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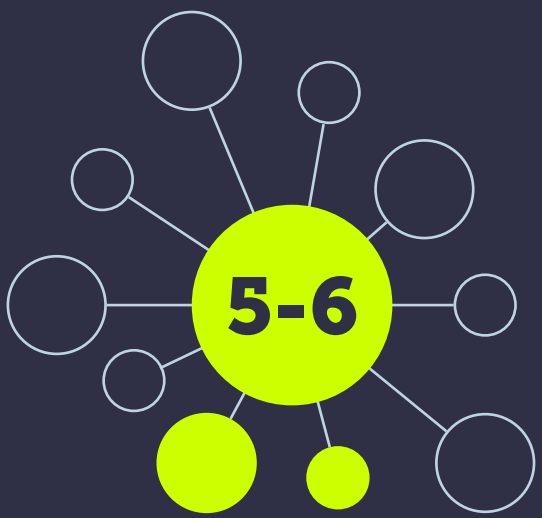
10 circular investment opportunities

for a low-carbon and prosperous recovery

Many voices from governments, businesses, and civil society have been calling for a response to the devastating impacts of the Covid-19 pandemic that does not turn attention away from other global challenges such as climate change, biodiversity loss, and plastic pollution. Yet, solutions from the past will not be up to the problems we face today, as the multifaceted nature of the crisis we are experiencing requires new thinking and the redesign of our current economic model.

In an unprecedented response to the Covid-19 crisis, trillions in economic stimulus are being unveiled all around the world. In the next stage of their recovery plans, governments will have to decide where these funds will be allocated. The circular economy, as an instrument to decouple economic growth from resource use and environmental impact, opens up the way for a resilient recovery and a next wave of economic prosperity. By fostering innovation and competitiveness, reducing resource dependency and environmental impact, and creating new jobs, the circular economy presents a promising way forward.

Building on the past ten years of research carried out on the circular economy, the Ellen MacArthur Foundation highlights in this paper how policymakers can pave the way towards a resilient recovery. As part of this, ten attractive circular investment opportunities that spread across five key sectors of the built environment, mobility, plastic packaging, fashion, and food, have been identified. Each sector is independently explored in a series of Insight papers, along with a piece offering perspectives on policy outlook. These individual papers, as well as the full combined paper, can be found at the Ellen MacArthur Foundation page: Covid-19: The economic recovery.



Plastic packaging

Two circular investment opportunities for a low-carbon and prosperous recovery

95% of plastic packaging material value, or **USD 80-120 billion**, is being lost from the global economy **annually**

Plastics have played a critical role during the pandemic, especially in keeping hospitals running by protecting frontline workers. At the same time, the pandemic has further emphasised the wasteful nature of single-use packaging. As we combat the pandemic and shape a resilient economic recovery that also mitigates global risks, a response is needed to ensure that plastics never become waste. With the growth of e-commerce, investments in reuse models offer attractive opportunities that meet public demands, save on material costs, and reduce the need for single-use packaging. Coupled with infrastructure for collection, sorting, and recycling, plastics can be decoupled from the consumption of finite resources while drastically reducing their leakage into natural systems. Such investments will help shape an economic recovery for the plastics packaging industry that is not only competitive and resilient, but that also offers significant climate and environmental benefits.

As the world is fighting the Covid-19 pandemic, plastics have become an even more key staple of our everyday life, with the global medical community requiring protective equipment, customers stockpiling sanitary products, supermarkets increasing their grocery packaging, and retailers relying on e-commerce shipments, etc. The global demand for medical supplies and other essential goods, that are often disposable and not recyclable, has therefore increased since the Covid-19 outbreak.[1]

In fact, at this rate, the global packaging market size is expected to grow from USD 909 billion in 2019 to USD 1,013 billion by 2021—with the plastic segment leading the market.[2] Plastic packaging, the focus of this paper, is and will remain the largest application; in 2017, packaging represented around 30% of the total volume of plastics used.[3]

