

# Why consider a circular economy?

A circular economy is defined as an upgraded model for goods production, consumption and disposal that ensures sustainable growth over time. Right now, the world operates in what is called a linear economy, a model that can have significant negative impact on our world.<sup>1</sup> Follow along below to learn more about how we operate today, how we can operate tomorrow, and the potential investment opportunity a circular economy offers investors.



<sup>1</sup>The linear economy, sometimes referred to as the take-make-waste economy, is a system in which resources are extracted to make products that eventually end up as waste and are thrown away.

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## Consequences of a linear economy

These are the consequences of our current linear economy, which operates on a framework that is resource intensive and not sustainable.



### 500 billion tonnes of materials

were consumed over the past six years.<sup>2</sup>



### 7 billion tonnes of plastic waste

have been generated globally, with less than 10% having been recycled.<sup>3</sup>



### 1 billion meals

a day are lost or wasted globally.<sup>4</sup>



### Millions of tonnes of clothes

are produced, worn and thrown away each year. Every second, the equivalent of a rubbish truck load of clothes is burned or buried in landfills.<sup>5</sup>

The circular economy wants to change this by designing and producing goods in a way that creates no waste or pollution in the first place, keeps them in use for longer, provides for efficient recycling and regenerates the natural environment. This sustainable economic system could yield enormous environmental, social and economic benefits across the world.

The Ellen Macarthur Foundation identifies major benefits of the circular economy including, but not limited to, the below:<sup>6</sup>

↓ **7.4MM**

tonnes of GHG emissions reduced<sup>6</sup>

↓ **32%**

reduction in material use of primary material consumption<sup>6</sup>

↓ **80%**

reduction in ocean plastic waste to protect biodiversity and human health by 2040<sup>6</sup>

↑ **\$4.5T**

economic opportunity by 2030<sup>6</sup>

↑ **18MM**

net new jobs could be created by 2030<sup>6</sup>

<sup>2</sup>The Circularity Gap Report 2024, <https://www.circularity-gap.world/2024#download>.

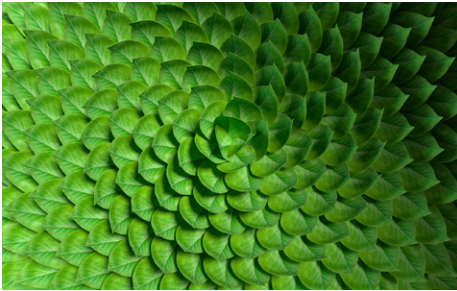
<sup>3</sup>UNEP, <https://www.unep.org/interactives/beat-plastic-pollution/>.

<sup>4</sup>World Food Programme, <https://www.wfp.org/stories/5-facts-about-food-waste-and-hunger>.

<sup>5</sup>Ellen Macarthur Foundation, <https://www.ellenmacarthurfoundation.org/topics/fashion/overview>.

<sup>6</sup>The Circular Economy in Detail: Deep Dive, Ellen Macarthur Foundation, available at: <https://www.ellenmacarthurfoundation.org/the-circular-economy-in-detail-deep-dive>.

# How can we make circular economy a reality?



## Investing in the circular economy

Opportunities to invest in the circular economy are also growing rapidly as more companies, governments and consumers are motivated to find new business models, policies and consumption patterns that support a more circular economy.

The public equity markets offer the opportunity to invest directly in funds targeting environmental solutions or in investment strategies that take sustainability or environmental, social and governance (ESG) factors into consideration. Public debt markets offer municipal bonds that finance infrastructure supporting water, recycling and waste, as well as Green bonds, which support sustainability-related projects.

In the private sector, venture capital helps fund early-stage companies that are developing innovative technologies or services to advance the principles of a circular economy. Private equity funding is critical as companies mature from early-stage entrepreneurship and need to scale their products or services offerings.

## Redefine waste

The current linear economy leaves a long trail of waste, starting with byproducts and emissions from the manufacturing process itself, carried on by single-use packaging and ending with a discarded, often underutilized, finished product in a landfill. Roughly 80% of a product's environmental impact is influenced by decisions made at the design stage, so the circular economy seeks to design out waste from the start and create "closed loops" to keep materials flowing through the system.<sup>7</sup> A closed-loop system reuses byproducts as future inputs, runs on renewable energy and sources from recycled materials. The shorter or tighter a loop, the better, because it typically yields the most savings by reducing costs, such as labor and energy.

In a circular economy, many industries will transition to service-oriented/sharing models from the prevailing asset ownership models. In the case of autos, this shift could significantly increase the efficient use of resources (fewer cars per capita need to be produced, saving raw materials and fuel) while also reducing pollution.

