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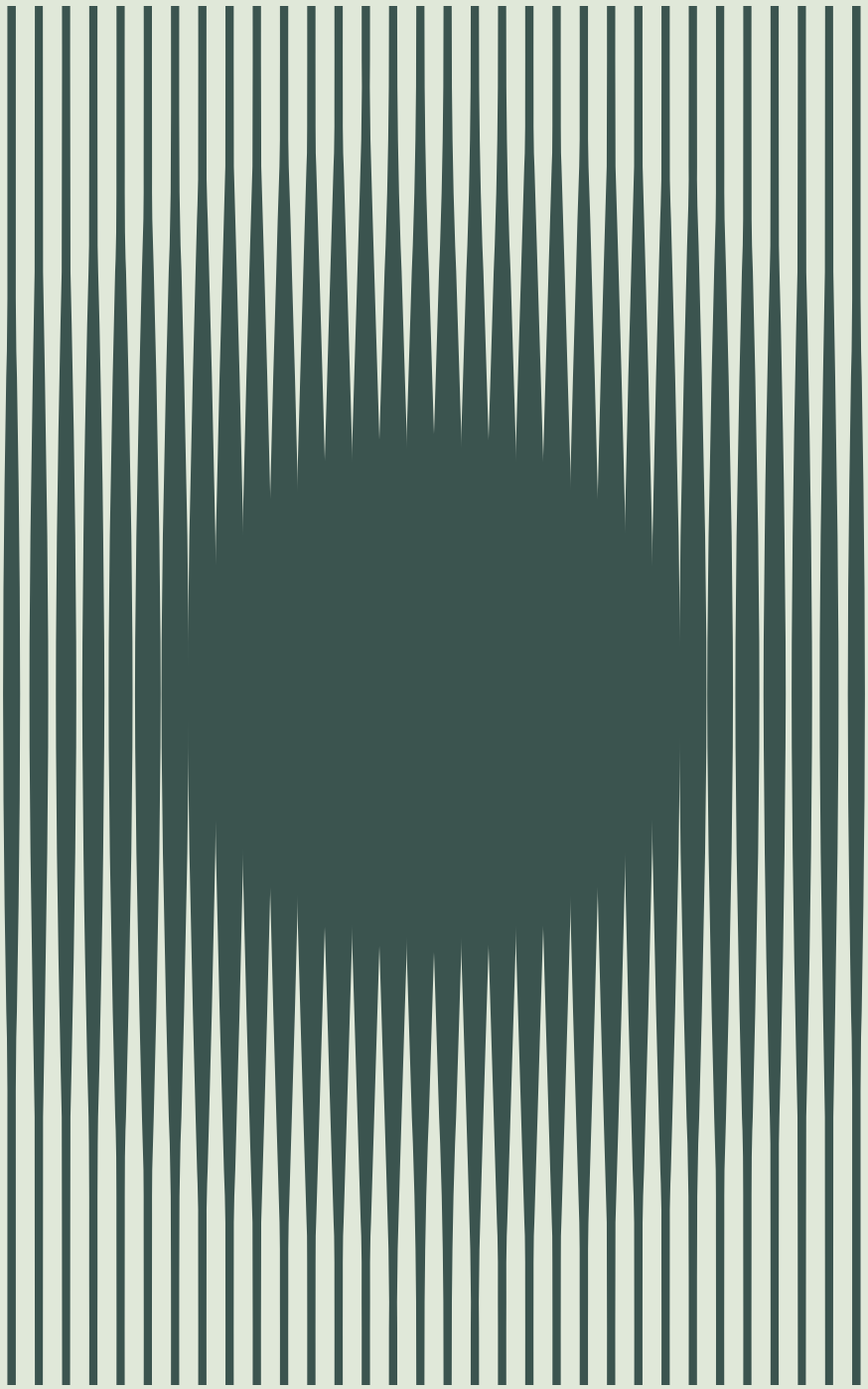
DESIGNING A CIRCULAR FUTURE

An Introduction to Circular Economy & Design



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CIRCULAR DESIGN

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/DEDICATION

To all designers, researchers, scientists and individuals who are working tirelessly to help the world in the transition to a circular future.

/ACKNOWLEDGEMENTS

Our massive thanks and appreciation to all the designers and companies that spent some time answering our interview for this e-book: Studio Ctt, Out For Space, Marie-Louise Hellgren, Ponto Biodesign, Enis Akiev, Kathryn Larsen, Woodio, Studio Flauer, Qwstion, Miyuca, Post Carbon Lab, Jiani Zeng, Pensieromateria, FormaFantasma and Philipp Hainke. We are so glad to be able to share your insightful thoughts and inspiring work with readers all over the world.

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"No man is an island."

John Donne - English Poet

/INTRODUCTION

THE FUTURE IS CIRCULAR

The Future is Circular, far from being only a catchy, intriguing motto, it is an assertion. The planet is urging us to re-design, re-think and re-purpose the way we produce and consume. The only possible future is indeed circular, and there is no turning back.

While working on this e-book and digging deep on the negative environmental impacts that our fast-pace linear economy has so far created, we were surprised by the global coronavirus outbreak. And then, again we asked ourselves: Why were we so surprised?

In a globalised and hyper-connected world, with a very fast-speed linear economy, climate change, the immigration crisis and economic recession, how come we still struggle to see that we are all in this together? After all, “no man is an island”.

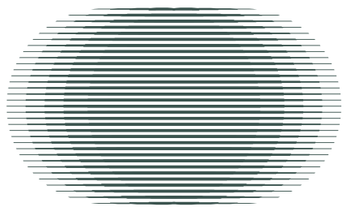
Earth is our home, our big massive island, we are all interconnected, and if tsunamis hit us all, not even the 1% mega-rich will be spared. They might be affected later than people in more vulnerable situations, and this is true for the coronavirus as it is true for the climate change crisis.

Since the beginning, our purpose with this e-book was to sparkle conversations about the circular economy and circular design to inform and inspire readers in the creation of a sustainable future. Now, more than ever, we see how this conversation is critical.

In this e-book, we will walk you through the logic of the linear economy versus the circular economy; the circular economy main principles, origins, definitions and positive impacts; the circular design strategies and role; case studies from European Design Fairs & Events and finally a series of exclusive interviews with emerging and talented designers and companies working with circular design principles.

"In nature, there is no landfill as there isn’t waste.”

Ellen MacArthur foundation



/SHIFTING FROM A LINEAR TO A CIRCULAR ECONOMY

UNDERSTANDING THE LINEAR ECONOMY

TAKE-MAKE-CONSUME-WASTE

We live in a world where the current economic system follows the "Take-Make-Consume- Waste" logic. This economic system is what we call "linear economy". We take resources from the ground to create products, we use these products, and when we don't want or don't need them anymore, we throw them away.

A linear approach to the economy, therefore, imposes very low or no value on resources and products.

The primary strategy to increase profit in a linear economy is to sell more products by keeping mass production costs as low as possible. As a result, we often have the precarization of work conditions, decrease of labour costs, less job creation and planned obsolesce.

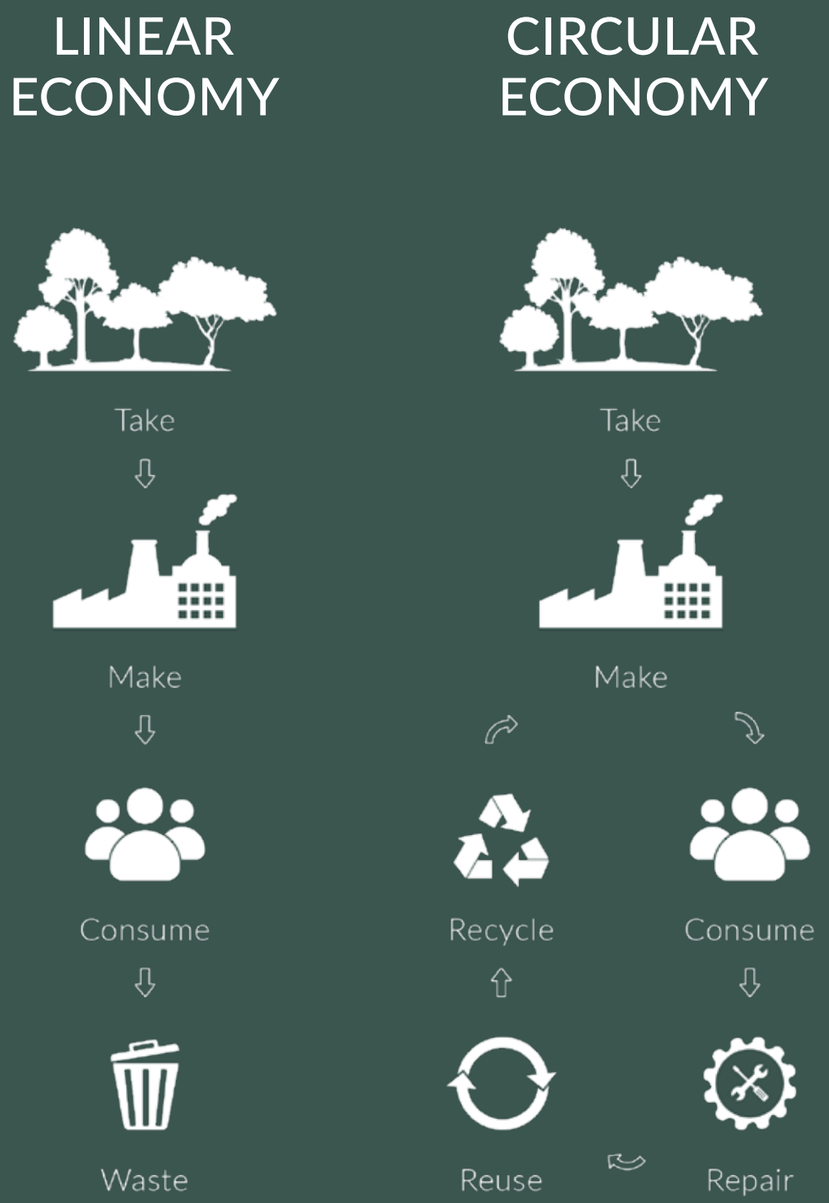
Products that are used, broken or obsolete are considered a burden to get rid of as soon as possible either through legalised waste disposal systems, illegal incineration or dumping. Most of the time repairing a product is usually more expensive than buying a new one as companies purposely design products to be obsolete after a short time (think about computers, mobile phones, washing machines just to name some).

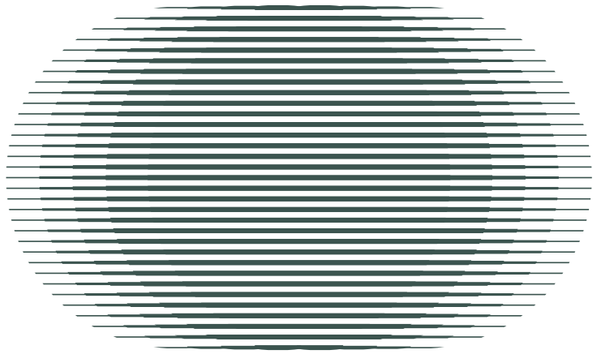
In other words, a technological innovation that turns used products into obsolete ones together with the lack of technical information and repair manuals create barriers to fixing products and push consumers to a never-ending upgrade linear cycle.

The global economy is consuming 100 billion tonnes of materials a year for the first time; however, the cycling rate of resources has gone into reverse. Of all the fossil fuels, minerals, metals and biomass that enter this cycle each year just 8.6% are cycled back. Every time a product starts a new cycle, energy and resources are consumed.[1] Thus slowing down the cycles, that is, increasing the longevity of products, must be considered. We need to raise the value of products, resources and waste. From electronics to clothes, from houses to furniture, from food to transports.

The current linear system is giving so many signs that its logic is no longer working for people, businesses and the environment. We must re-design our economy, shifting from a linear to a circular approach.

[1] *Circularity Gap Report 2020 Launched in 2020 by Circle Economy (Davos)*





To create a new circular economy that can benefit everyone within the limited resources of our planet, we must disrupt the linear system. We must re-design the "take-make-consume- waste" logic taking into consideration the management of resources, the making and usage of products, and the disposal of materials afterwards.

Nature is a great inspiration, and it is where we should start. Think about it, in nature; there is no landfill as there isn't waste. In other words, materials flow in circles, and one species waste is another species food. Things grow, die and return to the soil. Then the cycle begins again and is completely circular.

Humans, instead, live in a much linear “mode”, no wonder landfills are ever-growing and having all sorts of negative impacts on the planet. A circular approach to economy challenges us to incorporate the living world cyclical model where resources are kept in use for as long as possible and then retaken and regenerated at the end of their service life.

The circular economy breaks this challenge on three main principles[2]:

[2] www.ellenmacarthurfoundation.org

/SHIFTING FROM A LINEAR TO A CIRCULAR ECONOMY

TOWARDS A CIRCULAR ECONOMY 3 MAIN PRINCIPLES

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/PRINCIPLE 1

DESIGN OUT WASTE AND POLLUTION

Waste and pollution are no accidents; they are primarily designed. The decisions we make when designing a product, system or service will determine 80% of their environmental impact. If we acknowledge this and understand that waste is a design flaw, we can explore new materials and technologies to make sure waste and pollution are not created in the first place.