With hygiene measures being the number one priority during the pandemic, many countries around the world have, at the start of the Covid-19 crisis, either lifted or delayed bans on certain single-use plastic packaging, based on the misperception that they are safer than reusable and compostable alternatives. Concerns over reusable packaging and virus transmission have however now subsided. Scientists from various countries signed a statement on 22 June 2020 declaring reusable packaging is safe to use, by employing basic hygiene.[4] The lockdowns have also forced many recycling centres to shut down or temporarily cease operating during the pandemic. Regular waste management practices have

also experienced extra pressure, leading to inappropriate management strategies, including mobile incineration, direct landfills, and local burnings.[5] In addition, the Covid-19 pandemic is happening at a time when already 95% of plastic packaging material value, or USD 80–120 billion, is being lost from the global economy annually, with only 14% of plastic packaging being collected for recycling.[6] In addition, amidst the pandemic, the plummeting of oil prices globally to around USD 40 per barrel (as of October 2020) is further challenging the market for recyclates.[7]

Looking towards the future, the Covid-19 crisis is likely to alter or amplify certain packaging megatrends.[8] With more people working from home and businesses digitising their services, many will be increasingly inclined to purchase online and opt for home delivery services, leading to a strong acceleration of e-commerce shipments. Customers are also starting to change their behaviour, becoming more price and health conscious than before. The Covid-19 crisis has also forced many businesses to deal with uncertainty and those that have leveraged digital assets to be able to react quickly to unexpected changes, have been found to be more resilient.

The circular economy can play a vital role in tackling the plastic waste issue that predated the pandemic as well as shaping an economic recovery, in which the system for plastic packaging not only delivers cost and material savings, but also keeps waste and pollution out of the environment. In a circular plastic packaging system this vision is realised by: eliminating the plastic items that are not needed; innovating so that all plastics that are needed are designed to be safely reused, recycled, or composted; and keeping materials in circulation to keep them in the economy and out of the environment.

A number of attractive circular investment areas could help attain this vision, including: new delivery models to eliminate problematic or unnecessary plastic packaging; innovative reuse business models to reduce the need for single-use packaging; material innovation in recyclable and compostable alternatives to improve recycling quality, eliminate hazardous chemicals, and decouple plastics from the consumption of finite feedstocks; and collection, sorting, and recycling infrastructure to scale-up the production of high-quality secondary materials and keep plastics out of the environment.

Though all of these investment areas can help contribute to the creation of a more resilient plastic packaging system, two especially attractive opportunities in the current scenario emerge in:

5. Innovative reuse business models for plastic packaging
6. Plastic collection, sorting, and recycling infrastructure

These selected opportunities highlight especially attractive areas that can help address both the short- and long-term goals of the public and private sectors. Together they provide solutions to key challenges created by the pandemic; meet governmental priorities for economic recovery; offer economic growth potential; and help reduce the risk of future shocks.

Innovative reuse business models for plastic packaging

to enhance material productivity and reduce leakage

The global awareness around plastic pollution, raised by the bleak prospect of having more plastic than fish in the ocean by 2050, predated the pandemic.[9] Innovative reuse solutions exist that can ensure plastic never becomes waste. These can offer significant user and business benefits, that together can help deliver a more resilient and low-carbon economic recovery.

The European Commission is aiming to make **all plastics packaging** placed on the **EU market** either **reusable or recyclable** in a cost-effective manner **by 2030**

Investing in reuse business models helps reduce the need for single-use packaging, while unlocking significant economic benefits. It enables high-quality materials to be kept in circulation within the economy, unlocking substantial material savings and societal and environmental benefits. Nevertheless, reuse models still represent only a small part of the total packaged goods market. For example, while over a third of the New Plastics Economy Global Commitment signatories in the packaged goods sector are exploring reuse business models, only 3% of signatories' packaging is reusable today.[10] However, replacing just 20% of single-use plastic packaging with reusable alternatives globally offers an economic opportunity worth at least USD 10 billion, while saving about 6 million tonnes of material.[11] Moreover, reusable packaging could help enable the 'Physical Internet'—a logistics system based on standardised, modularised, shared assets—that could unlock significant economic value, estimated at USD 100 billion annually in the United States alone.[12] These opportunities are therefore still largely untapped, with the reusable packaging market predicted to experience continued growth and register USD 145 billion in 2026.[13]

