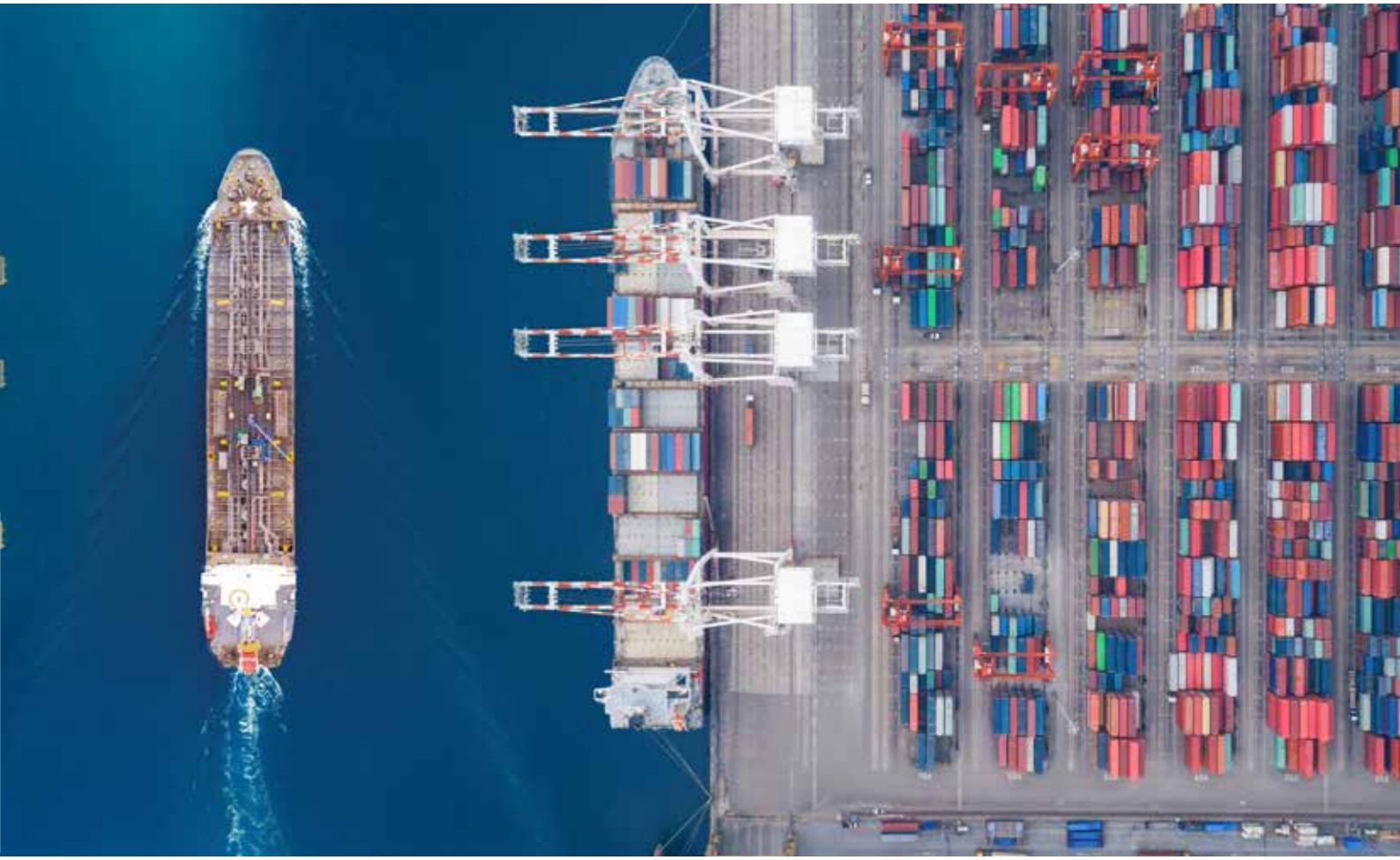
→ Ambitious policies can increase the level of circularity of the economy and reduce the environmental impacts of plastics at modest economic costs (loss of 0.3% of global GDP in the Regional scenario and 0.8% in the Global scenario by 2060). Whilst regionally differentiated levels of policy ambition can substantially reduce plastic pollution by 2060, global efforts can almost eliminate it by 2060. Developing economies would face higher costs of the policy packages, suggesting a need for international financial assistance.