/PRINCIPLE 2

KEEP PRODUCTS AND MATERIALS IN USE

We need to raise the value of products and materials by keeping them in the economy. Products and components should be designed to allow reuse, repair, and remanufacture. When it comes to packaging and food, the solution is to get materials back, so they don't end up in a landfill.

/PRINCIPLE 3

REGENERATE NATURAL SYSTEMS

The circular economy not only tells us to protect the environment but also to improve it by taking nature itself as an example. In nature, there is no concept of waste, and everything is food for something else. Instead of only trying to do less damage, we should aim to do good. We can enhance our natural resources by returning valuable nutrients to the soil and other ecosystems.

"We need to make things to be made again."

Tim Brown - Designer and chair at IDEO

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/THE CIRCULAR ECONOMY

FROM CRADLE TO CRADLE TO THE BUTTERFLY DIAGRAM

Before diving deep into the circular economy world, let's take a step back and understand the origins of this concept. Although we can't trace back the circular economy concept to one single date or author, its practical applications have gained momentum since the late 1970s, led by some researchers, thought-leaders and businesses.

One of the design philosophies that have helped to refine and develop the circular economy concept was the so-called **Cradle to Cradle**. This design idea and process - created by German chemist Michael Braungart and American architect William McDonough, considers all material involved in industrial and commercial processes to be nutrients, either technical or biological nutrients.

Cradle to Cradle design, therefore, perceives the safe and productive processes of nature's 'biological metabolism' as a model for developing a 'technical metabolism' flow of industrial materials. Product components can be designed for a non-stop recovery and reutilisation as biological and technical nutrients within these metabolisms.

The **"Butterfly Diagram"**, a circular economy system diagram is heavily influenced by Cradle to Cradle school of thought. The diagram incorporates the flow of materials, nutrients, components, and products while adding an element of financial value.

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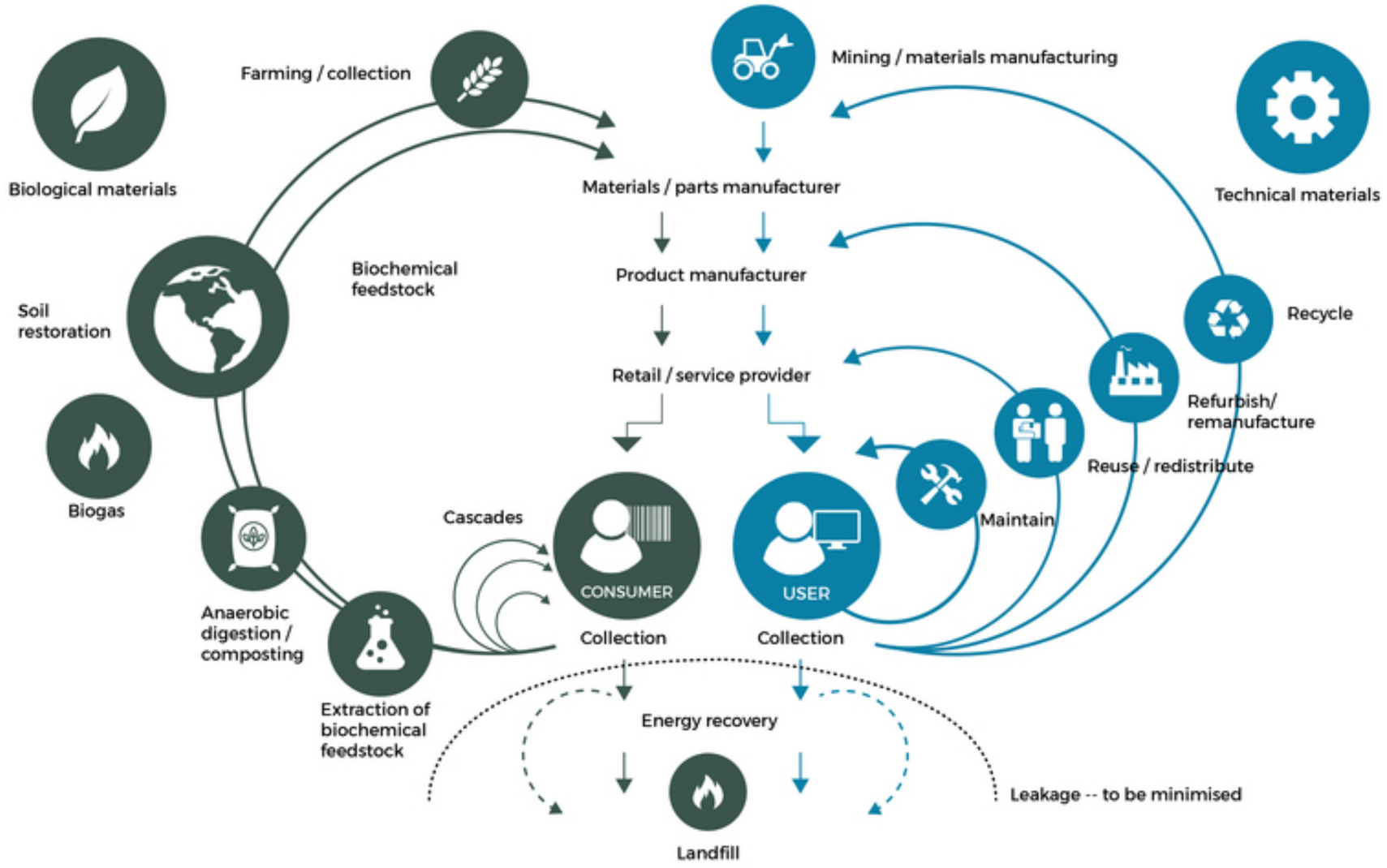
/THE BUTTERFLY DIAGRAM



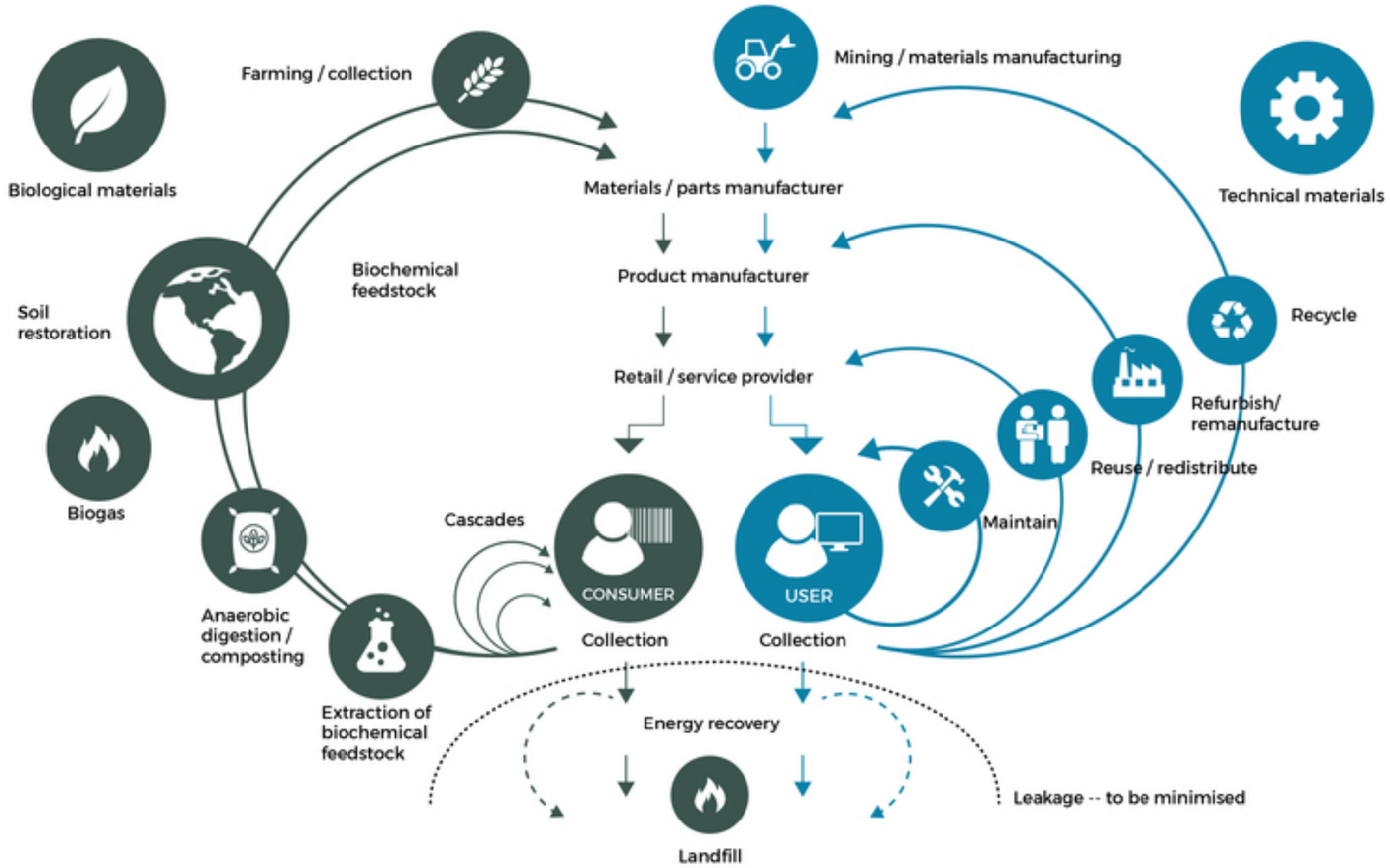
source - www.ellenmacarthurfoundation.org

When we look at the diagram, we can see a separation into two distinct cycles, which represent two different flows of material: a **biological flow and a technical flow.**

/BIOLOGICAL MATERIALS are represented in green cycles on the left side of the diagram. These are materials that can safely return to the natural world, once they have gone through one or more use cycles, where they will biodegrade over time, returning the embedded nutrients to the natural ecosystem.

/TECHNICAL MATERIALS, in turn, are represented in blue on the right-hand side and can't return to the environment. Materials such as metals, plastics, and synthetic chemicals, must always cycle through the system so that their value can be captured and recaptured.

When we understand the difference between biological and technical materials, we can then create design solutions to either bring nutrients back to the ecosystem or keep materials in use to avoid waste and pollution.



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/THE CIRCULAR ECONOMY

A NEW MINDSET
SHARING VS OWNING

The Butterfly Diagram help us reflect on our relationship to materials. It is clear by looking at the diagram that we don't consume electronics or cars in the same way we consume food. This clear distinction helps us to reflect on the differences between consumers and users. In a circular economy, biological materials are the only ones that can be understood as **consumable**, while technical materials are **used**.

The distinction between things that can be consumable and things that can be used raises questions about ownership. We start wondering if we really need to own products in the way we do in a linear economy.

For example, what is the need or benefit of owning a drill? We usually only need some holes in the wall to hang a frame, so why not sharing a drill instead of owning it?

The access to the service a product provides is what matters, rather than the product itself. Understanding this mindset shift helps to set the practical basis for the circular economy.

/THE CIRCULAR ECONOMY
AN ESSENTIAL GLOSSARY

In this section of our e-book, we want to go over some **essential definitions** and **concepts** that will help us further comprehend the circular approach to the economy and its benefits. And will also prepare us for our further discussion around circular design.

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FEW DEFINITIONS FROM THE BUTTERFLY DIAGRAM[4]

/INNER CIRCLES VERSUS OUTER CIRCLES APPROACHES[5]

Inner and Outer Circle approaches are strategies used to extended products lifecycle within the circular economy. You can visualise them in the butterfly diagram on the right side (technical flow). Reuse, repair, redistribution, refurbishment and remanufacturing are all considered inner circle approaches while recycling is regarded as an outer circle approach.

Inner circle approaches have a much higher circular benefit than outer circles, and this is due to losses during collection and processing, and degradation of material quality during recycling. Further to this, the mainstream of “outer circle" is hard for people to relate to a human scale, as it can be done most of the time by big corporations, for example, electronic companies.

The “inner circles” of repair and reuse is where we can approach a future economy on a human scale: making sure that products are more repairable and long-lasting by focusing on creating local opportunities for repair, reuse and refurbishment.

/MAINTAIN/PROLONG/ SHARE

Keeping products and materials in use is one of the main strategies to extend their lifecycle in a technical loop, and this can be achieved when things are designing for durability as well as maintenance and repair. Long-lasting products can then be shared among users who can get access to the service they provide, eradicating the need to create new products.

/REUSE/REDISTRIBUTE

Technical products and materials can also be reused various times and redistributed to new users in their original form or with little improvements.

/REFURBISH/REMANUFACTURE

Remanufacturing and refurbishment are two similar processes of restoring value to a product.

Remanufacturing a product means to disassemble it to the component level and rebuilt (replacing components if necessary) to as-new condition with the same guarantee as a new product. Refurbishing a product means to repair as much as possible, usually without disassembly and the replacement of components.

/RECYCLE

Recycling is the process of reducing a product to its basic material level, thus allowing those materials or a portion of them to be remade into new products. Recycling is a vital process in a circular economy; however, there is a lot of loss within this process. The loss of embedded labour and energy; the necessary costs to transform products completely and the inevitable material losses means that recycling is less efficient than reuse and remanufacturing, for example.

/CASCADES

Cascade is another loop within the biological cycle that refers to the process of putting used materials and components into different uses and extracting, over time, stored energy and material order. Along the cascade, this material order declines until the material finally needs to be returned to the natural environment as nutrients. A cascade, for instance, could be a pair of cotton jeans being turned into furniture padding and then into insulation material before being anaerobically digested so that it may be returned to the soil as nutrients.