Besides economic benefits, reuse business models can also play a critical role in helping tackle pollution, and deliver user and business benefits. As an example, a report by Material Economics estimated that business models that increase the reuse of plastic products could reduce emissions by around 3 million tonnes per year by 2050.[14] Reusable personal and home-care bottles, coupled with innovative delivery models, could achieve an 80–85% reduction in GHG emissions versus today's traditional single-use bottles.[15] When enabled by digital technology and changing customer preferences, these can also help unlock benefits for both businesses and customers.[16] Reuse models can, for example, enable superior user experiences by enhancing the look, feel, or functionality of reusable packaging, while product customisation options can be offered to help meet the customer's individual needs. With digital technologies such as Radio Frequency Identification (RFID) tags, sensors, and GPS tracking incorporated into reusable packaging systems, information on user preferences and system performance can be gathered and used to improve services. In addition, businesses can help achieve brand loyalty and customer retention through the introduction of deposit and reward schemes. Operations can also be optimised by building economies of scale for distribution and logistics, while packaging and transportation costs can be reduced by supplying compact refills for reusable containers.

The set-up of enabling conditions for stimulating the development of reuse packaging solutions was already underway before the pandemic. Regulations had been put in place around the world—in a wide range of countries including Peru, Australia, and Zimbabwe—to ban single-use plastics in a collective effort to start tackling plastic waste pollution. The European Commission in particular rolled out its Single-Use Plastics Directive banning ten single-use plastic products by 2021,

and has also put regulations in place to help ensure that all packaging on the EU market is reusable or recyclable in an economically viable way by 2030.[17] Other measures that have been taken around the world include: extended producer responsibility (EPR) schemes, deposit return systems, landfill taxes, as well as the set-up of mandatory requirements for packaging, e.g. recycled content and waste reduction measures. Reuse models are therefore here to stay, with the returnable packaging market projected to grow from USD 37 billion in 2018 to USD 59 billion by 2026 (across industries), at a CAGR of 5.9%—with the plastic segment expected to lead the returnable packaging market in terms of both value and volume.[18]

Based on the science and guidance from public health professionals, evidence supports the ability to safely continue using reusable packaging systems, while navigating the Covid-19 pandemic and beyond. This was expressed on 22 June 2020, with 100 scientists from 18 countries stating that, "based on the best available science and guidance from public health professionals, it is clear that reusable systems can be used safely by employing basic hygiene".[19] Concerns over the safety of reusable packaging have since subsided. High standards and protocols to ensure hygiene and safety are an important part of any packaging system, whether single-use or reuse.[20] Safety and hygiene are not determined by an item being disposable or reusable, but by how packaging and containers are managed and handled.

Most reuse systems, some active for decades, have withstood the impacts of the pandemic without needing to make any changes within their cleaning processes. Reuse business models offering home delivery, pick up, and/or return services have continued to operate smoothly, with some even thriving during the pandemic. Companies such as Loop and Vessel, that offer reusable containers to customers, have for example experienced their biggest surge in demand during the pandemic months.[21] Another example is Algramo, a provider of reusable packaging refill systems on-the-go, which has thrived during lockdown thanks to its no-customer-touchpoints tricycle distribution system across Santiago, Chile.[22] Sales increased by 356% between April and June, all the more impressive considering that the city of Santiago has been in a military-enforced lockdown. It seems that only one type of reuse model, 'refill-on-the-go',[23] has been challenged during the pandemic, with a shift towards disposables in some cases. These include the use of reusable shopping bags and bring-your-own cups and containers in the food service sector. However, even with this surge in disposables, these models have been shown to be resilient. Systems have been reconfigured to limit contact between people and clear public guidance has been offered on how to continue the safe use of reusables.[24]