The environmental benefits are significant—relative to production, remanufacturing uses 80% less energy, 85% less water, 92% less chemical products and 70% less waste.<sup>8</sup>

## Retaining value from repairing to recycling

Extending the useful life of products also combats underutilization. To that end, there is a push to have producers and consumers:

### Repair

Figuring out ways to maintain products, rather than quickly discarding them or even recycling them, offers the highest value.

### Reuse

Product reuse and redistribution is viewed as the next best option to maintaining existing products.

### Refurbish

Repair and/or replace failed parts so a product can remain in use.

### Recycle

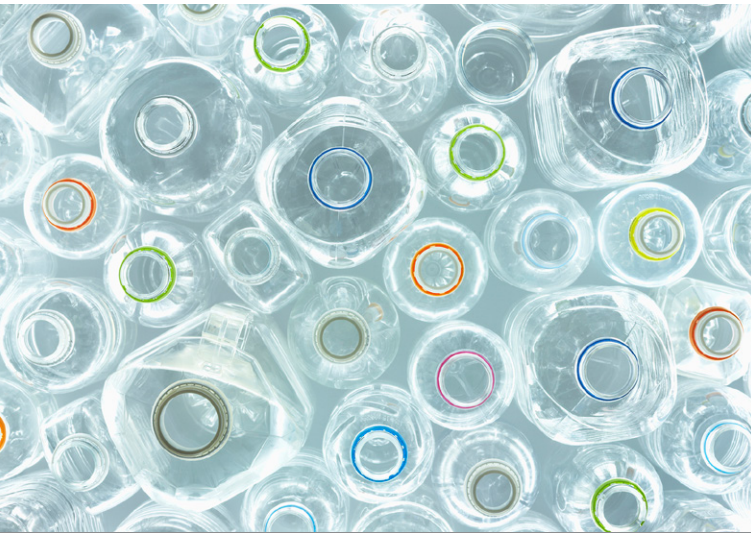
Investment in innovative technologies and processes is helping many companies incorporate recycling and recycled materials into their production.

<sup>7</sup> BCG <https://www.bcg.com/publications/2023/six-strategies-to-lead-product-sustainability-design>.

<sup>8</sup> Europe's first circular economy factory for vehicles: Renault, Ellen MacArthur Foundation, available at: <https://ellenmacarthurfoundation.org/circular-examples/groupe-renault>.

## Life in a circular economy

Perhaps the best way to describe what a circular economy might look like and why it would be beneficial is through a few examples. In this section, we take a look at the principles of a circular economy applied to the fashion and food industries.



### Plastics: A hundred-billion-dollar opportunity to reuse and recycle

Global companies, from retailers to plastics manufacturers, are setting high targets for plastics recycling, recycled and recyclable content, and recovery. For example, Sealed Air has pledged to make its packaging solutions 100% recyclable or reusable by 2025. The company has also set a goal of 50% average recycled content across all packaging solutions, of which 60% is post-consumer recycled content.<sup>9</sup> One of the drivers of these goals is the unsustainable practice of shipping plastic waste overseas, whereby developed countries are exporting shipping containers of plastic to developing countries, mostly in Asia.

Demand for recycled plastics is expected to nearly double by 2032, resulting in a market size of US\$107 billion globally.<sup>10</sup> Many companies with technologies to recycle used plastic into new plastic are operating pilot and commercial scale plants today, and will partner with larger firms and investors to develop and scale their technologies.<sup>11</sup> For example, LyondellBasell, ExxonMobil and Cyclx invested in a first-of-its-kind, US\$100 million plastic waste sorting and processing facility with this goal.

Reuse will also be essential to meeting the challenge of eliminating single-use packaging, as it requires less energy consumption and brings less complexity than recycling. Globally, replacing 20% of single-use plastic packaging with reusable alternatives is estimated to be a US\$10 billion opportunity.<sup>12</sup>

<sup>9</sup> The SEE® Impact Report, available at: <https://www.sealedair.com/sustainability/corporate-responsibility-esg?secureweb=WINWORD#:::text=Commit%20to%20design%20or%20advance.and%20infrastructure%20all%20by%202025>, July 2024.

<sup>10</sup> <https://www.fortunebusinessinsights.com/recycled-plastic-market-102568>.

<sup>11</sup> <https://www.closedlooppartners.com/what-is-chemical-recycling-why-does-it-have-so-many-different-names-and-why-does-it-matter/>.

<sup>12</sup> <https://www.ellenmacarthurfoundation.org/plastics-and-the-circular-economy-deep-dive#:::text=Globally%2C%20replacing%20just%2020%25%20of.in%20circulation%20in%20the%20economy>.