[4] www.ellenmacarthurfoundation.org

[5] https://therestartproject.org/consumption/we-are-the-circular-economy/

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OTHER USEFUL DEFINITIONS TO KEEP IN MIND

/PRODUCT LIFE CYCLE

The product life cycle is a period over which a product is developed, brought to the market and finally removed from the market. When it comes to consumers, a product life cycle can be understood from the moment we buy something, use it and dispose of it.

/UPCYCLING

Upcycling is the process of transforming by-products, waste materials, or unwanted products into new materials or products of better quality and environmental value.

/DOWNCYCLING

Downcycling is the opposite of upcycling as it involves converting materials and products into new materials of lower quality.[6]

/BIODEGRADABLE MATERIALS

Biodegradable materials have the ability to break down by the action of microorganisms such as bacteria and fungi. Therefore biodegradation implicates action of microorganisms and occurs within landfills.

/COMPOSTABLE MATERIALS

Compostable materials have the ability to break down under special composting conditions to make fertiliser. Composting also involves the action of microorganisms and occurs in compost piles.

/BIOMIMICRY

Biomimicry is as a discipline that studies nature's greatest ideas and then mimics its designs and processes to solve human problems. It is basically 'innovation inspired by nature'. Biomimicry relies on three key principles: nature as model, nature as measure and nature as a mentor.[7]

/BIOFABRICATION

"Biofabrication literally means fabricating with biology", as fashion designer Suzanne Lee explains. In other words, instead of processing animals, plants or oil to develop materials, we should grow materials directly with living organisms such as bacteria, algae, fungi and yeast.

/BIODESIGN

Biodesign is the practice of designing with biology, and it goes further than the many biology-inspired approaches to design and fabrication. It refers specifically to the incorporation of living organisms or ecosystems as essential components, enhancing the function of the finished work. It goes beyond mimicry to integration, dissolving boundaries between the natural and built environments and synthesizing new hybrid typologies. This concept highlights experiments that replace industrial or mechanical systems with biological processes that tend to be more renewable while making fewer material and energy demands.[8]

[6] The terms upcycling and downcycling were first used in print in an article in SalvoNEWS by Thornton Kay quoting Reiner Pilz and published in 1994.

[7] Janine Benyus, Biomimicry: Innovation Inspired by Nature

[8] William Myers and Paola Antonelli, Biodesign: nature, science and creativity

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OTHER USEFUL DEFINITIONS TO KEEP IN MIND

/CARBON FOOTPRINT

A carbon footprint is historically defined as the total greenhouse gas (GHG) emissions produced by an individual, event, organization, services or products expressed as carbon dioxide equivalent.[9] Greenhouse gases, including the carbon-containing gases carbon dioxide and methane can be emitted through the burning of fossil fuels, land clearance and the production and consumption of food, manufactured goods, materials, wood, roads, buildings, transportation and other services.[10]

/ECOLOGICAL FOOTPRINT

Ecological Footprint measures how much nature we have and how much nature we use. In other words, how fast we consume resources and generate waste versus how quickly can nature absorb our waste and generate new resources. The Footprint helps countries, local leaders and individuals to better understand their negative impact on the planet and to reduce it.[11]

/SHARING ECONOMY

The sharing economy is a way of distributing goods and services that differs from the conventional model of businesses hiring employees and selling products to consumers. In the sharing economy, individuals rent or "share" things such as their cars, homes and personal time to other individuals in a peer-to-peer fashion.[12]

/SUSTAINABILITY

The word sustainability comes from the Latin verb “sustinere” which means to hold, to sustain, to endure.

Sustainability considers 3 pillars: economic, environmental, and social, also known as profits, planet, and people. Broadly speaking sustainability focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs.

/GREENWASHING

Greenwashing is the practice of making an unproven or distorted claim about the environmental benefits of a product, service, technology or company practice. Greenwashing is used to differentiate a company's product and service from its competitors, leading consumers to believe that this product or service is more environmentally friendly than it really is.

[9] www.carbontrust.com
[10] www.co2list.org
[11] www.footprintnetwork.org
[12] Hamari, Juho; Sjöklint, Mimmi; Ukkonen, Antti (2016). "The Sharing Economy: Why People Participate in Collaborative Consumption". Journal of the Association for Information Science and Technology.

/THE CIRCULAR ECONOMY

IMPACTS ON THE ECONOMY, BUSINESS, ENVIRONMENT AND INDIVIDUALS

Now that we have gone through the basics of the circular economy and several important concepts let's take a look at the practical impacts of shifting to a new economic model according to the Ellen MacArthur Foundation investigation.[13]

[13] www.ellenmacarthurfoundation.org

/THE CIRCULAR ECONOMY

THE ECONOMIC IMPACT

Business and government leaders are turning their attention to the circular economy to drive innovation, increase growth and create employment. The impact of a transition to a circular economy will be felt across the whole society and here are some of the macroeconomic benefits of this shift.

/INNOVATION - The aspiration to replace linear products and systems with circular ones is a huge creative opportunity. The benefits of a more innovative economy include greater rates of technological development, improved materials, labour, energy efficiency, and more profit opportunities for corporations.

/ECONOMIC GROWTH - Economic growth, as defined by GDP, would be accomplished mainly through a combination of increased revenues from emerging circular activities, and lower cost of production due to inputs effective utilisation. These changes in input and output of economic production activities affect economy-wide supply, demand, and prices. Its effects ripple through all sectors of the economy, adding to overall economic growth.

/MATERIAL COST SAVINGS - Based on detailed product-level modelling, it is estimated that, in the sectors of complex medium-lived products (such as mobile phones and washing machines) in the EU, the annual net-material cost savings opportunity amounts to up to USD 630 billion. For fast-moving consumer goods (such as household cleaning products), there is a material cost-saving potential of up to USD 700 billion globally.

/JOB CREATION POTENTIAL - The largest comparative study to date of the employment impacts of a circular economy transition points to “positive employment effects occurring in the case that the circular economy is implemented”.[14] This impact on employment is mostly due to increased spending fuelled by lower prices; high-quality, labour-intensive recycling activities; and higher-skilled jobs in remanufacturing. New jobs will be created across industrial sectors, within small and medium enterprises, through increased innovation and entrepreneurship, and a new service-based economy.

[14] www.sun-institute.org

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/THE CIRCULAR ECONOMY

ENVIRONMENTAL AND SYSTEM-WIDE BENEFITS

The circular economy means a powerful contribution to achieving global climate targets by designing out waste and pollution, keeping products and materials in use, and regenerating rather than degrading natural systems.

/LAND PRODUCTIVITY AND SOIL HEALTH - Land degradation costs an estimated USD 40 billion annually worldwide, without taking into account the hidden costs of increased fertiliser use, loss of biodiversity, and unique landscapes. Higher land productivity, less waste in the food value chain, and the return of nutrients to the soil will enhance the value of land and soil as assets.

Returning biological material into the soil will reduce the need for replenishment with additional nutrients. Recovering all of the nitrogen, phosphorus, and potassium from food, animal and human waste streams globally could contribute nearly 2.7 times the nutrients contained within the volumes of chemical fertiliser currently used. This is the circular economy principle of regeneration at work.

/CARBON DIOXIDE EMISSIONS - For Europe, a circular economy development path could halve carbon dioxide emissions by 2030, relative to today's levels across mobility, food systems, and the built environment. Besides, sector-specific analysis indicates that the UK could reduce greenhouse gas emissions by 7.4 million tonnes per annum by keeping organic waste out of landfills.

/PRIMARY MATERIAL CONSUMPTION - The circular economy could result in a reduction of primary material consumption (i.e. car and construction materials, real estate land, synthetic fertiliser, pesticides, agricultural water use, fuels, and non-renewable electricity) by 32% by 2030.

/THE CIRCULAR ECONOMY

THE OPPORTUNITY FOR COMPANIES

Businesses would benefit significantly by shifting their operations in line with the principles of the circular economy.

/IMPROVED CUSTOMER INTERACTION AND LOYALTY - New business models, such as rentals or leasing contracts, establish longer-term relationships.

These business models offer companies the chance to gain insights into usage patterns that can lead to improved products, better service, and higher customer satisfaction.

/PROFIT OPPORTUNITIES - Analysis of complex medium-lived products (e.g. mobile phones) and fast-moving consumer goods (e.g. household cleaning products) shows that the circular economy would support the following improvements:

- The cost of remanufacturing mobile phones could be reduced by 50% per device;
- High-end washing machines could be leased instead of sold – customers would save roughly a third per wash, and manufacturers would earn approximately a third more in profits.

/REDUCED VOLATILITY AND GREATER SECURITY OF SUPPLY - The shift to a circular economy means using less virgin material and more recycled inputs, reducing a company's exposure to ever more volatile raw materials prices and increasing resilience. The threat of supply chains being disrupted by natural disasters or geopolitical imbalances is reduced.

/NEW DEMAND FOR BUSINESS SERVICES - A circular economy would create demand for new business services, such as:

- Collection and reverse logistics companies that support end-of-use products being reintroduced into the system;
- Product remarketers and sales platforms that facilitate more prolonged use of products
- Parts and component remanufacturing, and product refurbishment offering specialised knowledge and service.

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/THE CIRCULAR ECONOMY

THE OPPORTUNITY FOR INDIVIDUALS

The benefits for individuals of a system based on the principles of circularity are significant, ranging from increased disposable income to improved living conditions and associated health impacts.

/HEALTH - Shifting to a circular food system could lower the healthcare costs associated with pesticide use by USD 550 billion globally. There would also be significant reductions of antimicrobial (an agent that kills microorganisms or stops their growth) resistance, air pollution, water contamination, and foodborne diseases. It is estimated that a circular economy for food, catalysed by cities, could save 290,000 lives otherwise lost to outdoor air pollution per year, by 2050.

/INCREASED DISPOSABLE INCOME - Analysis shows that a circular economy could increase the disposable income of the average European household.[15] The cost of products and services would be reduced, and there would be less unproductive time (e.g. time stuck in traffic). The average disposable income for EU households would increase by EUR 3000 by 2030.

/GREATER UTILITY - The utility, or benefit, felt by customers may be enhanced by the additional choice or quality that circular models provide. Customer choice increases as producers tailor products or services to meet better their needs.

/REDUCED OBSOLESCENCE - For customers, overcoming premature obsolescence (the untimely failure of products) will significantly bring down total ownership costs and deliver higher convenience as they would avoid hassles associated with repairs and returns.

[15] www.ellenmacarthurfoundation.org/publications/growth-within-a-circular-economy-vision-for-a-competitive-europe

"To change something,
build a new model that
makes the existing
model obsolete."

Richard Buckminster Fuller - Architect

Imagine living in a new world where you could re-design everything: from objects to houses, from business models to economic systems. The good news is: we are already living in this new world. With all the current disruptive tools and technologies: artificial intelligence, internet of things, biofabrication, 3D printing, biomimicry just to name some - our design aspirations are limited only by our creativity. So why not challenge ourselves to re-think, re-design and re-purpose?

Whenever something is designed, various decisions and choices are made and impact the way something will be manufactured, used and wasted. As we mentioned earlier, these decisions and choices determine 80% of their environmental impact.[16]

Design, therefore, is at the heart of the circular economy. In this section, we will cover the role of design in creating a circular economy and present 6 strategies for incorporating the principles of the circular economy into our designs, according to the Ellen Macarthur Foundation learning path.[17] These strategies differ from traditional design approaches as they do not only consider the end-user needs but the system within which the design will exist.

So, how can we design for a Circular Economy? Let's go over the 6 strategies:

[16] - [17] www.ellenmacarthurfoundation.org

/CIRCULAR DESIGN

RE-THINK
RE-DESIGN
RE-PURPOSE

6 CIRCULAR DESIGN STRATEGIES

/DESIGNING FOR INNER LOOPS

In the circular economy butterfly diagram, as we mentioned previously, inner circle approaches such as reuse, sharing, remanufacturing, and refurbishment sit closer to the centre of the multiple material loops. In contrast, recycling sits farthest away (outer circle approach). The closer the loop is to the centre of the diagram, the more valuable the approach. Thus, the most effective examples of circular design are those that prioritise these inner loops of the circular economy. By designing products that can be easily repaired or remanufactured, or creating new business models to facilitate sharing, we will get much closer to a circular economy.

/MOVING FROM PRODUCTS TO SERVICES

The shift from ownership to access is central to the circular economy. It is crucial to understand that customers often only require access to a product for a short period after that, they can return it to the service provider or pass it on to a new user. In recent years, we have seen a range of new businesses based on this notion offering products to their customers either through rental, subscription, sharing or leasing rather than selling it.

/PRODUCT LIFE EXTENSION

Extending the life of a product is one of the core principles of the circular economy as it allows it to remain in use as much as possible. Designing products that can adapt to users' changing needs as time passes is crucial, either physical or emotional needs. **Petit Pli garment**, for example, is a brand that designs clothes for kids and allows them to use the same piece from 9 months to 4 years old.

The fabric is made from recycled water bottle using patent-pending technology developed in-house. In some other cases, objects may become even more valuable through repair, as is the case in the Japanese art of Kintsugi.[18]

[18] en.wikipedia.org/wiki/Kintsugi

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/SAFE & CIRCULAR MATERIAL CHOICES

Choosing the right material is crucial for a circular economy. Some materials contain chemicals that are harmful to humans or the environment. Additives are often used unintentionally or to improve performance such as flexibility or durability - but there are ways to design them out. When choosing materials that are safe and circular, we can build a better offering for users, while ensuring that the products and services we create fit within a circular economy.