5 International co-operation and co-ordination are essential

International co-operation and co-ordination are crucial to advancing toward a more resource-efficient, circular economy. The environmental damages generated by the current use and disposal of material resources are harming global commons, such as the climate and oceans, and require international co-operation to resolve.

The transition to circularity requires smooth but regulated international trade to allow circular business models to scale up sufficiently and become competitive while avoiding undesirable outcomes, not least waste dumping. In developing countries, the strategic deployment of Official Development Assistance (ODA) can play a central role in facilitating the transition by mainstreaming resource efficiency and material recovery in donors' programmes and projects.

Several encouraging signs show that some of this is now beginning to happen. For instance, at the United Nations Environment Assembly, governments have agreed to launch negotiations on developing a legally binding, global treaty to end plastic pollution. In parallel, OECD data show that there has been a significant increase in development assistance to tackle plastic pollution. Other multilateral fora, such as the G20 and the G7, are also actively pushing the resource efficiency agenda, including by exploring ways to alleviate barriers to trade and investment in environmental goods and services. Further efforts are needed, and the OECD will support these through its evidence-based analytical work.



INTERNATIONAL TRADE

While circular economy policies and initiatives largely take place domestically, they have essential interlinkages with international trade. In this regard, trade policies provide several opportunities for supporting the transition to a circular economy (Figure 8).

The OECD Trade and Environment Working Paper on *International trade and circular economy – Policy alignment* (Yamaguchi, 2021) explores how to mutually support circular economy and trade policies by identifying potential misalignments and opportunities to bring into line and strengthen both policy areas. On this subject, options for policy alignment through international co-operation include:

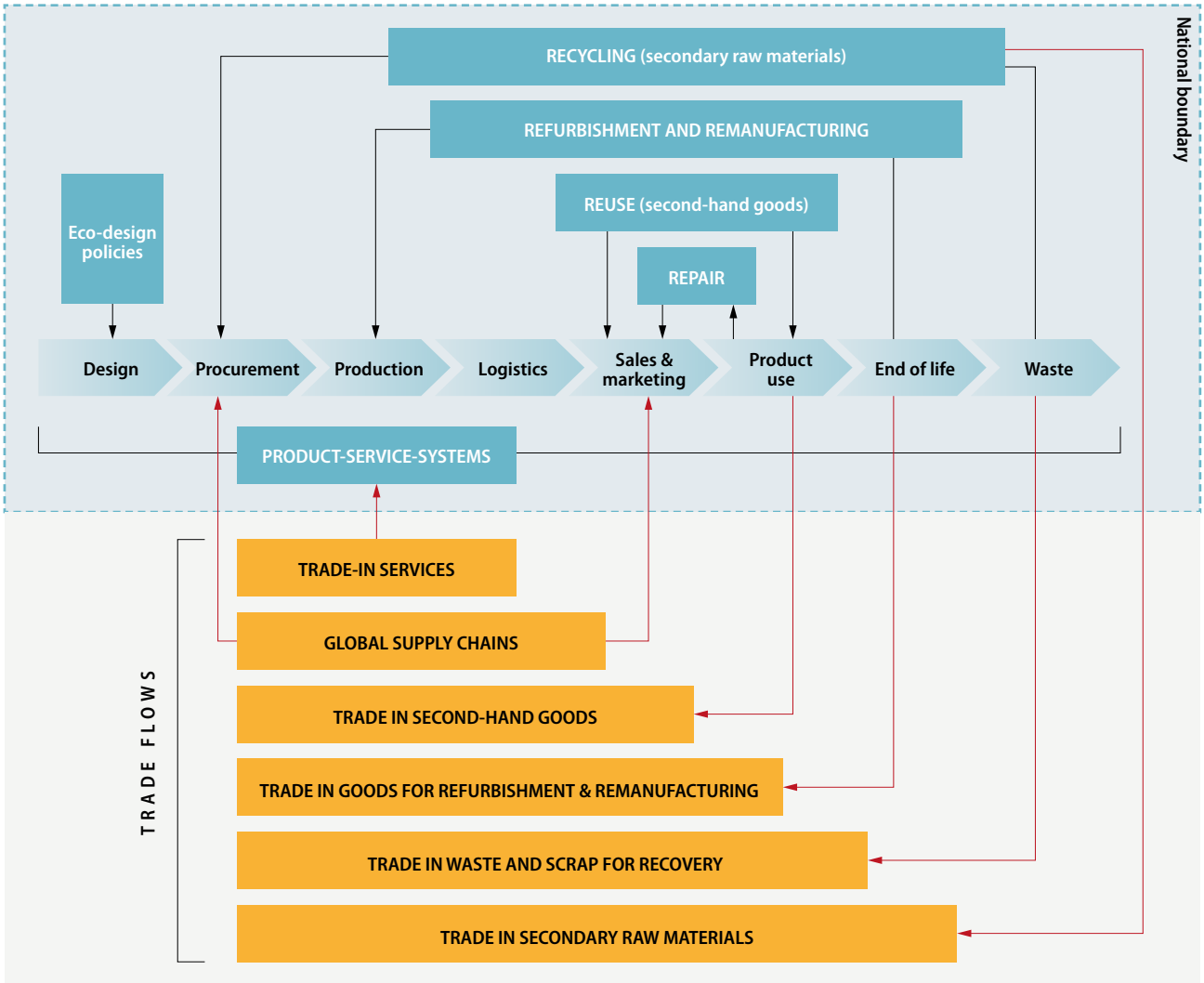
- Extended Producer Responsibility and product stewardship schemes can exchange global information on competent bodies and free-riders to tackle illegal waste trade and free-riding from online sales.
- Circular economy-related standards can be considered for harmonisation or mutual recognition of conformity assessment procedures to facilitate trade for a circular economy – e.g. material quality standards for secondary raw materials and standards for sustainable production.
- Definitions of waste and scrap, second-hand goods, and goods for refurbishment and remanufacturing, and their relation with the Harmonized System codes, could be clarified. It is also necessary to have a better understanding of the drivers and impacts on the environment of trade in waste, scrap and second-hand goods, as well as of the rationale and effects of imposing trade restrictions on waste and scrap and secondary raw materials.
- International co-operation can provide opportunities for further policy alignment under multilateral frameworks (e.g. Basel Convention, WTO, and OECD) and regional trade agreements.