## Not-so-fast fashion

Waste is a severe problem across the fashion industry. For every five garments produced, three end up in a landfill or are incinerated annually.<sup>13</sup> Total greenhouse gas emissions from textiles production are 1.2 billion tonnes a year, equating to more emissions than those emitted by all international flights and maritime ships.<sup>13</sup>

If the fashion industry were to address the environmental and social issues it faces by taking steps such as converting to a sustainable material mix, eliminating harmful chemicals, decreasing water use, and improving transparency and traceability, it could unlock a US\$560 billion economic opportunity.<sup>14</sup> If not, fashion brands could face significant threats, including declines to profit margins.<sup>15</sup>

Innovators across the industry can and are finding ways to reduce waste. For example, many are seeking to:

- Reduce resources used, including raw materials as well as water and energy sources, in the manufacturing process. Patagonia is a leader in sustainable fashion, and 98% of its clothing line incorporates recycled materials; and brands such as Nike focus on low-impact material production.<sup>16,17</sup> They are implementing and scaling new design and manufacturing processes, with materials reclaimed throughout production and at the end of a product's life.
- Focus on the traceability of materials so companies can meet recycling standards. One innovative company has developed a chemical regeneration technology to transform post-consumer cotton garment waste into high-quality, cellulosic fiber.<sup>18</sup>
- Increase the durability of clothes, and the ability to repair them, as well as create secondary markets.

<sup>13</sup> <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-fast-fashion>.

<sup>14</sup> <https://www.ellenmacarthurfoundation.org/fashion-and-the-circular-economy-deep-dive#:~:text=By%20moving%20to%20a%20circular,keep%20safe%20materials%20in%20use>.

<sup>15</sup> <https://www.forbes.com/sites/rosecelestine/2023/07/10/shein-and-prettylittlething-fast-fashion-backlash-how-to-build-trust-through-esg/>.

<sup>16</sup> <https://www.patagonia.com/hidden-cost-of-clothes/>.

<sup>17</sup> <https://www.nike.com/sustainability/services>.

<sup>18</sup> <https://www.closedlooppartners.com/wp-content/uploads/2023/03/Closed-Loop-Partners-Impact-Report-2022.pdf>.

# Circular city

Cities have tremendous power to drive change toward more circular, closed-loop systems. Some of the ways cities can improve their efficiency and quality of life are to:



## Electric-powered vehicles

Reduce the need for vehicles (and shift to electric-powered ones) by improving public transportation and bicycle infrastructure within cities.



## Circular building kit

Redesign the way we construct building to make more efficient use of resources and energy. A circular economy could reduce global CO<sub>2</sub> emissions from buildings materials by 38% in 2050.<sup>19</sup> The Circular Building Toolkit recommends a number of strategies, including build nothing, build long-term value, build efficiently and build with the right materials.<sup>20</sup>



## Renewable energy

Use renewable energy, including bioenergy that can be recycled from food and other organic waste. In Amsterdam, it was found that using biorefineries, waste separation and return logistics could lead to an added value of US\$150 million, as well as 900,000 tonnes of material savings and a reduction of 600,000 tonnes in CO<sub>2</sub> emissions annually for the city.<sup>21</sup>



## Water conservation

Improve water conservation and treatment systems to conserve water within city limits. Recovering energy in the wastewater sector can actually offset the energy required for treatment. A Hungarian-based company, Biopolus, has created a modular urban water treatment system to harness clean water, energy, nutrients and minerals from wastewater and organic waste.<sup>22</sup>

**While the obstacles to a transition to a circular economy are numerous, so are the opportunities and potential benefits to our world.**

It will take a strong partnership between individuals, businesses and governments to make the circular economy a reality. If successful, this transition could be a multitrillion-dollar opportunity that brings a 40% reduction in greenhouse gas emissions.<sup>23, 24</sup>

<sup>19</sup> Built Environment, Ellen Macarthur Foundation, available at: <https://ellenmacarthurfoundation.org/topics/built-environment/overview>.

<sup>20</sup> d. Hub Circular Buildings Toolkit, ARUP & Ellen Macarthur Foundation, available at: <https://ce-toolkit.dhub.arup.com/strategies>.

<sup>21</sup> Ellen Macarthur Foundation, "Urban Biocycles," as of March 2017.

<sup>22</sup> Effective water systems for urban circularity: Biopolus, Ellen Macarthur Foundation, available at: <https://ellenmacarthurfoundation.org/circular-examples/effective-water-systems-for-urban-circularity>.

<sup>23</sup> <https://www.closedlooppartners.com/10-years-of-building-the-circular-economy-the-opportunity-of-catalytic-capital/>.

<sup>24</sup> <https://www.deloitte.com/global/en/about/press-room/global-circularity-still-in-decline-circular-economy-megatrend.html>.

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