/DEMATERIALISATION

This strategy is all about finding solutions to deliver utility using the minimum amount of material as possible. In sum, this means finding ways to virtualise your offering, creating a digital rather than a physical product - services such as Spotify and Netflix being prime examples of this approach. It could also mean designing your product or service in such a way that it requires a minimal amount of physical material. For example, if people could go shopping for groceries using a system of refill like the one proposed by the **Czech company MIWA**. They have created a circular system of reusable capsules, that has drastically dematerialised its packaging materials, by employing durable, reusable containers rather than single-use packaging.

/MODULARITY

Modular design is a valuable strategy for making products easier to repair, remanufacture, and upgrade. By making it easy to remove only part of a product, we make it easier to disassemble, decreasing the cost and effort to switch components when they no longer work. The Dutch mobile company **Fairphone** has created a modular design that allows, for example, the screen to be quickly and cheaply replaced when damaged. In addition to this, modular systems are easier to customise and adapt to users' constant needs, preventing products from becoming obsolete and ensuring they are kept in use for as long as possible.

"We showed that we are united
and that we, young people,
are unstoppable."

Greta Thunberg - Environmental Activist

/EMERGING TRENDS

NOW THAT WE HAVE GONE THROUGH THE BASICS OF THE **CIRCULAR ECONOMY** AND **CIRCULAR DESIGN** LET'S TAKE A LOOK AT TWO EMERGING TRENDS THAT ARE PUSHING **FOR A CIRCULAR FUTURE**.

N/T 5

/EMERGING TRENDS

CONSUMPTION & LIFESTYLE AS A POLITICAL ACT

© Parley with the Oceans -
The men's shoe by Adidas,
made with recycled ocean plastic

The current environmental crisis and its consequences do not spare anyone. We have been watching the devastating impacts of global warming all over the globe, including the recent fires in Australia and at this moment the consequences of coronavirus outbreak on air and water pollution (to name few).

Within this crisis, citizens are seeking ways to decrease their ecological footprint and therefore are more inclined to consume products and services that help them to do so. They have understood that their purchases' choices can help to pressure large corporation and brands to offer sustainable products and services, and therefore to take action against climate change. Consumption and lifestyle are more than ever becoming a political act.

While sustainable alternatives are becoming more widespread, they are not always available to everybody. But still, we can see some progress. If we look back, we can recall some products and services available only for few. In 2016, Adidas partner with **Parley for the Oceans** to produce a very limited-edition line of sneakers made from recycled ocean plastic (only 50 pairs). In 2019, they made 11 million pairs of ocean plastic sneakers.

N/T 5

/EMERGING TRENDS

CONSUMPTION & LIFESTYLE AS A POLITICAL ACT

© Burger King
plant-based version of the
Whopper sandwich

We can also think about the **"Impossible Burger"** and how in 2019 this vegan burger became available at over 7,000 Burger King outlets across the US. Another good example is the resale industry that is growing faster than the apparel one as people grow aware of the waste they produce.[19]

When sustainable alternatives become widespread, affordable and as good as the non-sustainable ones, people have more economic power to make sustainable choices. That is when "eco-consumption becomes less about the status of opting in, and more about the shame of opting out." That's the main reason we see that in 2020 and most probably 2021, millions of consumers will look for products, services and experiences that help them alleviate their so call "eco-shame."[20]

The coronavirus outbreak will definitely impact this trend further. While we go through an international quarantine that not only restricts our freedom but our consumption, we see a growing awareness towards what really matters in life, what is essential.

[19] Nextatlas, November 2019 | [20] TrendWatching, 2020

/EMERGING TRENDS

MILLENNIAL POWER, YOUNG & TECH SAVVY ACTIVISTS

Greta Thunberg
credit: Ernesto Ruscio
Getty Images

Recent protests and social movements are demonstrating that younger generations, especially Gen Z, are not as alienated as we had once thought, on the contrary, they are becoming the forefront on the climate change fight. Due to their tech-savviness, Gen Zers are pressuring politicians to address their demands and topics of interest, including climate change, inclusivity, gun violence, and LGBT equality. More and more, young activists, such as Greta Thunberg, are emerging as the leading actors for social, political and climate change.

The younger generation's growing frustration and concern for the future of the planet are more evident than ever. Research from 2019 shows that in 18 months the number of activists and protests has been steadily growing + 18% and 48% respectively.[21] As we write this e-book, we are witnessing the same generation trying to find other ways to create public awareness and advocate for climate change in times of coronavirus crisis. Greta Thunberg is encouraging people to avoid large crowds and protest online, tagging their social media posts with the hashtags #DigitalStrike and #ClimateStrikeOnline.

[21] Nextatlas, November 2019

N/T 5

/EMERGING TRENDS

MILLENNIAL POWER, YOUNG & TECH SAVVY ACTIVISTS

© Fairphone

And why this generation matter? Studies show that millennials are already 35% of the world working force and 20% of the global population. They are responsible for 21% of discretionary purchases, which means more than one trillion dollars in terms of purchase power. In addition to that, their purchase decisions heavily influence previous generations, especially when it comes to technology.[22]

In an increasingly globalized and interconnected society, Generation Z preferences and experiences are rapidly shaping the economy, the way we work, produce, consume and live. As a consequence, we are witnessing how brands in different sectors are changing their approach to business.

[22] www.millennialmarketing.com

"It is important that we repair before we despair."

Mathieu Rama - Senior policy officer at RREUSE

N/T 5

/THE FUTURE IS CIRCULAR

DESIGNERS AS PROTAGONISTS

The current environmental crisis and the rise of the circular economy are impacting the way we think about design. As we mentioned previously, design allows us to (re)think and (re)create almost everything. Design is more than ever seen as a tool to regenerate natural systems rather than destroy it.

Good design nowadays, and we believe this will be true in the future, is about creating ground-breaking innovations and solutions to our contemporary issues, from global warming to mental health. **Designers, therefore, are called to take action and to redesign places, business models, natural and social systems**.

In 2019, La **Triennale di Milano** hosted the exhibition **"Broken Nature: Design Takes on Human Survival"** curated by Paola Antonelli. The exhibition showcased various projects and products that confirmed how design and also architecture are collaborating with life sciences and social sciences to make reparations in the world around us.

Over the last two years, collaborations among designers and scientists have been seen often in European Design Fairs & Events such as Milan Design Week, Dutch Design Week, London Design Festival, Stockholm Design Week, Maison&Objet and imm cologne.

Sanctuary by Patricia Piccinini

Sanctuary was part of The Broken Nature exhibition
Courtesy of the artist and Arndt Art Agency Berlin, Tolarno Galleries Melbourne and Roslyn Oxley9 Gallery Sydney

/THE FUTURE IS CIRCULAR

INNOVATIONS FROM EUROPEAN DESIGN FAIRS & EVENTS

A **circular attitude to economy and design** is becoming more popular and even a matter of survival. We have identified **5 similar approaches** that brands, designers and students are using to **incorporate the principles of the circular economy** into their products, services and projects.

The Growing Pavilion by Pascal Leboucq and studio Krown Design - constructed with panels grown from mushroom mycelium. Image by Oscar Vinck

/MIMICKING NATURE

DESIGNERS ARE TURNING TO NATURE TO GET INSPIRATION AND IDEAS. THEY ARE MIMICKING NATURE'S DESIGN AND PROCESSES TO SOLVE HUMAN PROBLEMS. THEY ARE INCORPORATING BIOMIMICRY KEY PRINCIPLES INTO THEIR DESIGNS: NATURE AS A MODEL, MEASURE AND MENTOR.

FOOD FOR BUZZ

By Atelier Boelhouwer

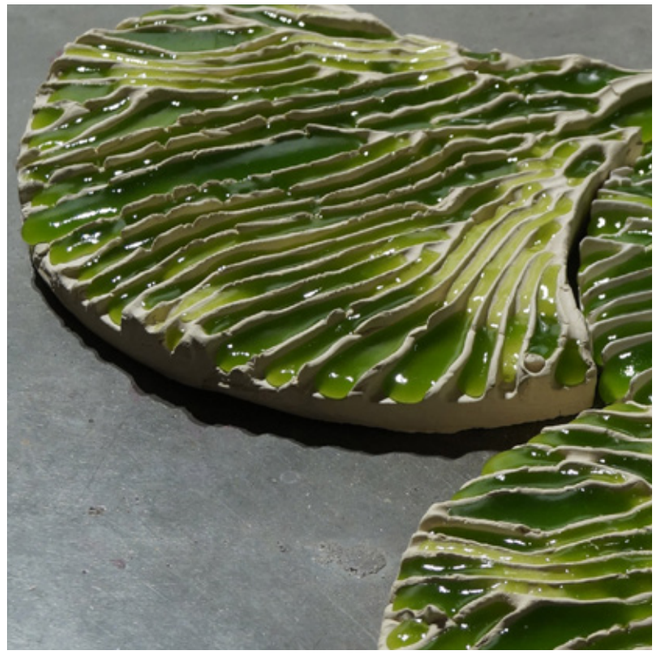
Food for Buzz is a project that deals with the drastic and harmful decline of the insect population in urban environments. Designers and scientists created 5 colourful man-made flowers to serve as an emergency food source for bees, bumblebees, butterflies and other insects. The flowers are adjusted to the insects' anatomy like eyes and tongues. This project shows us how scientists and designers are working together to find new solutions for environmental issues.

© Atelier Boelhouwer

INDUS TILES

By Bio-Integrated Design Lab &
Bartlett School of Architecture

Indus tiles is a modular system of tiles inlaid with algae that can filter toxic chemical dyes and heavy metals out of water. Each tile is made by pressing clay – or any other similar low-cost local material – into fan-shaped moulds with a series of "vein-like channels". These mimic the structure of leaves and their ability to distribute water evenly to every part of a plant.



© Bio-Integrated Design Lab
Photo - Andy Stagg

N/T 5

/BIOMATERIALS REVOLUTION

MATERIAL RESEARCH IS ON THE SPOTLIGHT WITH DESIGNERS EXPLORING ALL KINDS OF MATERIALS TO MANUFACTURE WITH. THE DESIGN WORLD IS NOW ASKING “WHAT IS THE ROLE OF THE DESIGNER IN THE DEVELOPMENT OF MATERIALS?”. ARE BLOOD, ALGAE, PROTEINS, MUSHROOMS MYCELIUM, RECYCLED PLASTIC AND POLYESTER FIBRES THE MATERIALS OF THE FUTURE?

DESIGNERS ARE NOW FOCUSING ON THE POTENTIAL OF MICRO-ORGANISMS, BODILY SECRETIONS AND TECHNOLOGY TO SAVE NATURE. THEY ARE RESEARCHING NEW WAYS TO INTEGRATE BIOLOGY IN DESIGN (BIODESIGN) TO TACKLE CLIMATE CHANGE.

BREATHING SHOE

By Puma, MIT and Fraunhofer Institute

The Breathing Shoe is designed with microorganisms including bacteria (the good ones), fungi and microalgae that can sense sweat or heat. During physical activity, our feet sweat and produce heat with more intensity in some areas. These microorganisms remove the material in the most crucial areas of the shoe creating unique ventilation patterns.

© Puma

BIOPLASTIC MADE FROM ALGAE

By Studio Klarenbeek & Dros

This Netherlands-based studio transforms living algae into bioplastic for 3D printing. The outcome is an elegant collection of 3D-printed bowls and vases. The designers believe that the algae polymer could be used to make everything from cosmetic bottles to tableware and then ultimately replace plastics made from fossil fuels such as oil. The studio’s ultimate goal is to create a biopolymer 3D printer local network: the 3D Bakery where people can ‘bake’ organic raw materials, just like fresh bread.

Photo by Antoine Raab

/DESIGNING WITH A.I.

DESIGNERS ARE INCORPORATING ARTIFICIAL INTELLIGENCE INTO THEIR IDEAS AND PROJECTS TO ACCELERATE THE TRANSITION TO A CIRCULAR ECONOMY. ARTIFICIAL INTELLIGENCE CAN SUPPORT AND ACCELERATE THE SPEED OF HUMAN INNOVATION TO DESIGN PRODUCTS, BRING TOGETHER ASPECTS OF SUCCESSFUL CIRCULAR BUSINESS MODELS, AND OPTIMISE THE INFRASTRUCTURE NEEDED TO LOOP PRODUCTS AND MATERIALS BACK INTO THE ECONOMY. FOR INSTANCE, INTELLIGENT AND CONNECTED ASSETS CAN ALLOW PREDICTIVE MAINTENANCE TO EXTEND THE ASSET LIFE; BLOCKCHAIN CAN CREATE TRACEABILITY AND TRANSPARENCY IN SUPPLY CHAINS TO REDUCE WASTE, AND REPAIR IS MADE EASIER BY 3D PRINTING OF SPARE PARTS.[23]

KARTELL A.I. CHAIR

By Philippe Starck

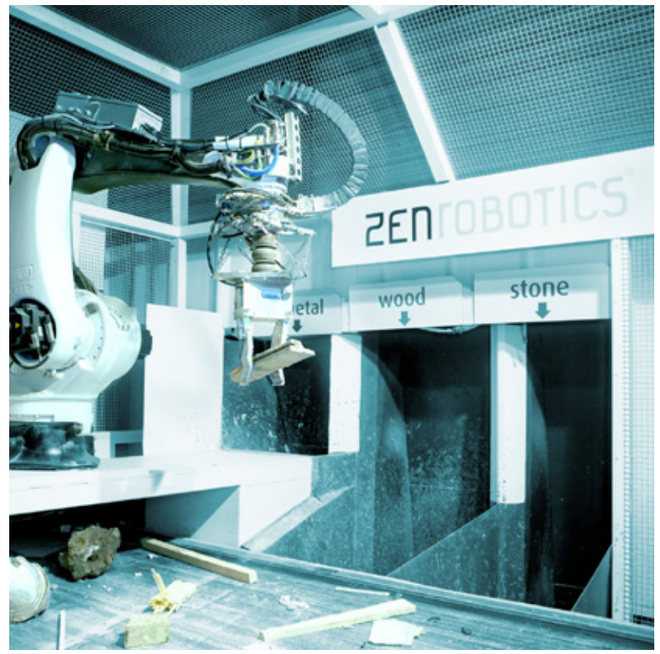
The Italian brand Kartell, French designer Philippe Starck and 3D software company Autodesk have worked together in the launch of the first chair created by A.I. in collaboration with human beings. The team has used an algorithm to conceive a chair with as minimal material as possible, while still matching the comfort and aesthetic standards required.