Algramo, a provider of reusable packaging refill systems on-the-go, experienced a sales increase of **356%** between April and June 2020

6 Plastic collection, sorting, and recycling infrastructure

to circulate materials and design out waste and pollution

Collection, sorting, and recycling infrastructure offers an attractive investment opportunity to scale up high-quality materials circulation and enable a secondary market. An economic recovery can be shaped to decouple plastic packaging use from the consumption of fossil-based feedstocks and keep plastics out of oceans and soils, while also meeting climate targets.

High-quality recycling processes within Europe could supply up to **60–70%** of the material input needed for plastics production

Investments in physical infrastructure and technology upgrades are needed to radically improve recycling economics, quality, and uptake. In 2016, the global share of mismanaged plastics was around 41%, and has been projected to increase to 56% in 2040, contributing to almost tripling the annual volume of plastic entering the ocean.[25] Part of this has to do with the fact that a substantial share of global plastic waste today is still left uncollected, while a share of collected waste ends up directly being dumped into the environment. To help increase well-managed collection rates, investments in rural areas will particularly be needed since they represent 45% of uncollected waste and account for a similar share of plastic leakage into the ocean. For middle-/low-income countries, where funding is less available but whose informal sector plays an essential role in the collection of 59% of all plastic recycled globally, investing in the formalisation of the sector could increase the value of after-use plastic packaging and reduce the likelihood for material leakage.[26]

When it comes to sorting and recycling processes, only 35–40% of the virgin material value of plastics collected for recycling is currently retained for a next use cycle, (due to significant losses during processing) indicating the need to complement efforts to increase the collection rates with actions to drastically improve recycling yield, quality, and economics.[27] This will require directing investments towards the scale-up of sorting and recycling processes, while making use of the latest technology upgrades—such as advances in process control, chemical marking technologies, and automation. However, the ability to create high-purity after-use streams at competitive prices will largely depend on packaging and material design; an essential upstream measure that can help unlock the full potential of recycling and reprocessing efforts. The Ellen MacArthur Foundation's 2017 report, *The new plastics economy: catalysing action*, has estimated that by leveraging such measures, together with packaging designed for recirculation, recycling

A comprehensive circular economy approach could reduce the global annual volume of plastics entering our oceans by over **80%**, generate savings of **USD 200 billion** per year, reduce GHG emissions by **25%**, and create **700,000** net additional jobs by **2040**

economics could be improved by around USD 190–290 per tonne collected, or USD 2–3 billion annually across OECD countries.[28] To tap into such benefits, investments of at least USD 150 billion will be required in collection and reprocessing over the next five years alone to ensure that the plastics we do need can be circulated.[29] This has led many, such as the Polyolefin Circular Economy Platform (PCEP), to call for investment decisions—taken as part of recovery packages—to contribute to shaping forward-looking infrastructure that will accelerate the transition to a circular economy.[30] However, without significant action on elimination and redesign these costs would be significantly higher.

Packaging design in particular has a direct and significant impact on the economics of recycling. Without fundamental redesign and innovation, about 30% of plastic packaging will never be reused or recycled, and non-recyclables entering the recycling streams result in additional net costs. As an example, opaque PET bottles, that are difficult to recycle, add an estimated USD 1–2 million a year in avoidable costs to the French recycling system.[31]

Policymakers are increasingly turning their attention towards policies that improve recycling economics and support the creation of markets for recycled plastics. In the EU, for example, a new tax on non-recyclable plastic packaging waste (EUR 0.80 per kilogramme or EUR 800 per tonne) will be introduced as of 1st January 2021, with the ambition to increase recycling rates.[32] However, the effectiveness of the measure in tackling the systemic issue is still being debated.[33] Other actions taken prior the pandemic include the EU Strategy for Plastics in the Circular Economy, with the ambition to increase sorting and recycling capacity fourfold by 2030. The new EU Circular Economy Action Plan contributes to this by mobilising policies that: improve product design towards reuse and recyclability, reduce complexity of packaging materials, boost the recycled content of products, improve separate collection of plastic waste, and reduce single-use plastics where necessary.[34]