→ Trade in waste and scrap plays an important role in strengthening markets for recycled materials, including plastics, as it can help achieve economic efficiency through, for instance, economies of scale. However, trade can also lead to pollution when recipient countries lack the capacity to treat waste in an environmentally sound manner.

→ The OECD Environment Working Paper on Monitoring trade in plastic waste and scrap (Brown et al, 2022) identifies and assesses trends in trade patterns of plastic waste and scrap in recent policy developments, notably strengthening the controls applied in the Basel Convention. The paper finds that OECD Member Countries continue to make up a significant share of global trade in plastic scrap and waste (89% of global reported exports and 67% of global reported imports by weight), but that exports to non-OECD countries have continued to shrink, as well as the overall volume of trade.

While circular economy policies and initiatives largely take place domestically, they have essential interlinkages with international trade.

Figure 8: **International trade can create opportunities for a circular economy transition**



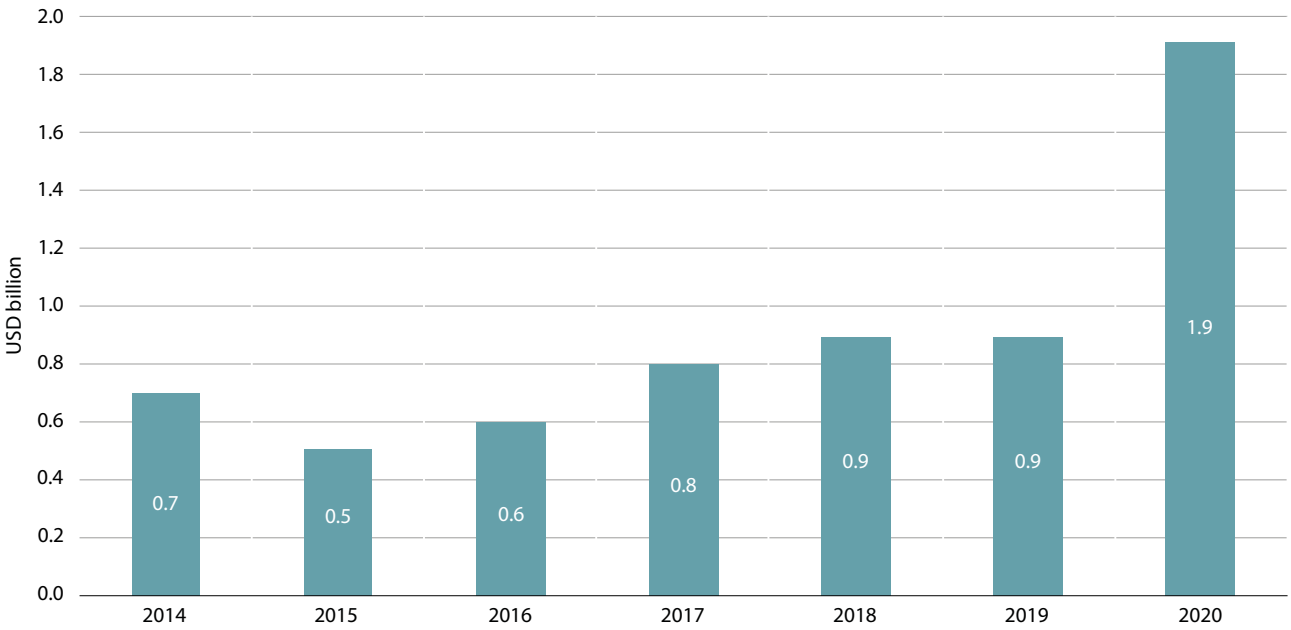
Source: Yamaguchi, S. (2021), "International trade and circular economy – Policy alignment", *OECD Trade and Environment Working Papers*, n° 2021/02, OECD Publishing, Paris, https://doi.org/10.1787/ae4a2176-en.

DEVELOPMENT CO-OPERATION CAN SUPPORT A GLOBAL TRANSITION

Official Development Assistance (ODA) is central to supporting developing countries' needs and priorities in their transition toward resource-efficient, circular economies, particularly in a context where the transition costs fall disproportionately on developing countries. The lack of financing and insufficient technical knowledge and capacity are common barriers to setting up waste services and implementing resource efficiency policies and initiatives in developing countries. Many environmental and health impacts associated with the illegal dumping and burning of waste, particularly hazardous waste, can be alleviated with formal waste collection and treatment services that are accessible and affordable. The investments in basic waste management infrastructure in low- and middle-income countries are estimated to be EUR 25 billion annually.

The OECD Environment Working Paper on *The role of development co-operation in tackling plastic pollution* (Agnelli and Tortora, 2022) highlights that, to date, a small share of ODA from members of the OECD's Development Assistance Committee (DAC) targets material recovery or resource efficiency (Figure 9). ODA covers 2% of low and middle-income countries' basic waste management infrastructure needs. DAC members and other donors could consider directing a more significant proportion of ODA towards developing sound waste management infrastructure and legal frameworks in developing countries. They could also further strategically deploy ODA in their programmes and projects to foster the transition towards a resource-efficient, circular economy in line with partner countries' needs and priorities. Furthermore, by aligning development finance with resource productivity goals, ODA could support the deployment of the capacity needed for improving resource efficiency and enabling faster technology transfer between countries.

Figure 9: **Official development finance to curb plastic pollution is on an increasing trend**



Source: Agnelli, A. and P. Tortora (2022), "The role of development co-operation in tackling plastic pollution: Key trends, instruments, and opportunities to scale up action", *OECD Environment Working Papers,* No. 207, OECD Publishing, Paris, https://doi.org/10.1787/721355cb-en.