© Kartell

ZENROBOTICS WASTE MANAGEMENT

Founded in 2007, ZenRobotics combines A.I. and robotics to recover recyclables from waste.

The company technology allows greater flexibility in waste sorting, enabling operators to react quickly to changes in a waste stream and increasing the rate of recovery and purity of secondary materials. Cameras and sensors monitor waste. Their A.I. software, called ZenBrain, analyses the sensor data, creating an accurate real-time analysis of the waste stream. Based on this analysis, the heavy-duty robots make autonomous decisions on which objects to pick, separating the waste fractions quickly with high precision. This process increases the value that can be generated from material streams through improved recovery rates and overall quality of outputs.[24]



© Zenrobotics

[23] www.ellenmacarthurfoundation.org -
[24] https://www.ellenmacarthurfoundation.org/assets/downloads/Artificial-intelligence-and-the-circular-economy.pdf

N/T 5

/WASTE NO MORE

DESIGNERS ARE CONSIDERING MATERIALS AND ELEMENTS LIFE CYCLE AND TRYING TO DESIGN PARTS TO BE EASILY DISASSEMBLED, REPAIRED AND REUSED. SURPLUS FROM VARIOUS INDUSTRIES IS NOW BEING REPURPOSED INTO SUSTAINABLE PRODUCTS. THE PERCEPTION OF WASTE IS, THEREFORE, SHIFTING FROM UNWANTED MATERIALS AND A THREAT TO THE ENVIRONMENT TO VALUABLE RESOURCES.

SUBSTANTIAL FURNITURE

By Alexander Schul

A new generation of designers is pioneering ways of using recycled plastic as raw material. With his collection, Substantial Furniture, German designer Alexander Schul won the design category of the Ro Plastic Prize contest created by the Milanese gallerist Rossana Orlandi. The contest challenged designers to develop new ways of recycling and reusing plastic. Schul's Substantial furniture collection – comprising a lamp, a chair, and a side table – is made entirely from recycled plastic. The pieces were created using sheets of high-impact polystyrene. The designs are intended to be universal and easily manufacturable on a large scale.

© Alexander Schul

GRANBYWARE

By Granby Workshop

Granbyware is the world's first ceramic tableware collection made from 100% waste such as crushed glass, old tiles, factory sludge and other surplus streams. Each piece is beautifully crafted in Liverpool, and they're all 100% food, dishwasher and microwave safe. To bring Granbyware to life, Granby Workshop has worked closely with specialist waste management companies to identify a range of waste streams that could be harnessed for producing ceramics. They've considered all manner of sludges, silts, dust and debris - everything from incinerated sewage waste ash to recycled car battery compounds.

© Granby Workshop

N/T 5

/CONNECT & COLLAB

GLOBAL ONLINE PLATFORMS ARE CREATING NEW POSSIBILITIES FOR SUSTAINABLE COLLABORATION. CONSUMERS, DESIGNERS, BRANDS, INDUSTRIES AND UNIVERSITIES ARE ENCOURAGED TO CONNECT AND TO TURN WASTE INTO VALUABLE RESOURCES. WE ALSO SEE NEW PLATFORMS MAKING REPAIR OF ELECTRONIC GOODS ACCESSIBLE TO INDIVIDUALS.

TRASH2TREASURE

Trash2Treasure is a global platform that aims to connect industrial companies to designers. The idea is to provide designers with wasted materials that can be used to create sustainable products.

© Trash2Treasure

IFIXIT

iFixit is a wiki-based site that teaches people how to fix almost anything. Anyone can create a repair manual for a device, and anyone can also edit the existing set of manuals to improve them. The site is empowering individuals to share their technical knowledge with the rest of the world.

© iFixit

"Design is inherently optimistic.
That is its power."

William McDonough - Architect, Designer and Author

N/T 5

/INTERNATIONAL EMERGING & RENOWNED DESIGNERS

CASE STUDIES & INTERVIEWS

IN THIS LAST SECTION OF OUR E-BOOK, WE WANTED TO HEAR AND LEARN FROM INTERNATIONAL DESIGNERS AND COMPANIES WORKING WITH THE CIRCULAR DESIGN STRATEGIES. WITH THIS IN MIND, WE HAVE ASKED **15 EMERGING & RENOWNED DESIGNERS** THE FOLLOWING QUESTIONS:

- FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD? -
- WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU?
HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK? -
- WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE
TO BUILD A CIRCULAR FUTURE? -

IN THE NEXT PAGES, WE ARE SHARING WITH YOU
THEIR INSIGHTFUL THOUGHTS, RELEVANT
WORK AND PROJECTS.

/STUDIO CTT

ABOUT

Studio CTT is a design studio based in the Netherlands and focussed on social design and ceramics.

Carissa Ten Tije founded the studio after graduating from the Design Academy Eindhoven in 2019.

FEATURED PROJECT

Bottom Ash project is an extensive investigation that documents bottom ash current applications and possible new uses, including terrazzo-like stone material and wood stain. These applications demonstrate how the initially grey and lifeless bottom ash can be repurposed.

After we throw our household waste away, it makes its way to waste-to-energy-plants.

The waste-to-energy plant or also called trash-to-energy is a waste management facility that combusts wastes to produce electricity. This process produces a non-combustible residue called bottom ash.

Carissa Ten Tije claims that in the Netherlands one person's household waste produces an average of 57,5 kg of bottom ash per year. The designer decided to look at this material as a useful resource instead of a mere surplus.

LEARN MORE

www.carissatentije.nl | @studioctt

STUDIO CTT
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

To me, the role of a designer is to stay curious, pay attention to surroundings, stay openminded, inspire and be inspired and connect. Connect people, techniques, industries, materials and work together.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

When you look up 'sustainability' the definition is: the ability to be sustained, supported, upheld or confirmed. It also means the quality of not being harmful to the environment or depleting natural resources and thereby supporting long-term ecological balance. When you look up 'circular design': the definition is: the designing of a cycle in which resources are continuously recycled in various forms, following a reuse and recycle loop. Basically, waste does not exist but can be reused in a new way. While sustainability is more about finding ecological balance and harmony, circular design is about creating a cycle that allows waste materials to become a resource. So to me, sustainability and circular design are two different things but definitely coalesce. Through circular design, sustainability can be achieved. But I do think it's important that circular design is achieved in a sustainable way. Otherwise, the balance between those is gone, and without balance, there is no sustainability.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

One of the biggest challenges for designers working towards a circular future is finding the balance I was referring to earlier. It is competing with materials, such as concrete, that have been developed for over 200 years and are proven to be strong, long-lasting but very unsustainable in production. It is finding a sustainable replacement in a much shorter timeframe and then convincing the user to choose it over a material that has embedded itself throughout history in our society. Many people don't know that a lot of materials might seem sustainable or durable in their use, but the production of these materials are highly unsustainable. The balance for circular materials still needs to be shaped because it is such a relatively new concept when we compare it to hundreds-of-years-old materials such as concrete. We do not only need to introduce a circular future but also educate people on history, so they can understand the severe importance and urgency of this change.

> "MANY PEOPLE DON'T KNOW THAT A LOT OF MATERIALS MIGHT SEEM SUSTAINABLE OR DURABLE IN THEIR USE, BUT THE PRODUCTION OF THESE MATERIALS IS HIGHLY UNSUSTAINABLE."

/OUT FOR SPACE

ABOUT

German company **Out for Space** is a team of interdisciplinary professionals who combine research and aesthetics to develop and produce sustainable products inspired by nature, traditional crafts and new technologies.

FEATURED PROJECT

Karuun® is a lightweight material made from rattan palm's natural structure. Karuun is permeable to air and light and at the same time is resistant and pleasant to touch. Its application ranges from insulation, ventilation, interior design, lighting, and floorings. Karuun is a natural alternative to plastic as well as timber.

Rattan relies on biodiversity and cannot flourish in a monoculture. It needs the rainforest to thrive, thus supporting its cultivation helps to preserve the planet's rainforests and provides local communities with a sustainable income.

Out for Space not only produces innovative rattan products with beautiful design and new applications, but it does so collaborating with Fairventures Worldwide to make sure all their rattan comes from sustainable sources in Central Kalimantan, Indonesia.

LEARN MORE

www.karuun.com | @karuun_materials

Photo Courtesy: ofs

OUT FOR SPACE
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

The designer of today is a combination of researcher and designer. They are forging a new path in the development of responsible products. Their role is to be inspired by nature, traditional craftsmanship and new technology. The designer of today creates products and unique concepts and bridge the gap between our present and future.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Sustainability and circular design embody the ability to combine social, economic and ecological interests. This balance is in tune with our times and provides an excellent position to all industries who want to use such circular-designs to fulfill customer's requirements of today and tomorrow. These concepts are very important to us. One of the main causes behind nature destruction is the local population's need for resources and better living.

"WE BELIEVE PROTECTING THE ENVIRONMENT AND APPLYING CIRCULAR DESIGN CAN ONLY WORK IF SOCIETY, ECONOMY AND THE ENVIRONMENT BENEFIT."

We believe protecting the environment and applying circular design can only work if society, economy and the environment benefit. This philosophy is inspired by nature itself.

The planting and harvesting of rattan for karuun® intend to guarantee local people a long-term income by protecting existing rainforests and leading secondary forests back to biodiversity.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

Globalisation, the steady growth of the global economy poses major challenges, especially to our ecosystem and poorer strata. Future-oriented designers are already responding to these challenges and reacting to our today's world problems. This shift in attitude has to push us to take responsibility for ecological and social design.

/MARIE-LOUISE HELLGREN

ABOUT

Swedish designer **Marie-Louise Hellgren** is an international pioneer in the upcycling movement; she sees beauty where others see waste. She works with a variety of products and materials and with both large global companies and smaller local actors.

FEATURED DESIGNS

The **Lilla Snåland** stool and the **Pink One** puff designed by Marie-Louise Hellgren is a reminder of how wasted materials can be transformed into valuable resources and beautiful designs. “Give me worn-out furniture or leftover fabrics, scrap metal or airbag fabric and I will create something new”, Hellgren explains. In fact, her pieces are not only sustainable but aesthetically pleasing.

The so-called Lilla Snåland stool is made from upcycled wood waste from the Swedish chair factory Stolab. The stool is an award-winning design piece and is currently on display in Sweden’s National Museum in Stockholm. The Pink One Puff is made from upcycled air-bag fabrics.

LEARN MORE

www.marielouisehellgren.com | @marielouisehellgren

Photo by Charlotte Gawell

MARIE-LOUISE HELLGREN
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

As our society changes, so does the role of designers. Digital communication and marketing allow designers to reach new international markets and to collaborate. We are seeing an increase of designers working with design services. Technologies such as 3Dprinting and its smaller cottage factories make it easier to sell limited editions in our own webshop. Ultimately, environmental and health problems are impacting design and pushing designers to become more of problem solvers.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Circular design and sustainability mean a lot to our studio and me as a designer. Both are considered and are the basis of all our projects. We work almost like a lab, testing and experimenting, using our combined creativity and always being open to ideas and innovation. We always ask ourselves how can the product, the interior space, materials or installations be made as holistic as possible. Even though sometimes this means our studio will say no to some projects, we walk the talk.

> "DESIGNERS NEED TO LEARN HOW TO DESIGN FURNITURE, CLOTHES, OBJECTS THAT ARE EASY TO RENEW OR BE TRANSFORMED INTO SOMETHING ELSE."

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

The biggest challenge, for us as designers, is to be firm towards the commercial world and to say no to the ever-growing demand for new things. We need to focus on designing long-lasting and timeless objects that have a high design quality in terms of aesthetic, functionality and materials. We really need to think through the intention behind our designs. Why are we designing this new item?

As a circular designer, I have the conviction to save the world from more waste and especially toxic waste. We have a responsibility to use healthy materials considering biodegradability, to work with the Cradle to Cradle principle and to have a compassionate attitude towards all living things on the planet.

The design education needs to change and focus more on redesign and upcycling. Designers need to learn how to design furniture, clothes, objects that are easy to renew or be transformed into something else. We will be forced to work with used materials and to upcycle instead of designing with virgin materials.

