# Circular Economy: Sustainability Challenges and Benefits




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In recent decades, the world's population and economy have grown exponentially, resulting in increased consumption of natural resources and an increase in waste production. The traditional linear economy, based on the "take-make-dispose" model, is no longer sustainable. A circular economy is an alternative to the linear economy that aims to reduce waste and conserve resources by keeping products and materials in use for as long as possible. There are many challenges and benefits associated with transitioning to a circular economy.

## What is a Circular Economy?

A circular economy is an alternative to the traditional linear economy, where resources are used, discarded, and replaced. Under a circular economy, products and materials are kept in use for as long as possible, then recycled or composted at the end of their life.

The concept of a circular economy has been around for a long time, but it's only recently that the idea has begun to gain traction. The primary reasons for this are:

- The world is facing a waste crisis. We're producing more and more waste each year, but we don't have the infrastructure to deal with it.
- Climate change is making it increasingly urgent to find ways to reduce our greenhouse gas emissions. The linear economy is a major contributor to climate change, so transitioning to a circular economy is critical if we want to meet our climate goals.

The circular economy is based on three principles: reduce, reuse, and recycle. It's important to reduce waste by designing products that use fewer resources and can be reused or recycled. Reusing products saves energy and reduces the need for new materials. Recycling is the last resort for products that can't be reused.

There are many benefits to the circular economy. It's better for the environment because it reduces greenhouse gas emissions and helps conserve resources.

The circular economy is already being implemented by some businesses and governments worldwide. In the Netherlands, for example, a company called Closing the Loop manufactures recycled plastic products. The company has developed a process that converts used plastic into new products, such as flooring, decking, fencing, and park benches. This helps keep plastic out of landfills and oceans while providing jobs in the local community.

# Principles of the Circular Economy Model

A circular economy is based on three core principles: eliminate waste and pollution, circulate products and materials, and regenerate nature.

## Eliminate Waste and Pollution

To encourage circular economy practices, the first step is to prevent wasting. In the marketplace today, we work in a take-make-waste structure, as raw materials are taken from the Earth, raw materials are turned into other items, and then discarded as waste. Much of that waste ends up in landfills or incinerators and is lost. This defective waste management system cannot last indefinitely as our

resources are limited.

Many of our products are designed to be disposable. A lot plastic packaging, for example, is not designed for reuse and cannot be recycled or composted, so waste is built in. And much of what we've created on this planet has been designed without considering what happens at the end of its life cycle.

Companies like Apeel are working to solve the problem. They eliminate single-use shrink wrap plastic on fresh produce by producing an edible, plant-based covering that is applied to the produce. It works to protect fruits and vegetables by enhancing their natural defense systems, preventing the need for plastic covering, and allows them to last up to three times longer, also tackling the food waste issue.

Companies like Lush are simply removing product packaging – selling "naked" products without the need for containers and plastic. Selling liquid products in solid form reduces the amount of trash in landfills.

Packaging, however, isn't the only thing to worry about when it comes to waste and pollution. DyeCoo, a textile company, has invented a technology that dyes fabric without water, thereby removing toxic wastewater. Though the technological investment comes at a higher cost than traditional dying equipment, the company has reduced operating costs in other ways, with shorter batch cycles, more efficient dye use, minimizing worker exposure to toxic chemicals, and avoiding wastewater treatments.

## Circulate Products and Materials

Materials need to remain in use as long as possible, either as the product itself or as the components or raw materials. Doing so means that nothing is wasted and everything retains its intrinsic value.

There are several ways to keep products and materials in circulation – mainly the technical and biological cycles.

The technical cycle ensures products are repaired, reused, remanufactured, and recycled. It's common with smartphones, computers, and other electronics. Instead of buying brand new, consumers can purchase refurbished versions of the same product at a discount and reduce their waste.

When a product is broken and no longer of use, it can be broken down into parts that can be retooled or recycled for use in other products.

With the biological cycle, biodegradable materials break down and return to the earn through anaerobic digestion and composting.

Some products, such as wooden furniture and cotton clothing, can move through both the technical and biological cycle, maintained, repaired, and reused until they return to the biological cycle they came from in the first place, feeding the soil to grow more wood or cotton.

## Regenerate Nature

THe final principle is to regenerate nature. When we shift to a circular economy, we support natural processes that allow our natural environment to thrive. From farming practices designed to rebuild soil, promote increased biodiversity, and return biological material to the earth, we no longer deplete the soil of nutrients.

In nature, there is no waste. As a leaf falls from a tree, it serves to feed the forest, and the cycle has continued this way for billions of years.

The food industry is the best place to start here, since healthier soil will grow food with fewer greenhouse gas emissions, hold more water, and absorb, instead of releasing carbon. When we restore the natural ecosystem, our planet can take care of itself better.