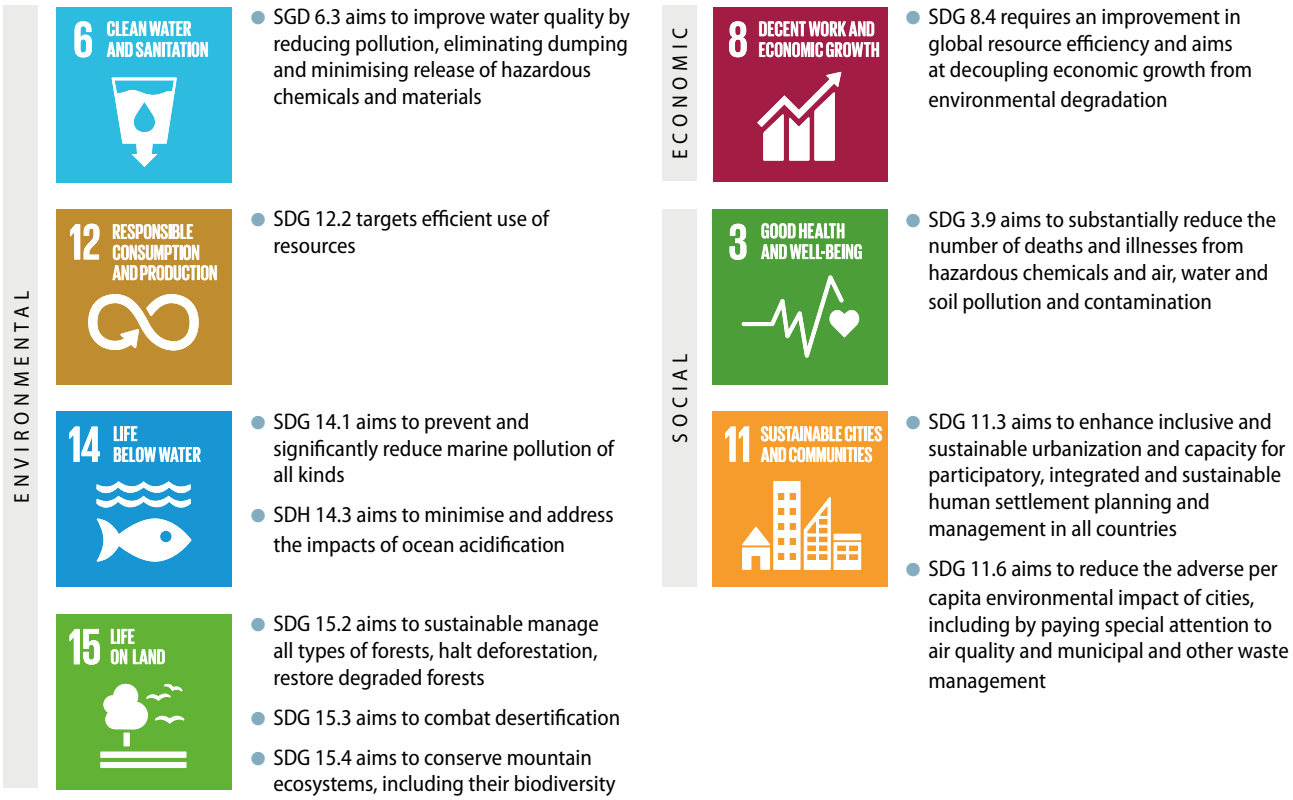
6 Policy alignment for the resource efficiency and circular economy transition brings crucial benefits

The potential for economic, environmental and social benefits of the resource-efficient, circular economy transition will only be realised if policies are coherent, synergies are exploited, and significant trade-offs are either avoided or mitigated.

Transitioning to a resource-efficient and circular economy requires a comprehensive policy package with large-scale adjustments to economic activities. To increase recycling, the use of primary materials needs to be curtailed, secondary markets stimulated, and waste management improved. All while enhancing security of the supply of essential resources for sustainable economic growth. Due to the significant potential for economic, environmental and social benefits, such a policy package toward a resource-efficient, circular economy can also be a crucial contributor to achieving the Sustainable Development Goals (Figure 10).

The OECD Environment Policy Paper on *Synergies and trade-offs in the transition to a Resource-Efficient and Circular Economy* (OECD, 2022c) underlines the synergies policymakers can create between different resource-efficient and circular economy transition objectives when designing policy packages. It also highlights potential trade-offs that may arise in their implementation. The paper shows that the existing OECD policy analysis provides a toolkit for governments to take more ambitious actions toward a resource-efficient, circular economy. In addition, OECD modelling projects that the transition can bring significant environmental gains while preserving economic growth and social objectives, complemented with flanking policies addressing potential negative implications.

Figure 10: **The Sustainable Development Goals are intricately aligned with the goals of resource efficiency and circular economy transition**



Source: OECD (2022c), *Synergies and trade-offs in the transition to a Resource-Efficient and Circular Economy*, OECD Publishing, Paris, https://doi.org/10.1787/23097841.

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For more information on the RE-CIRCLE project, please visit the project website: **oe.cd/recircle**

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RE-CIRCLE
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