Also, as human beings and living species on the earth, we need to adapt to a holistic way of living based on a sharing economy, on collaboration and a community-based responsibility. For instance, we are already sharing cars, tools, digital equipment and even co-gardening our vegetables.

/PONTO BIODESIGN

ABOUT

Ponto Bio is a Brazilian-based design studio founded by Elena Amato. The studio works as a lab for biofabrication experiments. Amato is one of many designers experimenting with bacterial cultures to create sustainable alternatives to plastic.

FEATURED PROJECT

Elena Amato has created sheets of bacterial cellulose with paper-like qualities as an option to plastic **packaging for personal care products**. The sheets were developed using a mixture of water, bacteria and yeast (scoby) culture. All these components are blended together before being spread out on a flat, smooth surface and left to dry.

To achieve natural colours, the designer adds natural pigments such as charcoal, spirulina, saffron and hibiscus. The dried sheets can be glued together, using only water.

Amato's inspiration comes from nature and follows the principles of the circular economy. Her packaging design mimics the natural packaging system found in structural layers of fruits (juice, pulp and outer peel).

The internal layer is the personal care product itself, the second layer is a capsule-like container made of solid natural soap used to store the product, and the third external layer is the sheet made from bacterial cellulose to protect the soap container beneath and to display information.

LEARN MORE

@pontobiodesign

Photo Courtesy: Ponto Biodesign

PONTO BIODESIGN
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

Designers have to re-think the present and create practical, beautiful and healthy solutions that lead the way towards a more sustainable future. We have to provide the tools to facilitate the transition to a circular economy.

We, as designers, have the ability to make changes from the internal business structure to the services and products that are offered to users. Designers have to actively design more sustainable options for consumers, thinking about the entire product life cycle. Sometimes we blame consumers for not taking action. Still, I believe that if designers create thoughtful solutions, consumers would naturally shift to a more sustainable future because they would have more options available.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

We were born in the linear economy system, where we feel it's natural to extract materials, manufacture products and then throw them away. But where is that "away"? We are just making huge piles of mixed materials, wasting and contaminating the resources of the planet. The whole universe works with circular flows: our lives, energy, the climate, everything flows and one thing feeds the other. We have been trying to force a linear system that obviously isn't working.

Circular design is a framework that facilitates the development of concrete solutions for the circular economy. It is a systemic approach that gives the tools to create products, services and experiences that benefit businesses, society, and the environment, which are the 3 pillars of sustainability.

> "THE WHOLE UNIVERSE WORKS WITH CIRCULAR FLOWS: OUR LIVES, ENERGY, THE CLIMATE, EVERYTHING FLOWS, AND ONE THING FEEDS THE OTHER. WE HAVE BEEN TRYING TO FORCE A LINEAR SYSTEM THAT OBVIOUSLY ISN'T WORKING."

Sustainability and circular design are the basis of our work at Ponto Biodesign. Our concept is based on "when biology and design meet". Our aim is to develop compostable, beautiful, healthy materials, grown by microorganisms and using food waste as raw-resources. We want to create options that enable materials to flow on integrated and regenerative systems, returning safely to nature as nutrients to be a part of the material cycle again. We want to allow consumers to make this possible, and we want to work with and for nature. We believe that in the near future biomaterials are going to be everywhere, in medicine, fashion, packaging, toys, furniture, buildings, etc.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

For me, the greatest challenge for circular design is education, awareness and engaging the community to take action. People need to work together as a system and be mindful about the importance of making the shift towards a more circular economy.

The easiest thing to do is to continue doing things the way we are used to. It's easier to ignore the problem than to re-organize and re-think material sources, manufacturing processes, consumer behaviours and how we discard the products we buy.

It is important to change the impression that circular design is a utopic ideal, which only non-profit organizations work with to save the planet. Circular design is about financially sustainable solutions. Circular design, besides being necessary to our survival on this planet, must be lucrative and appealing for companies and consumers.

Speaking specifically about material biofabrication for consumer products, I think it is still a challenge to get the production into a broader scale. I find companies like Ecovative, Malai, Make Grow Lab and Boltthreads an inspiration. I hope researchers and startups that are working in this field persevere so biofabricated materials can soon be available on a larger scale.

/ENIS AKIEV

ABOUT

Enis Akiev is a material designer who believes waste is something subjective: “what is considered waste in one place or situation can be a resource in another condition.” This notion of waste is the foundation of her BA project “Plastic Stone Tiles”.

FEATURED PROJECT

Plastic Stone Tiles – The Nature of Waste is Enis Akiev’s BA project for the Köln International School of Design. Her research and concept arose from the thought that nothing is worthless, and there is no such thing as waste.

The “plastic stone tiles” she creates are made from plastic waste that undergo several processes which are similar to the ones of rock formation. Akie explains: “Plastic waste makes its way into our geological landscape by becoming part of stone sediments on beaches and forming a new kind of stone named plastiglomerate.” She raises the value of plastic trash to show the external costs and change the perception, so plastic is no longer seen as trash. For that, she uses single-use plastic packaging as raw material. From the resulting material, she then makes beautiful tiles for interior use.

LEARN MORE

cargocollective.com | @plasticstonetiles

Photo Courtesy: Enis Akiev

ENIS AKIEV
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

Be a mediator between aesthetics and science, a problem solver, socially, environmentally, a concept developer, a researcher.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Sustainability and circularity are immensely important. They should not be treated as a separate design field but be incorporated in every design field. As the cradle to cradle principle from Michael Braungart and William McDonough says, we need to close loops and save materials from being discarded. If you do not bring products to their original form, then you have not created a cycle; instead, you have created a spiral. With spiral, I mean that materials are being saved from the bin however, they are not brought back to their original form. Instead, they are brought to a different or a lower value one.

Circularity is often used as a buzzword. You could say that there is a lot of circularity washing going on. Or a certain circularity quota is wanting to be met without really embracing the circular concept. This needs a lot of work and change, change in production methods, in products themselves, and behaviour.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

Industries and capitalism. For me, it is hard to get plastic waste even though there is so much of it in Germany. I cannot keep hold of it. China stopped importing waste from Europe, the USA and Australia in 2018 and now waste from Germany is being taken to Turkey where it is processed into granulate and repurposed.

Germany is the world's third-biggest plastic producer and has a sufficient sorting system but cannot recycle all of its plastic, so the country ends up exporting it. Turkey recycles sorted German trash only because it is convenient. Still, in its own country, Turkey do not have a collection system and do not sort plastic, so the plastic waste finds its way into nature and the Mediterranean sea. Importing of plastic waste is therefore damaging and only done because it is more cost-efficient.

In general, cost efficiency is a much higher priority in industries than circularity and sustainability. If we really want to create a circular future, conventional systems will have to change. Systems we are used to and which bring us convenience.

"IN GENERAL, COST EFFICIENCY IS A MUCH HIGHER PRIORITY IN INDUSTRIES THAN CIRCULARITY AND SUSTAINABILITY. IF WE REALLY WANT TO CREATE A CIRCULAR FUTURE, CONVENTIONAL SYSTEMS WILL HAVE TO CHANGE. SYSTEMS WE ARE USED TO AND WHICH BRING US CONVENIENCE."

/KATHRYN LARSEN

ABOUT

Kathryn Larsen is a bio-based designer and architectural technologist. She has been exploring the uses of eelgrass and seaweed within sustainable constructions.

FEATURED PROJECT

Kathryn Larsen built **"The Seaweed Pavilion"** in collaboration with a team of former and current students at the Copenhagen School of Design and Technology.* The team created this project based on the vernacular construction methods that are often forgotten as sustainable solutions, with local materials and builders.

The Seaweed Pavilion explores a return to ethical, community building, and the impact it can have on the individuals participating. Eelgrass was once used as insulation material and as roofing on the island of Læsø. The material is rot-resistant, fire-resistant, is non-toxic and can support local plant life, yet there is a lot of prejudice against seaweed as a building material. By creating a public pavilion and inviting people to take a seat under the seaweed, the team hope to change the perception about this eco-friendly material.

LEARN MORE

kathrynlarsen.com | @theseaweedgirl

**Build team: Gabriel Pantoja, Andrejs Mocalovs, James Birkenshaw, Monika Jakaityte*

Photo by Kel Hudson

KATHRYN LARSEN
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

I always think of a designer as a problem solver. In order to have a concept, you must have a goal or a hypothesis, and design is the way of formulating a solution to that.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

I work in the building industry as a regular construction architect. So, sustainability and circularity to me mean reducing waste. Renovating over building new, and saving or redesigning what already exists are some of the tactics I use in my daily work life, and clients are always happy to save money.

I would say that they're central themes throughout my personal design work because I'm primarily inspired by vernacular architecture. Vernacular architecture tends to use local, biobased materials, with creative solutions and applications. Historically, if you ran out of building material, you were forced to find a new solution because you couldn't just ship some tiles from Italy. Unfortunately, these building methods have been seen as "primitive" or snubbed historically in the architecture world, because they were solutions created by the masses without an architect. As a result, we ended up losing some of this knowledge. I combine material design with vernacular architecture, to develop new sustainable solutions, but also have ties to our culture and history.

With my eelgrass thatch panels, I designed it so the materials can be separated easily, re-used, or recycled. The eelgrass can become fertilizer at the end of its life. Then with The Seaweed Pavilion panels, my goal was to begin to get people to interact with the material. So many people are surprised that it's seagrass, and that it doesn't smell or rot. They're even more amazed when I tell them that this resource has been used as a building material since the middle ages. Its insulation is compared to modern mineral wool, which is amazing. Somehow our ancestors figured that out, and then we forgot.

Eelgrass is currently seen as waste around the world and just thrown out after being collected from beaches. I think that we need to return to using this material locally and seeing it as a valuable resource again.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

Two things: money and politics. Simply put, we can design all the cool, circular solutions in the world, but without funding and support, these ideas aren't going anywhere.

I'm fortunate to be supported by a local foundation called Boligfonden Kuben, and the grants they've given me have supported my work and the labour of my team, and allowed me to do all this in my free time.

The politics part is crucial because we need legislative support to test these new ideas, so we keep people safe, but we also make these solutions legal. Sometimes regulatory capture can make it very difficult to go to market because you're competing with huge companies that have helped to write the laws in their own favour.

"SIMPLY PUT, WE CAN DESIGN ALL THE COOL, CIRCULAR SOLUTIONS IN THE WORLD, BUT WITHOUT FUNDING AND SUPPORT, THESE IDEAS AREN'T GOING ANYWHERE."

For example, in the building industry, local plan laws often limit which materials can be used in our homes or what a legal construction must be. Again, this is to keep people safe from things like fire and keep their homes from making them sick. However, if local municipalities are willing to suspend or give dispensation in some instances for new materials based on testing results, this would be the start for new ideas and materials to be widely adopted.

/WOODIO

ABOUT

Woodio is a Finnish design-oriented material technology company with innovative and sustainable designs for bathrooms. Their patented material is the world's first 100% waterproof wood composite that consists of real wood chips.

FEATURED PRODUCTS

Woodio unique material innovation was inspired by an idea of making wooden bathroom tiles, something extremely challenging at first. Woodio currently provides washbasins and bathtubs designs with a unique, minimalistic style.

When compared to traditional ceramic bathroom products, Woodio design pieces significantly present a lower carbon footprint, throughout the whole product lifecycle.

In fact, they claim to have 55kg lower CO2 emissions per unit .* Their products are disposable as energy waste, designed and produced in Finland and their core material, wood aspen, is locally sourced.

LEARN MORE

woodio.fi | @woodiodesign

** Source: A. Nurmio / Aalto University*

Styling and set design: Laura Räihä | Photo by Riika Kantinkoski

WOODIO
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

Our role as an eco-design company is also to raise discussion around topics that have an impact on the well-being of our Earth. And the bathroom industry has a lot to improve in this area. We are here to disrupt and change the way people think about bathrooms, and to offer a solution that is less of a burden to the environment.

As a brand, we want to make a difference and help people make sustainable choices by showing that sustainability does not mean a compromise in performance, functionality or design. Our material is the world's first 100% waterproof solid wood composite made from real wood chips. Its' carbon footprint is a lot lower than traditional bathroom materials.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Sustainability and circular design are in the very core of our company. These values are rooted both in our vision to become the world's leading eco-design brand as well as our mission to fight climate change with sustainable design and material technology. We live in a world that is facing an ever-increasing global consumption, and there are both environmental as well as socio-economic challenges related. The way we see the world is that the transition towards a circular economy and design is a must.

Last autumn we got Finnish forestry company Metsä Group as a partner. For Woodio, this brings not only financial stability but also a partnership with significant new resources in R&D from Metsä Group's under-utilised side-streams. This spring we are launching our first collection that gives a new life to Metsä Group's pulp mill side-stream wood chips that would have otherwise been burned.

Overall, we put a strong focus on making sustainable choices throughout the whole production process - from the material itself to manufacturing. Woodio products have a significantly lower carbon footprint throughout the entire product life cycle than traditional ceramic bathroom products.

Our products are also disposable as energy waste, and this means that they can be burned as energy at the end of their life cycle.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

"FOR US, DESIGNERS OF TANGIBLE PRODUCTS, THE CHALLENGE OF LARGE SCALE PRODUCTION IS A BIG ONE. HOW CAN WE DESIGN AND MASS-PRODUCE PRODUCTS THAT ARE BOTH RESTORATIVE AND REGENERATIVE?"