And as we reduce the amount of waste we're producing, we can save the land space we currently use to hold the waste for more renewable energy and renewable resources.

> *A circular economy is vital to protect our environment, but requires cooperation from consumers, governments, and businesses alike.*

# Benefits of a Circular Economy

Though shifting from a linear to a circular economic model won't happen overnight, it comes with numerous benefits policymakers need to consider.

## Supports Economic Growth

A circular economy is not only more sustainable but also more efficient. It cuts waste and boosts recycling rates. And it does all this while creating more jobs than a linear economy. A study by the Ellen MacArthur Foundation found that a circular economy could create up to 1.5 million jobs in the European Union alone.

## Reduces Environmental Impacts

The study also found that if the world moved to a circular economy, it could reduce greenhouse gas emissions by up to 60 percent and save $1 trillion annually by 2030. The benefits would be far-reaching, extending beyond emissions reductions to include improved resource efficiency and reduced waste.

## Saves Your Business Money

By adopting circular business models, your company builds cost savings. Though the initial capital investment to start these initiatives may hit the bank a little harder than you'd like, ultimately, the circular economy principles of reducing waste and pollution, keeping as much in use as possible with recycled materials, and working toward renewable energy and resources help to save money. Your systems become more efficient, reduce the negative byproducts of your operations, and create optimized business processes throughout the value chain that keep everything running like a well-oiled machine.

## Builds Customer Loyalty

Today's customers are more eco-conscious than ever before, wanting to do their part to protect the environment. When you implement circular strategies that support sustainable development, your customers will appreciate the effort you're making. They'll be more likely to shop with you, and share your brand with their friends and family. As customers demand more sustainable resource use, you can be ahead of the game when it comes to meeting changing consumer needs. You'll strengthen your brand's reputation as an innovative leader, too.

## Strengthens Your Supply Chain

As more companies invest in environment and social governance (ESG) initiatives,

you'll find that creating a closed loop system minimizes resource inputs, while reducing emissions and waste. This translates to stronger supply chain security and pricing, which reduces volatility. With circular procurement, you support a sustainable circular economy.

# Challenges of a Circular Economy

## Circular Doesn't Automatically Translate to Sustainable

Sustainablity is often used in conjunction with circular economonies, but having a CE doesn't mean you have something sustainable. Isolated things, such as electric vehicles, paper straws, and solar panels, aren't sustainable. Sustainablity is part of a system, rather than something focused on individual parts.

Electric vehicles aren't sustainable once you factor in the social and environmental impacts of the lifecycle of the lithium ion battery – and the lack of recycling and reuse options once it reaches end of life.

A CE buildes resilience against disruption from climate change, pandemics, etc, but must be enabled by sustainability. CE is a part of reaching sustainability, but that alone won't guarantee it. Just because something is circular doesn't mean that you will have positive social, environmental, and economic results.

## Many Places Lack Proper Waste Infrastructure

Close to 33% of plastics aren't collected by waste management systems and end up as litter. Case studies have found that there may be more plastic in the ocean than fish by 2050. This is a huge problem for developing countries that produce a lot of plastic, but lack the appropriate recycling and waste management systems.

## Government Regulations Can Create Waste

Sometimes, our government creates unintentional waste. It's commonly seen in the food industry, since expiration dates are legally required consumer protections. But, those dates may not account for how the food is stored. Eggs in Europe, for instance, are labeled for pantry storage, when they will last longer in

the refrigerator. The dates are often misunderstood so that people believe a food is no longer safe to eat, when in fact it is okay but may be lesser quality than the manufacturer's standards.

## Consumers' Expect Convenience

We use 20x the amount of plastic today than we did 50 years ago. Most of us couldn't live a waste-free lifestyle if we tried. It's much more convenient to buy prepackaged foods than it is to buy loose items in bulk and store them in containers at home. Single-use items like paper plates and plastic silverware are more convenient than having to constantly wash dishes. Relying on plastic bags at the grocery store is much easier than remembering to bring our own linen bags from home.

## We Need Better Recyling Technology

The majority of plastics recycled today are reprocessed for lower value applications – like polyester carpet fiber. Only 2% of products are recycled into something that's the same or similar in quality. This is mostly because of the fact that we're limited in how plastics can be sorted by chemical additives and cleaned. Better technology ensures that we can maintain purity and quality standards to make it easier to use recycled plastics.

## We Need to Change Business Models

Today's business models are focused on consumption – not reuse. Product design itself does little to think about what happens once a product reaches end of life. Until that changes, and we build recycling and reuse into every business model and force it to be part of the design, we will continue to struggle with our finite resources.

# Sustainability and Circularity Matter

The fact is that our finite resources will run out eventually. Without taking action to make real, sustainable change in as many aspects of our economy as possible, we're in trouble.

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