Investments in recycling infrastructure can also offer opportunities to address climate change and create additional jobs. A study by Material Economics showed that scaling high-quality recycling processes within Europe could supply up to 60–70% of the material input needed for plastics production, approaching the recycling levels for aluminium today.[35] With recycling saving around 90% of the CO_2 emissions arising from new production, this can have a significant impact.[36] Not only do these technologies help us to meet our climate targets, but they can also create jobs in higher income economies. According to some studies, on a per-tonne basis, the processing of recyclables alone can sustain about 20 times more jobs than landfill, and plastic manufacturers making use of recycled materials, about 100 times more jobs than landfill.[37]

For the world's emerging and lower income cities, investments in after-use infrastructure offer much needed economic and societal opportunities. Around the world, an estimated 15–20 million waste pickers earn a living from the informal collection, sorting, and recycling of discarded items.[38] Worldwide, they may even be responsible for collecting more plastic for recycling than the formal sector, accounting for 15–20% of collection globally.[39] For two-thirds of waste pickers, these earnings are the main source of household income, with more than three-quarters of them having formal businesses as their main buyers.[40] However, the pandemic has made informal communities particularly vulnerable, facing unprecedented threats to their health, safety, and livelihoods. Their health has been jeopardised, due to limited access to healthcare, hygienic necessities, and protective equipment and their jobs threatened, due to temporary shutdown of recycling centres. As such, investing in and formalising this sector could offer huge opportunities to keep materials in circulation, while also improving sanitary conditions and alleviating poverty.

When it comes to tackling plastic pollution, however, focusing on collection, sorting, and recycling alone will not be enough. According to the July 2020 report developed by The Pew Charitable Trusts and SYSTEMIQ called *Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution*, applying a strategy that focuses solely on recycling—including an ambitious design for recycling coupled with a scale-up of collection, sorting, and recycling infrastructure—would still result in "18 million metric tons of plastic flowing into the ocean each year by 2040".[41] The latter would cost governments USD 250 billion more than if an integrated system-level approach was taken (see paragraph below) between 2021 and 2040.[42] Therefore, any solution based solely on waste management and recycling is highly unlikely to succeed in stopping plastic pollution—as it will neither be technically nor financially feasible. A comprehensive circular economy for plastic is needed, in which it never becomes waste or pollution.

An integrated approach is needed that deploys both upstream and downstream solutions to effectively tackle plastic pollution. This includes the global implementation of multiple synergistic system interventions by industry and government such as the elimination of problematic and unnecessary plastic packaging, switching from single-use to reuse models, scaling waste collection, sorting and recycling, and substitution to other materials where relevant. Compared with business-as-usual, such a comprehensive circular economy approach has the potential to reduce the annual volume of plastics entering our oceans by over 80%, generate savings of USD 200 billion per year, reduce greenhouse gas emissions by 25%, and create 700,000 net additional jobs by 2040.[43]

To catalyse change towards such an integrated approach, collaboration across sectors and regions are needed that is driven by a shared sense of direction. It is for this reason that the New Plastics Economy initiative has spent the last four years rallying businesses and governments behind its common vision of a circular economy for plastic. Today, this vision unites more than 850 organisations across the plastics value chain, public and private sectors through the New Plastics Economy Global Commitment and Plastics Pact network.[44] These initiatives drive collective action to eliminate the plastic we don't need, to innovate so that all plastic we do need is reusable, recyclable, or compostable, and to circulate all the plastic we use, keeping it in the economy and out of the environment.

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Charity Registration No.: 1130306
OSCR Registration No.: SC043120
Company No.: 6897785