We are mostly still living in a linear world, where goods are manufactured from raw materials, sold in the largest possible quantities, and eventually discarded.

But to make a change, we are now faced with the challenge to research and reinvent materials and also investigate how we can reuse them several times over, while making them long-lasting and creating minimal waste. For us, designers of tangible products, the challenge of large scale production is a big one. How can we design and mass-produce products that are both restorative and regenerative?

/STUDIO FLAER

ABOUT

Studio Flær is a Berlin-based design studio founded by Anna Drewes and Dario Iannone.

The studio is focused on accessible and meaningful design that aspires solutions for future key topics as holistic product-service systems, digital transformation and circular economy.

FEATURED PRODUCT

Studio Flaer has created the Indigo Acoustic panels, which draw upon Taiwan's cultural heritage, in collaboration with Taiwanese local bamboo artists, artisans and material researchers. Emblematic local patterns, traditions and customs are translated into these sound-absorbing spatial structures.

The acoustic panels are made of 100% organic bananas and mulberry fibres, dyed with indigo plants and framed with bent bamboos. In order to create a closed biological loop, all materials are treated to be non-toxic and biodegradable. The design beauty goes beyond aesthetics and relies on the positive connection built between culture, communities and nature.

LEARN MORE

studioflaer.com | @studioflaer

Photo Courtesy: Studio Flaer

STUDIO FLAER
/ THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

The role of a designer today is a fascinating one. It has become essential to be aware of the entire systems and processes and consider these in every design decision we make. Therefore, design has become a more complex discipline where the interconnectedness of ecosystem, user and producer, (just to name a few) plays an increasingly important role.

All these make design more than ever a collaborative discipline where different minds join in to reinvent great solutions for the contemporary world.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Circular design means a great opportunity to rethink systems and their products and to adjust them to our future needs and challenges. It also means to become a part of a genuinely long term plan which will maybe need generations to set in motion. For our work, these concepts are an essential part, and we hope that we can contribute to making it become a reality.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

Being patient and persistent.

"THE ROLE OF A DESIGNER TODAY IS A FASCINATING ONE. IT HAS BECOME ESSENTIAL TO BE AWARE OF THE ENTIRE SYSTEMS AND PROCESSES AND CONSIDER THESE IN EVERY DESIGN DECISION WE MAKE."

/QWSTION

ABOUT

QWSTION is a Swiss brand designing versatile and sustainable carry solutions for everyday use.

Their bags and backpacks are made from plants and have a low environmental footprint.

FEATURED PRODUCTS

QWSTION has developed **Bananatex®** the world's first durable, waterproof fabric made entirely from banana plants. The fabric is 100% biodegradable and is being used for the first time in bags and furniture production.

Cultivated in the Philippines within a natural ecosystem of sustainable forestry, the plant requires no chemical treatments. Its self-sufficiency has made it an important contributor to the reforestation of areas once eroded by palm plantations while increasing local farmers prosperity. Bananatex® is a new material that manages to tackle matters of environmental, economic and social sustainability. The project has recently won the Design Prize Switzerland 2019.

LEARN MORE

www.qwstion.com | @qwstion_official

Photo by Yves Bachmann

QWSTION
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

I see the role of the designer in "connecting the dots“ with creativity as his tool.

Contemporary designers should unite social, technological and economic factors to create purpose and value. Although I believe this is nothing new and has been stated by Dieter Rams on several occasions.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

The “ability to sustain” means nothing less than survival, in the long run – and our species seems to have lost touch of this fundamental concept.

Circular design is putting things back into the perspective of us humans being part of a natural system. These concepts are essential to our work at QWSTION, and they ultimately belong together.

> “I SEE THE ROLE OF THE DESIGNER IN "CONNECTING THE DOTS“ WITH CREATIVITY AS HIS TOOL. CONTEMPORARY DESIGNERS SHOULD UNITE SOCIAL, TECHNOLOGICAL AND ECONOMIC FACTORS TO CREATE PURPOSE AND VALUE."

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

Our growth and profit-focused economy are built on linear principles – which allows the exploitation of limited natural resources at a fraction of the actual cost. This currently makes sustainable, circular products more expensive than their alternatives.

Communication is challenging in this regard, as the complexity of our globalised world has become huge, and any product is labelled “sustainable” if it helps to sell it. It is very difficult to understand the difference between greenwashing and real sustainability.

/MIYUCA

ABOUT

Miyuca is an Italian-based multidisciplinary design studio founded by designer Jasmin Castagnaro.

The studio offers customised graphic and product design and handmade creations. Purity and simplicity are the foundations of Miyuca's projects.

FEATURED PROJECT

Miyuca Studio has developed **LAAB** a handmade material created out of autumn leaves and biological resins.

Every autumn, millions of leaves fall to the ground and are regularly thrown away in our cities. The studio decided to turn this unused material, considered waste, into "the beginning of a new life."After the leaves have fallen to the ground naturally, they are collected and carefully sorted by colour and type, before being mixed with natural additives and biologic resins.

LAAB gave life to a series of sustainable lamps in an effort to replace plastic with natural resources. To create the pendant lamps, the studio uses reusable wooden moulds. The unique thing about this material is the personal touch that every customer can add. It often happens that the leaves come from the surroundings of customers or even were picked together with them, explains Jasmin Castagnaro.

Since the market launch in 2017, the studio has created a lot of other new products using the LAAB material, such as panels for tabletops, partition or back walls and furniture cladding

LEARN MORE

www.miyuca.it | @miyucadesignstudio

Photo Courtesy: Miyuca

MIYUCA
/ THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

The role of a designer is more important than ever in today's world. It is no longer enough to create beautiful things, and the designer has to deal with essential questions that are strongly related to nature. What raw materials can my products be made of, where do they come from and what influence do they and my creations have on the environment? In my opinion, every designer should ask himself these questions before starting a new project.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Sustainability has a very high value in my designs. The basis of my products is always natural materials. In order to bring in a circular design aspect, I try to use materials that are usually seen as waste. My primary material, autumn leaves, are given to us by nature, but as there is no natural recycling-cycle in the city, we just throw away these leaves. Here is where I, as a designer, step in and recycle this material into new products until new leaves fall in autumn and the cycle starts again.

> "IT IS NO LONGER ENOUGH TO CREATE BEAUTIFUL THINGS, THE DESIGNER HAS TO DEAL WITH IMPORTANT QUESTIONS THAT ARE STRONGLY RELATED TO NATURE."

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

I think the biggest challenge is to make such products marketable; in this way, they can replace some other products that are worst for our environment. There are a lot of great projects which are difficult to produce on a larger scale. Products with a sustainable concept often need more time in production or can only be produced in smaller quantities because the raw materials are limited or have to re-grow. Unfortunately, this usually means that significant demands cannot be met and great ideas remain small.

/POST CARBON LAB

ABOUT

Post Carbon Lab is a transdisciplinary design research studio founded by Dian-Jen Lin and Hannes Hulstaert. The studio is focused on biodesign, regenerative sustainability and on the development of materials and processes that can help us alleviate global warming.

FEATURED PROJECT

In an effort to create a sustainable fashion industry, Post Carbon Lab launched their pilots services of two pioneering microbiological processes for sustainable and regenerative fashion applications: **Bacterial Pigment Dyeing and Photosynthesis Coating** on fabrics and garments.

These two pilot services were showcased at the London Design Festival 2019 along with upcycled textile-bioreactors made out of foraged waste materials — e.g., inner bike tubes and windows, from the urban households across London. Design fashion pieces coated with photosynthetic microorganisms and dyed with pigment-producing bacteria were also on display. People could bring old t-shirts, tote bags or accessories to be revamped not only into colourful and stylish pieces but also into living and photosynthesizing wearables that mitigate their carbon footprints.

LEARN MORE

www.postcarbonlab.com | @postcarbonlab

Photo Courtesy: Post Carbon Lab

POST CARBON LAB
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

Designers are the perception-shapers of the world because they give form, texture, colour and story to the intangible such as dream and vision. In our turbulent times, designers sought to exploit their roles as the reality converter to hack the algorithms that have proven to be defunct and corrupt from the core of human activities – greed and disrespect.

Every contemporary designer should be an activist for change, a facilitator for converting to change and an educator for promoting the awareness of change. By manipulating the reality and illustrating the vision they wish to present, designers can paint the scenario for users to perceive, think and act according to a predetermined blueprint they have engineered. This also implies that designers can futureproof audience by and through design.

As we face the possibility of self-extinction, designers hold the power to locate the best narrative to guide us away from business-as-usual and embrace the necessary changes towards more sustainable and equal futures.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

At Post Carbon Lab, we see circular design as the baseline to start any project, sustainability as the drive behind every decision-making, but the main target is regeneration.

Circular design is important, but unless holistic life cycle analyses of assessments are conducted to make sure there is no “negligible” waste in specific systems, circularity will remain an ideology that we should have all adopted before any system or infrastructure was established. The reason is that we have done so much wrong collectively and if we are only aiming to reach the carbon-neutral goal (as the circular model is about all net input equals all net output), we still fall short and remain in the minus zone. Also, what happens to all the damages we have done in the past? Since when have we started with a clean slate when it comes to carbon emission, environmental damage and the suffering of the marginalised?

We think everyone should at least aim higher. If we don’t target to pursue regeneration, rejuvenation, replenishment, restoration and revitalisation, we stand little chance in keeping the rising temperature within 1.5 degree Celsius.

> “DESIGNERS ARE THE PERCEPTION-SHAPERS OF THE WORLD BECAUSE THEY GIVE FORM, TEXTURE, COLOUR AND STORY TO THE INTANGIBLE SUCH AS DREAM AND VISION."

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

Sustainable fallacy, a false belief that what we are doing is already more sustainable than what is out there, and therefore, we are sustainable. However, the cruel truth is that it is often more sustainable, as in contributing to less carbon emission, if we were to do nothing because the most sustainable thing we can have is what we already have. Only by acknowledging this fallacy will we be able to differentiate between actual attempts of sustainability and greenwashing marketing.

This might sound harsh, but it is a fallacy that we often fall into ourselves. Yes, it is still vital to provide more sustainable alternatives to traditional ways of making. However, this should not be an excuse for us to stop questioning ourselves to be more sustainable, nor should it be exploited as a justification of the unsustainable elements that still exist within the system. The real verdict comes down to whether what one is planning to do better than not doing anything at all. What will the world, environment or people benefit from the creation of this one extra design project? If this is not justified, it should not be created in the first place.

A good example of this case is the beaches that were ravaged by tourism in Thailand. Thai government closed down the Yoong and Tachai Islands since mid-2016, and they have been able to observe the remarkable recovery of coral reefs and wildlife.

It is still great for anyone to explore circular systems, cradle to cradle philosophies and experiences and different ways of approaching design. Yet, a circular design still largely depends on the environment self-renewal when it comes to correcting the damages that we have done in the past because it aims to enclose certain manufacturing loop and neglects the fact that such interaction can be designed to benefit the environment. The only way to start accelerating the regeneration of the environment is to consider at least adding such element within the design process.

If we keep believing that we can have a circular future just by making circular designs and not making mends, we will likely run out of time before circular values entirely remodel the Capitalistic systems.

/JIANI ZENG

ABOUT

Jiani Zeng is an industrial designer, engineer and researcher working in the intersection of consumer product design and technology. Her work explores new design opportunity beyond the limit of current manufacturing and materials such as soft robotics, multi-material 3D printing etc. She holds a Master of Science in Integrated Design and Management (IDM) from MIT and has created her own start-up “Technologies and Radical Department Inc”, based in San Francisco, USA.

FEATURED PRODUCT

Jiani Zeng has created **DUAL** a liquid hand wash using solid soap as packaging. After using up the liquid soap, it is possible to remove the paper wrapping and use the solid soap as hand wash. In the end, the dispenser pump is the only component left and can be used in another DUAL soap replacement.

The project questions the consumer market and the meaning of producing and buying different products with the same end function: “ What is driving consumers to shop for goods only with different “shells”? What is packaging? What is the feature that differentiates a product?” For Jiani Zeng, a design that reduces plastic pollution generated by waste bottles, it is what makes a difference.

LEARN MORE

www.jianizeng.com | @jianizeng

Photo Courtesy: Jiani Zeng

N/T 5

JIANI ZENG
/ THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

I want to be the designer who changes the way people design, from atoms and bits. As an industrial designer by training, I'm experiencing the rise and fall of physical object design, a designer who does not do UI/UX seems a bit "out of date". But I am always fascinated by physical objects: I believe industrial design is the sexiest subject if designers can explore new opportunities beyond the limit of current manufacturing and explore new materials from meta-level. My recent researches at MIT are mainly around applying new technology and computational thinking in designing objects, such as soft robotics, multi-material 3D printing, etc.

I believe future designers should always push the limit in design resources and make their own rules in design rather than merely looking at what is "feasible" to be produced.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Many people relate sustainability and circular design to natural materials, bio-materials and recyclable materials. For me, the material itself is an illusion; we don't use materials for their physical entities. Instead, we need materials to perform different properties for various purposes. If there is one "super material" that can mimic any material properties in the production, we might solve the big problem of material waste, recycling, distribution etc.

My project "DUAL" reflects this concept of using the functional product to "mimic" another tangible property - the packaging, without adding another physical entity to the product system.

Last year, I continued my vision about sustainability with multi-material 3D printing, since these printers can create an object with multi-identity material (with different appearance and properties) in a single print. From "look like" to "feel like", it mimics various materials with the same origin. It might be the ultimate solution for sustainable design: imagine in the future, there's one material that mimics any material properties and can be 3D printed in any form, and can be recycled easily to become the original filament.

"IF THERE IS ONE "SUPER MATERIAL" THAT CAN MIMIC ANY MATERIAL PROPERTIES IN THE PRODUCTION, WE MIGHT SOLVE THE BIG PROBLEM OF MATERIAL WASTE, RECYCLING, DISTRIBUTION, ETC."

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

One material for all, all for one material. Many pieces of research are concerned with reducing packaging waste or designing with sustainable materials. While the next challenge lays on the product itself: can we reduce the number of assembled parts, layers of coatings and multiple regions to be recycled? Can we design for disassembly? Or can we design with one material and recycle it in the future?

/PENSIEROMATERIA

ABOUT

Pensieromateria is a collective of Italian designers working together to develop a design in an optic of sustainability through the use of natural materials. The collective was born from the meeting of Luca Alessandrini, a r&d and design engineering consultant specialised in disruptive processes, and HENRY & CO, a design studio working with sustainable products. Together they've launched the “Manifesto of Italian Bio-Design” focused on four key rules for who ventures into sustainable design: circular economy, consumptions decreasing, agri-food supply chains and new materials.

FEATURED PRODUCTS

In 2019, Pensieromateria took part at the MDW, introducing a collection of projects that underlined their collective idea of creating new ordinary objects from the recovery of waste materials.

Arco table lamp, for example, is made of “Wascoffe”, a material coming from coffee waste from the food chain Autogrill. The lamp is used without switches; its lighting and intensity regulation can be managed with the movement of one hand. The table lamp with its round arch makes a clear reference to Italian architecture and style. **Tomato homeware** is a set of kitchen objects such as plates and cutlery made out of bio-plastic and tomato peel waste coming from repurposed lands in Sicily. Every object is 100% Italian, natural and recyclable. In order to balance the impact of 3D printing production, they mix it with one of the oldest manufacturing practice: hand moulding and air drying.

LEARN MORE

www.pensieromateria.it | @pensieromateria

Photo Courtesy: Pensieromateria

PENSIEROMATERIA
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

Today, in a world where the actual demand for "product design" (that is, the one populated by the designer in the "classic" sense) has dropped dramatically, new designers are forced to go further. The comfort zones of the "product design" where the aesthetics and the market trend ruled, no longer exists. The design market is saturated in relation to the purchasing power of its own stakeholders and, as a consequence, also its associated labour market.

It seems that the unexplored areas where today's designers begin to move around are divided into two distinct dimensions: those related to the digital world in its forms, therefore these are associated with UX and UI design, and those that move further away from mass production and that look towards different consumer criteria that deal with sustainability. Sustainability, in its many forms, becomes a design logic for this class of designers that has clashed with the production and consumption system in vogue for more than a century and that has given, only in recent years, a clear sign of yielding releasing awareness and an urgent need for change. The role of designers today, and therefore also their challenge, is to build a bridge between the need to design, produce and consume with sustainable criteria and today's reality. In this way, designers stand out as innovators due to their tools. This step, which demands both time and urgency, takes place in different forms, such as creating awareness among consumers, conscious planning, the transition from industrial to artisan, etc. This new bet brings new opportunities that often make the designer no longer functional to the product but to the process.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Sustainability, and thus also circular design, become a lens for looking at one's work. Once these logics are embraced, it is difficult to take a step back having in mind how these principles can put a focus on the process rather than the product. This phase has become the new founding principle of our design, thus also directly affecting the aesthetics of the products we design. Everything becomes a single process where the aesthetic language merges with the supply chain that the product goes through until it reaches the final consumers with the aim to make them part of the process itself and beware of the what they have chosen.

From the beginning, we've decided to deal with a fundamental step of the product chain: the material. We are still working not only on creating products and objects but on materials that come from the logic of sustainability and circular design and can speak a language so strong that they become the main reason and identity behind their product.

We are still developing materials based on food chain waste, such as tomatoes, orange, blackberries, with the support of our technical partners. The goal is to offer these materials to our clients who create products that reflect a rapidly growing class of consumers who are sensitive to these issues.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

The big challenge we are daily facing is to manage the communication between different players of the supply chain. Simply put, the challenge is to manage the recovery of waste, which often follows the natural rhythms of seasonal production and the need for mass production methods that require a constant supply of materials. In addition to this, the enormous problem of disposal and the way it's managed with its national and international regulations still leaves too many questions unanswered. Global Sustainable Goals such as the Green Deal, often supported by Europe, frequently come to a halt due to many countries' bureaucratic issues, which as a result are not able to significantly pave the way for recovery processes and sustainable production. We live in a time of transition from the already existing mass production logics, a type of consumerism in its very first declining phase due to the increase of consumers awareness, to levels of disposability that are still far from being able to close the circularity loop. In this regard, it is not easy to imagine a future where the distribution of products and consumer goods made with methods and with natural resources follows natural/seasonal supply rates or a new market based on an awareness and established craftsmanship.

> "THE ROLE OF DESIGNERS TODAY, AND THEREFORE ALSO THEIR CHALLENGE, IS TO BUILD A BRIDGE BETWEEN THE NEED TO DESIGN, PRODUCE AND CONSUME WITH SUSTAINABLE CRITERIA AND TODAY'S REALITY. IN THIS WAY, DESIGNERS STAND OUT AS INNOVATORS DUE TO THEIR TOOLS."

/FORMAFANTASMA

ABOUT

Formafantasma is an Amsterdam-based design studio created by the Italian designer duo Andrea Trimarchi and Simone Farresin. The studio has developed a coherent body of work characterised by experimental material investigations and explored issues such as the relationship between tradition and local culture, critical approaches to sustainability and the significance of objects as cultural conduits

FEATURED PROJECT

Ore Streams is an investigation into the recycling of electronic waste. By using a diversity of media, Ore Streams reflects on how design can be an important agent for responsible use of resources.

For Ore Streams, Formafantasma designed a series of office furniture: chairs, desks, cabinets, and cubicles. The pieces are made of recycled iron, aluminium, dead stocks of computer cases and recycled electronic components. The outcome is very aesthetically pleasing and shows the intricate role design plays in transforming waste into desirable products.

LEARN MORE

www.formafantasma.com | @formafantasma

Photo by Ikon

FORMAFANTASMA
/ THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

There are different roles, and each designer should find their own. For sure, what we hope is that design will be more and more a discipline considered for its real potential and not only as a tool for styling and economic growth.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

We see sustainability as a chance to envision a different world, even if we prefer the word ecology. Sustainability is too often a word used by marketing to greenwash irresponsible production processes.

Within sustainability, we should all find a utopia to aim for. We are interested in sustainability as a chance to rethink the way we live on the planet. Actually, we prefer to think about ecology since sustainability is becoming more and more a marketing tool.

"WE ARE INTERESTED IN SUSTAINABILITY AS A CHANCE TO RETHINK THE WAY WE LIVE ON THE PLANET. ACTUALLY, WE PREFER TO THINK ABOUT ECOLOGY SINCE SUSTAINABILITY IS BECOMING MORE AND MORE A MARKETING TOOL."

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

There are several challenges. The first is that whatever we do as designers, product or service will most probably fulfil the dominant economic model based on growth. This is unsustainable. On the other side, we can infuse whatever we do with a thinking that might influence and help the development of a different culture. Education is also a way to go. Also, as designers, we can operate independently or on commission. Both approaches have limitations, but the best would be if as designers, we are challenged to think beyond the object and to think more about the context, process and consequences of what we do. The weak is the request from the commissioner, the weaker the result. A different design culture must grow.

/PHILLIP HAINKE

ABOUT

Philipp Hainke is a product designer that combines an artistic background with technical solutions. As a designer, he is involved in a continual process of observation and reflection to generate purposeful objects. He believes that these objects become part of our society and can have the power to effect it back.

FEATURED PROJECT

The project Organico utilizes traditional and renewable resources for the development of new, innovative material. An adhesive, composed of calcium hydroxide and casein, is used to press hemp fibres and shives into solid forms. Through extensive research, the optimal composition and structure were developed: a sandwich material with a cover of hemp fibre and a core of hemp shives, that is simultaneously stable and light. One of the pieces made with this material and coloured with natural pigments is the HALO chair, which won the second prize of the SaloneSatellite Award 2019.

LEARN MORE

www.philipphainke.de | @philipphainke

Photo Courtesy: Phillip Hainke

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PHILLIP HAINKE
/THOUGHTS WORTH SHARING

FOR YOU, WHAT IS THE ROLE OF A DESIGNER IN OUR CONTEMPORARY WORLD?

In my understanding, you could paraphrase the contemporary role of a designer as an active observer. Different to a passive observer which analyses and describes a situation, I would describe the active observer as one that analyses and acts. For me, design is the meeting point of social, technical and sustainable questions, and by this, a key element in our globalised world. As designers, we should be involved in a continual process of observation and reflection to generate purposeful objects.

I also see big potential in swarm intelligence as we see it now during the Corona crisis. Problems are made public, and thousands or even millions of individuals are processing these issues. I think everyone is creative because it's part of human nature, and I see much potential if we are able to focus this human resources to the significant global issues. And just to make this clear, I don't say that designers are not needed. I still think that we play an essential role in this game, but many other individuals do too, and everyone could benefit if they are involved on an eye level.

We as designers should not forget that we are always trying to think ahead, but we also have to spread our knowledge and enthusiasm and invite the society as a whole because it's the only way forward.

WHAT DO SUSTAINABILITY AND CIRCULAR DESIGN MEAN TO YOU? HOW IMPORTANT ARE THESE CONCEPTS TO YOUR WORK?

Clearly, an ecological approach is the most needed path in contemporary design. Since I grew up in the countryside, I've always had a strong connection with nature. Also, I spent one-year volunteering on an ecological farm before my studies which has left me with a lasting impression.

I genuinely believe that the objects we are creating become an active part of our society and can have the power to effect it back. In my project ORGANICO and the resulting HALO chair, I dedicated countless hours of work to develop a sustainable concept. A concept from which I knew that it would not have much of a chance in the real market. But I did it because I saw the need for a more ecological shift. I think you have to be kind of obsessed with an idea to invest so much in a project with an open end.

> "WE AS DESIGNERS SHOULD NOT FORGET THAT WE ARE ALWAYS TRYING TO THINK AHEAD, BUT WE ALSO HAVE TO SPREAD OUR KNOWLEDGE AND ENTHUSIASM AND INVITE THE SOCIETY AS A WHOLE BECAUSE IT'S THE ONLY WAY FORWARD."

Nowadays, I'm invited to give sustainable workshops or to discuss the problem of ecological questions with a broader audience. If my work inspires people and helps them to push green ideas forward, it was already worth the effort.

WHAT IS THE BIGGEST CHALLENGE DESIGNERS FACE IN ORDER TO BUILD A CIRCULAR FUTURE?

I need to admit that this is a hard one. I am a creative, a maker, and I am trained to develop, to process and to generate an outcome. More and more, I am struggling because I think we have to consider how necessary each project really is. This change won't happen within one year or two years, but in the long run, we have to reduce our hunger for resources and growth. It has to be way more important to work on lasting and repairable objects that can be disassembled and return in the circle.

I think the biggest challenge and a key element in a circular future is the acceptance of our mortality and that we are part of a bigger picture. For many years we saw ourselves on top of the food chain. We imagined this chain as a line from top to bottom, but I think we have to realise that this chain is interlinked and becomes a circle where each element plays an important role. Humans can't be on top, because after dying, we will be decomposed by the smallest players in that game, which are microbes, bacteria and insects.

Therefore we will all become part of the natural cycle. We can't afford to break any portion of this chain, and even if we are an essential part of it, we won't be able to survive its disruption.

/FINAL THOUGHTS

Our e-book was created and will be published during times of coronavirus quarantine. This crisis is definitely impacting our views on the environmental emergency, the linear economy and human interactions.

We strongly believe that we can learn greatly from any crisis as they push us to make sense of many issues. To help us all navigate through times of uncertainty, we want to finish this e-book with **Francesco Morace**'s wise words regarding the coronavirus outbreak.

"We have called it the virus of retaliation.
A virus that denies the tornado of opinions and enhances the truth of numbers.
A virus that defeats borders by showing that we are foreigners.
It improves the invisible in the age of visibility.
It threatens your breath by improving air quality.
It compels families back home by returning parents the role of educators.

A virus that vindicates the animal world by imposing the unexpected and ridicules people's opinion by improving the expertise of experts.
A virus that affects grandparents for the despair of their grandchildren and radicalises feelings by making collateral "affects" emerge.
A virus that penalises physical contact by demonstrating its irreplaceability and eliminates excesses by giving strength to the essentials.

A virus that favours smart working by recovering the role of relationships.
It eliminates male alibis by demonstrating the superior strength of the female.
It isolates people by indicating the need for reciprocity.
It dismantles sovereignty by feeding planetary consciousness.
I don't believe in biblical punishment, but Dante was a genius."

Francesco Morace - Italian sociologist, writer and President of Future Concept Lab

We hope you enjoyed the reading. Please feel free to share your thoughts with us on our social media or via email. We might not be able to get out physically from our homes and countries, but our minds can surely travel and still connect with each other.

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